

Twenty-third Annual Report

of the

MONTREAL NEUROLOGICAL INSTITUTE

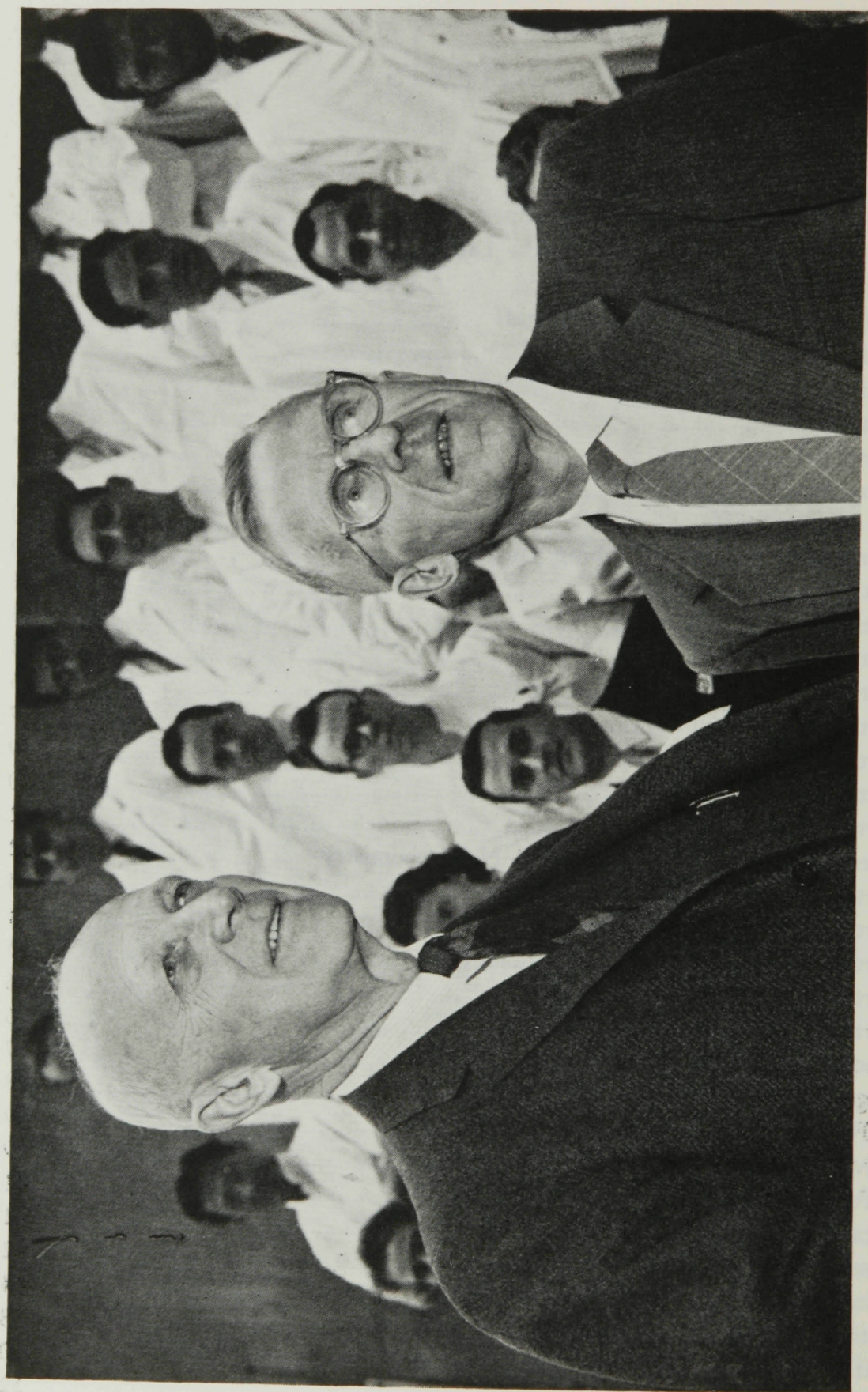
and the

DEPARTMENT OF NEUROLOGY
AND NEUROSURGERY

McGILL UNIVERSITY
1957-58

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Professor Wilder Penfield, Director of the Montreal Neurological Institute and Professor Donald Hebb, Chairman of the Department of Psychology, McGill University, at the time of the Annual Hughlings Jackson Memorial Lecture, 1958. Professor Hebb spoke on "Intelligence, Brain Function and Theory".

REPORT OF THE DIRECTOR

WILDER PENFIELD

This is the 23rd Annual Report of the Montreal Neurological Institute. It is a double report since the Institute houses a Hospital and a University Department which are completely separate as to budget. As always, our report is made directly to the Principal of McGill University. But, indirectly at this time, we are making a report to the Province of Quebec and the City of Montreal, since they contribute to our annual hospital costs.

We report also to the Canadian Government and to our other benefactors, in Canada and the United States, who support our scientific and academic work. These benefactors of science include private citizens and educational foundations. We report to the people in many parts of the world who send us patients, and to the hospitals that are so closely allied to us, and to medical workers everywhere who have come to expect scientific contributions from this Institute.

HOSPITALIZATION

Five great hospitals of Montreal, all affiliated with McGill University for teaching purposes, are embarking on a campaign for funds next week. We wish them well. Surely they will succeed. Success in such a cause is the best proof that the citizens of this Democracy are worthy of their freedom. There are no such campaigns in Communist countries. This Institute is also a teaching hospital. But we are not included in the present appeal for funds since we have already completed the re-organization which was inevitable after the war.

The addition to the original Institute building, called the J. W. McConnell Wing, was undertaken only after we had received Mr. Duplessis' promise that the Province would more than double the annual grant for hospitalization which the Institute had from the beginning. The additional space, thus provided, made possible a better distribution of public and private accommodation, and complete re-organization of our business methods.

We had promised that this would reduce our hospitalization deficits. At last it appears that we can make good that promise. This year, I am told, the annual hospitalization grant from Province and City will cover the patient deficit—almost!

TEAMWORK

Our sub-departments have multiplied marvellously during the 23 years and six months that have elapsed since our doors first swung open. Specialization makes progress possible. It makes teamwork necessary. But in the teamwork of an institution, workers need not, and must not, lose the personal touch. Compassion for human suffering is the urge that gives birth to hospitals such as ours.

Compassion grows stronger in the heart when it is shared by many. Zest for exploration, too, grows keener in the mind when one scientist knows that there are others down the hall working with him into the silence of the night, each with a clue to something new.

Because of their progressive specialization—economic, professional, clinical, academic or scientific—the members of our Institute team now speak with greater authority than I, in some area of effort. Once I spoke for all, but not now. You have heard from a few. I wish there were time for all to speak, as they should.

HIGHER EDUCATION

Let me, therefore, take the distant view, see this Institute against the background of the nation, as one of the institutions of higher learning. Seen thus, the importance of the Montreal Neurological Institute depends not so much upon the lives that are saved here nor upon the pain relieved, important though these things may be. Its greatest value to the country and to the future lies in the role it plays in the field of education, in brain research, in the training of the experts who will go elsewhere.

Our problem then is the problem of institutions devoted to higher education. Our most important teaching is that of graduate students. These men, during the years spent here, carry out much of the research for us, under our direction.

The Fellows' Society, organized by these men, holds its own annual meeting at the close of the academic year. Their President, Ellis Keener, has asked some of us permanent members of the staff to come to their meeting to predict for them significant areas of neurological research during the next 20 years.

They are carefully selected scholars, expert technicians prepared to take up their life's work. Some will found university or hospital units of their own. They are laying plans, as I did at the same age, wondering what role to play in the neurological research of the next generation. They will secure research grants no doubt from some government or foundation, or patient, perhaps.

But institutes like this one, and nations too, must take a longer view, must plan for centuries of peace. Although we know that two great nations now possess the power to destroy this civilization, we must not be defeatists.

Instead, let us be steadfast, courageous, patient, wise—and pray that madness will not take control in some far off capital. The best educated, and the best trained nation is the strongest and the happiest, the best able to defend itself and to realize its own potential. Then let us turn to look at education in Canada, especially higher education and research.

There is a stalemate in Canadian education. The Province of Quebec has returned University grants from the Canadian Government. The Provinces claim prior responsibility in regard to education. Let us agree that they are right. Let us agree that the actual terms of Confederation should be respected on this point.

What now? Are institutions of higher learning to waste away while discussions of political advantage are carried out? Must research stop? Should graduate students stop their work and go abroad?

There is a partial compromise that might in the long run, if wisely elaborated, prove most satisfactory. It should be clearly recognized that uncertain annual grants, which are subject to political whim, constitute the least desirable of all means of University support. Nevertheless, it must be admitted that a little bread, however uncertain the delivery may be, and regardless of what bakery it comes from, is better than to be forever hungry!

ENDOWMENT OF RESEARCH

The compromise is this. Let the National Government rescue research in this country. If this is done in the most effective manner, there will be no interference with Provincial plans for education. On the contrary, it will fertilize educational growth as never before.

Research is a field in which the Provinces take little interest, if one may judge by contributions arising in educational departments. It is a field in which the National Government has made a promising beginning by the establishment of the National Research Council and the Canada Council.

Research is of paramount importance today. It should be planned strategically. Some of the work can be done best in one province, some in another, but research benefits the whole country inevitably. Perhaps our National Government might learn from the experience of great educational Foundations such as the Rockefeller and the Nuffield, or from great private benefactors of education, such as J. W. McConnell. Their purpose has been to support strategic work temporarily and then to help launch the work on a permanent basis by endowment grants.

This is a field in which I have had a specialized experience! One in which I have not always been successful. Dr. Rasmussen spoke of our need for a major fund to support graduate research fellows. I've hoped for this for 15 years in vain.

But consider the past history of this Institute. From the Rockefeller Foundation came grants for our research; then, after 2 years, half the cost of the original building and an initial scientific endowment of one million dollars. That created this Institute. We were then in a position to secure permanent staff and lay our plans.

Today, from the Federal Government in Ottawa we receive \$48,500 as a "block grant" for research each year, through the National Research Council. This we have had for 11 years. Fortunately, it made it possible for us to avoid retrenchment of our scientific activities following the war. But the grant is made out to me as an individual. It may be revoked any time, and I may be killed in Montreal traffic tomorrow.

This country will have need for brain research for centuries. An endowment of a million and a quarter dollars was our original appeal to the Prime Minister, Mr. King, at the end of the war. It would give the same income.

This is our appeal today to the present Prime Minister in Ottawa. Endowment costs so much less, in the end, yields so much more to higher education. A Federal University Grants Commission established with wise terms of reference might supplement the educational work of the Provinces smoothly, give us permanence without patronage.

GRADUATE STUDIES AND RESEARCH

DR. HERBERT JASPER

A review of research activities in the various laboratories of the Institute during the past year gives the impression of steady progress in both clinical and basic research, but without sensational advance in any particular field.

In neurochemistry Dr. Elliott and his team have continued an active and varied programme of research on both functional and metabolic chemistry of brain and nerve tissue. Amino acids, acetylcholine, brain electrolytes, enzymes and energy metabolism have all received particular study with significant advance in each. Much ground has been cleared but no major break through has been achieved. Basic mechanisms of excitation and inhibition and the old problem of the chemical mechanisms of epileptic discharge remain still as puzzling as ever.

In neurophysiology, microelectrodes have been used extensively to record the discharge of single nerve cells in the depths of the cortex and hippocampus in relation to the electrical activity in dendrites of the type which makes up most of the waves seen in the electroencephalogram. Mechanisms of excitation and inhibition and of epileptic discharge have been clarified, and neurophysiological correlates of attentive behaviour and learning have received intensive study. The results are fascinating and force one to reconsider many accepted viewpoints, though in most respects they are too complex to permit satisfactory explanation as yet. Of special interest have been studies of the importance of the hippocampus in learning and memory processes, though here again the mechanisms are a complete mystery.

Careful work has begun on the physio-pathology and surgical treatment of Paralysis Agitans and related diseases of the basal ganglia. Studies of hypothermia as affecting brain damage following vascular occlusion are being continued. Other centers have made much further advance in these important new developments in neurosurgery.

In neuroanatomy, it is being demonstrated that we can still learn a great deal by the use of traditional techniques, especially in the hands of old masters like Dr. Klingler. The most exciting developments in this field are being made by electron microscopy, tissue culture, radioautography and histochemistry, none of which is being done in our laboratories.

In anaesthesia, new anaesthetic and analgesic agents are under continued study but work on mechanisms of action has not yet begun. Quantitative studies of adrenaline and noradrenaline secretion in relation to surgical shock is yielding interesting though puzzling results.

In neuropathology much has been accomplished in putting our house in order and in presenting stimulating clinico-pathological conferences. New techniques and ideas will have to be introduced before major advances can be expected in this field. This applies also to our investigations of multiple sclerosis.

Psychological studies of higher mental functions in relation to brain lesions in epileptic patients are continuing to produce results of increasing importance with regard to functional localization within the brain. Continuation of Dr. Penfield's classical studies on cerebral localization, for which this Institute is most renowned, is bearing additional fruit, as exemplified by a new book soon to appear with Dr. Roberts on SPEECH MECHANISMS AND THE LEARNING OF LANGUAGE. But where do we go from here? Knowledge of the more intimate mechanisms of the brain in the elaboration of such complex functions as speech and language awaits new conceptions of dynamic organization with the application of techniques yet to be developed, probably with the aid of communication engineers and other physical scientists.

Some may suspect that this report has been written under the shadow of the Sputniks. But these are long considered opinions. We do need a Sputnik now and then to keep us from resting upon past laurels.

I believe that we have reached a critical stage in the research activities of this greater Institute. We are much bigger and better equipped but are we not sacrificing quality and originality for quantity. There is no lack of conscientious effort, but too little time for creative work.

There is also a serious lack of men with adequate basic scientific training. For example there is no fellow of the Institute working in our department of Neurochemistry. Our biophysicist has sought greener pastures below the border and has not been replaced. Much of our research must be carried on by fellows whose basic training has not prepared them to undertake significant investigations with the more advanced methods required in neurological research today.

We are not alone with this problem. We share it with thoughtful educators and scientists throughout the country. Let us face it squarely while there is still time to revive the research activities of this Institute to keep pace with the rapid advance of the physical sciences and their increasing application to our field of endeavour.

The problems of brain function are still more challenging than those of outer space, and of more immediate importance to the welfare of mankind. We need a clear vision of the present and future to live up to the traditions of the past.

TEACHING AND THE LABORATORIES

DR. THEODORE RASMUSSEN

We are listed in the McGill Calendar as the Department of Neurology and Neurosurgery. Attention should be drawn, however, to the fact that this is a unique Department, unique among the departments of the Medical Faculty at McGill, and unique among departments of Neurology and Neurosurgery of other North American universities. I refer particularly to the fact that, in addition to the multi-discipline research program that justifies the title of Institute, we have major teaching responsibilities, both in preclinical and in clinical subjects at both the undergraduate and graduate levels. In the first

half of the medical course, in collaboration with the Departments of Anatomy, Physiology and Pathology, we carry out the teaching of neuroanatomy, neurophysiology and neuropathology. In the second half of the medical curriculum, as indicated by our official university title, we teach the diagnostic and therapeutic principles concerned in the care of patients suffering from disease of the nervous system. We have, therefore, been involved in all phases of the activities of the Curriculum Committee since it began its exhaustive study of medical curricula in general and the McGill medical curriculum in particular, some 2½ years ago.

During the past year the Curriculum Committee, despite signs of fatigue and creaking of the joints, has agreed on definite conclusions regarding recommendations to strengthen and modernize our Medical School teaching program. The final report of the Committee is being prepared and, it is anticipated, will be ready for presentation to the Medical Faculty early this fall.

The proposed alterations in the first and second, or preclinical years, will not result in any very drastic changes in the activities of our Department. Considerable changes are in the offing, however, for the third and fourth, or clinical years. Replacing the present scattering of hourly lectures and clinical demonstrations, a block of time will be allotted to the third year medical student, during which he will concentrate for half of each day on clinical aspects of the nervous system. The students will rotate through the Institute in small groups, making possible much greater opportunity for active, as opposed to passive learning by the student, as well as more extensive staff-student contact. This proposed curriculum change will also increase the opportunity for the senior residents and junior staff members to take part in the teaching program. The student will get a glimpse into the workings of the Institute, that we hope will illustrate the close interplay between clinical and basic research that is the essential element of today's accelerating progress in Medicine.

Plans for the fourth year teaching program involve more extensive use of the out-patient clinics, and increased integration of the specialties into the framework of general medicine. The organization of this part of the program at the Montreal General Hospital presents no major mechanical problems, but, for the immediate future at least, space limitations will impose considerable handicaps in the working out of Royal Victoria Hospital half of this program.

I feel sure the net result of the proposed curriculum changes will be more efficient teaching by the staff, more effective learning by the student, yielding at the end of the 4th year medical course, young physicians better qualified to enter, via the internship, upon the life-long post-graduate course of instruction provided by the patient and his illness.

At the graduate level, our teaching program has followed the general pattern of previous years. The Fellowship and Resident staff, 35 in number equalled in size our largest groups of recent years. One third are from Canada, one third from the United States, and the remaining third have come from 8 other countries around the globe. In addition, Residents have been assigned on

rotation from the Montreal General and Royal Victoria Hospitals for training on the neurological services, and in the Departments of Anesthesiology and Neuroradiology.

Dr. Jasper has outlined the principal activities of the Institute's five research laboratories. It should be emphasized that these investigative programs also constitute one of our most important and most effective teaching areas. Unfortunately, the combination of rigidly outlined training requirements of the various specialty Certifying Boards, and the hard realities of economics all too often prevent the clinician in training from getting more than minimum contact with the spirit of inquiry and discipline of the laboratory. This is a chronic problem for which no easy solutions are available at present.

Dr. Gilbert's appointment as Chairman of the McGill Department of Anesthesia emphasizes the growth in stature of our Anesthesia Department. I often think this name poorly describes the range of their responsibilities; oxygen therapy, safeguarding airways of unconscious patients, hypothermia, hypotension, insertion of needles in vessels and nerves the rest of us can't find, adjustment of operating room lights for impatient surgeons, positioning of patients on operating room tables, running emergency errands for harassed operating room nurses, as well as providing the boon of safe, skilful anesthesia during long, increasingly complex, and often hazardous surgical procedures. We welcome back Dr. Brindle to his post as Assistant Anesthetist after a year's leave of absence for study in the Department of Medicine of the Royal Victoria Hospital.

Dr. Gordon Mathieson returned last September to assume direction of the Laboratory of Medical Neuropathology and the teaching of neuropathology. Dr. Gardner McMillan, Strathcona Professor and Director of the Pathological Institute, has recently accepted the post of Consulting Pathologist to the Institute, formerly held by the late Dr. Lyman Duff.

Under the heading of graduate teaching, special mention should be made of the valuable and popular course in advanced brain dissection given by Visiting Professor Klinger of the University of Basel, Switzerland. Of particular interest also, was the visit this past winter of Dr. Zemskaya and Dr. Savshenko, neurosurgeons from the Leningrad Neurosurgical Institute, who came through the increasingly porous Iron Curtain to study our neurosurgical methods and techniques.

A generous Dominion-Provincial Hospital Equipment Grant this year again helped remedy the obsolescence that nowadays overtakes both laboratory and hospital equipment long before it wears out. These grants have been of the greatest importance, both to the hospital and the laboratory divisions of the Institute. We have no assurance, however, that these grants will be continued during the coming years. If not, a considerable increase in income will be needed to provide this equipment in future years.

Again this year, as in recent years, a considerable proportion of the research program of the Institute has been financed by the "soft" money of yearly grants for specific projects. The slow but steady shrinkage of the buying power of the "hard" money income from endowment, and the "not-quite-so-hard" money of

the yearly Federal Consolidate Grant, is gradually increasing our dependence on these project grants. This dependence must be lessened if we are to ensure permanence and strength in our research program, basic and clinical. Thus, the plea for more endowment remains a recurring theme in these annual reports.

As we near the quarter century post of the Institute's existence, the recent meeting in Brussels of the First International Congress of the Neurological Sciences incidentally provided a glimpse of the breadth of the Institute's contributions to this broad field. We will need to make wise decisions, work industriously, and be blessed with luck if we are to equal the record during the second quarter century ahead.

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.C.S., F.R.S. (London), Hon. F.R.C.P. (Eng.)

Neurologist-in-Chief

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

Neurologist

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

Associate Neurologists

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

Neurosurgeon-in-Chief

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

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Associate Neurosurgeons

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Roentgenologist

DONALD McRAE, M.D.

Electroencephalographer

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

Associate Electroencephalographer

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

Anaesthetist

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

Associate Anaesthetist

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

Assistant Anaesthetist

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

Neurochemist and Donner Fellow

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

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

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

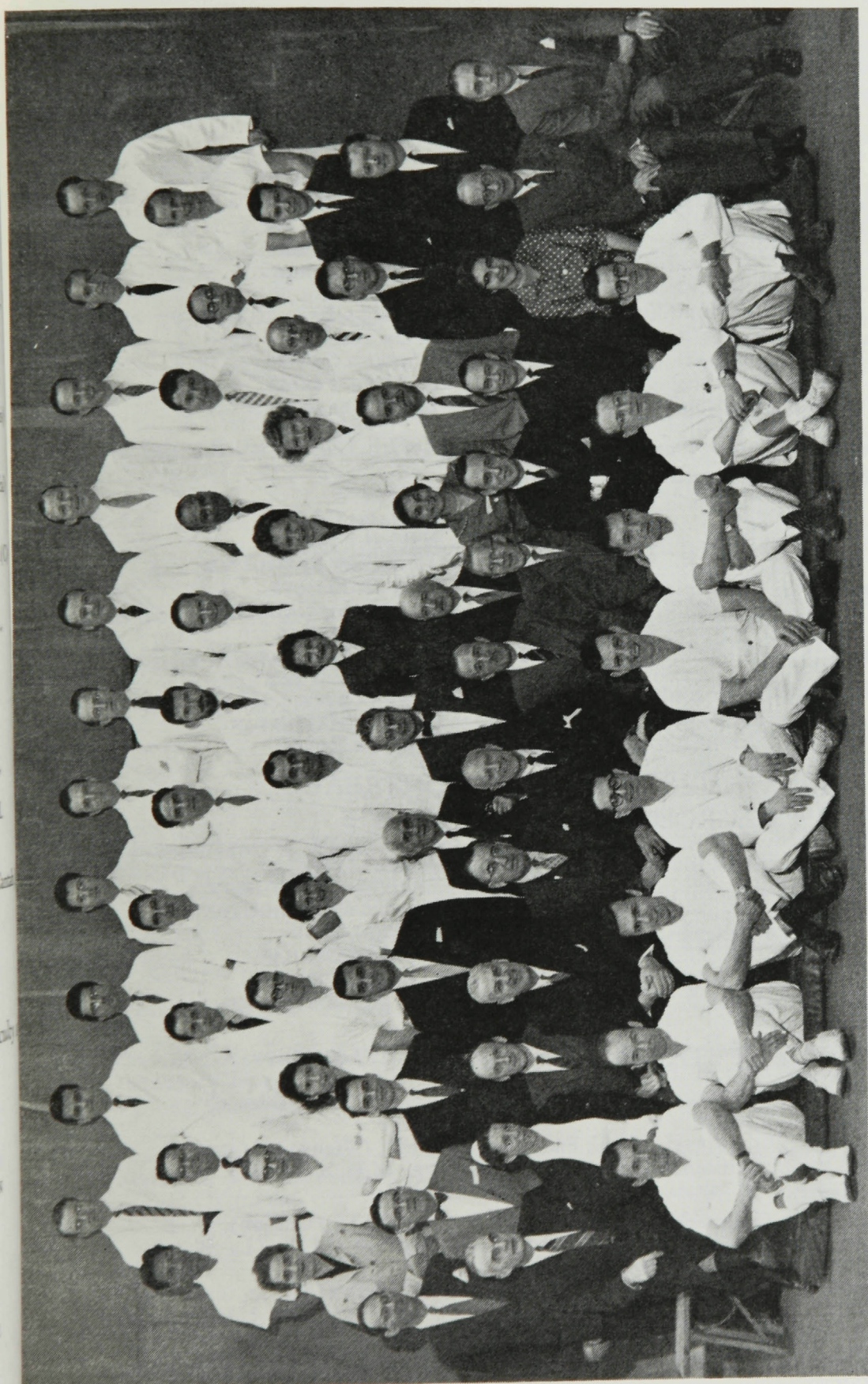
CONSULTING AND ADJUNCT CLINICAL STAFF

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Consulting Psychiatrists	D. EWAN CAMERON, M.D., F.R.C.P.(C) MIGUEL PRADOS, M.D.
Consulting Neurologist	ROMA AMYOT, B.A., M.D., (Montréal and Paris) SYLVIA CARON, M.D., F.R.C.P.(C) JEAN SAUCIER, B.A., M.D., (Paris and Montréal) NORMAN VINER, B.A., M.D., C.M. JEAN-LÉON DESROCHERS, M.D.
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TEACHING STAFF

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Chairman of Department	WILDER PENFIELD
Professor of Neurology and Neurosurgery	THEODORE RASMUSSEN
Professor of Neurosurgery	WILLIAM CONE
Professor of Experimental Neurology	HERBERT JASPER
Associate Professor of Neurology	FRANCIS MCNAUGHTON
Associate Professor of Experimental Neurology	K. A. C. ELLIOTT
Associate Professor of Neurological Radiology	DONALD McRAE
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Assistant Professors of Neurosurgery	ARTHUR ELVIDGE HAROLD ELLIOTT



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 D. THOMPSON; G. MATHIESON; G. BERTRAND.
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Assistant Professor of Neuropathology	GORDON MATHIESON
Assistant Professor of Experimental Neurology	PIERRE GLOOR
Lecturers in Neurology	BERNARD GRAHAM
	D. HOWELL
	REUBEN RABINOVITCH
Lecturers in Neurosurgery	LAMAR ROBERTS
	(Reford Fellow)
	GILLES BERTRAND
Lecturer in Experimental Neurology	HANNA PAPPIUS
Lecturer in Clinical Psychology	BRENDA MILNER
Demonstrator in Neurology	IRVING HELLER
	ALLAN MORTON
	ANTONIO AGUILAR
	CHARLES BRANCH
Demonstrators in Neurosurgery	ELLIS KEENER
Demonstrator in Neuropathology	WARREN SIGHTS
	ANTONE TARAZI
Demonstrator in Electroencephalography	LEWIS HENDERSON

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

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(Chairman)	HERBERT JASPER
	THEODORE RASMUSSEN
Associate Professors	K. A. C. ELLIOTT
	FRANCIS MCNAUGHTON
	DONALD McRAE
Assistant Professors	J. B. R. COSGROVE
	ARTHUR ELVIDGE
	PIERRE GLOOR
	GORDON MATHIESON
	PRESTON ROBB

EXECUTIVE STAFF OF THE MONTREAL NEUROLOGICAL INSTITUTE

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

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Senior Resident	WARREN SIGHTS, M.D. (Chicago)
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A. TARAZI*, M.D. (Beirut) Lebanon	Argentina
K. KITAMURA*, M.D. (Kyushu) Japan,	C. VERA*, M.D. (Chile),
Rockefeller Fellow.	Rockefeller Fellow
C. J. SHIH*, M.B. (Taiwan), Fellow,	E. KEENER*, M.D. (Emory)
China Med. Board of N.Y.	W. BRYANS*, M.S., M.D. (Colorado)

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Residents	ARTHUR HOUSE, M.D. (Dalhousie),
	DANICA VENECEK, M.D. (Prague)
	Czechoslovakia
Assistant Residents	
F. ANDERMAN, M.D. (McGill)	K. KAPPAH, M.D. (Washington)
M. J. FINA, M.D. (Albany)	V. R. GULATI*, M.B.B.S. (Punjab)
P. MLYNARYK†, M.D.	India, Colombia Plan Fellow
J. W. ENSINCK†	J. JANE†
S. HALLE†	S. KENNING‡
G. HEUSER†	G. BRINDLE†
H. DESJARDINS†	A. HOOD†
J. CAESAR‡	R. POWER‡
P. I. REED‡	K. DRUMMOND‡
S. FYLES, M.D. (Queens)	J. SUTHERLAND‡

LABORATORY DEPARTMENTS

ELECTROENCEPHALOGRAPHY AND ELECTROMYOGRAPHY

Electroencephalographer	HERBERT JASPER, Ph.D., D.es Sci. (Paris),
	M.D., C.M.
Assistant Electroencephalographer	PIERRE GLOOR, M.D. (Basle) Switzerland,
	Ph.D.
Electroencephalographic Fellows	MARY MORROW, M.D. (McGill)
	S. N. RAY, L.M.F., M.Sc., (Calcutta) India
	ARMAND FORTIN, M.D. (Univ. Montreal)
	DAVID BLOOM*, M.D. (Cornell)
	ELLIS KEENER*, M.D. (Emory)
	ANTONE TARAZI*, M.D. (Beirut) Lebanon
Electromyographic Fellow	S. YAMAMOTO, M.D. (Kanazawa) Japan
Chief Technician and Demonstrator	LEWIS HENDERSON

EXPERIMENTAL NEUROCHEMISTRY

Neurochemist and Donner Fellow	K. A. C. ELLIOTT, M.Sc., Ph.D., Sc.D.
	(Cantab.)
Associate Neurochemist	HANNA M. PAPPUS, M.Sc., Ph.D. (McGill)
Assistant Clinical Neurochemist	IRVING H. HELLER, M.D., M.Sc. (McGill)
Visiting Scientist Fellow	FRANZ HOBBERGER, M.D., (Vienna), Ph.D.
	(London)
Research Assistant	SIGURD HESSE
Residents in Anaesthesia	I. HILDEBRANDE,
E. OSMOLSKI,	E. WYNANDS,
J. HEMSTOCK,	A. GAGLIANO

*Six months on this service

†On rotation from Royal Victoria Hospital

‡On rotation from Montreal General Hospital

NEUROANATOMY AND MEDICAL NEUROPATHOLOGY

Neuropathologist	GORDON MATHIESON, M.B., Ch.B. (Aberdeen) Scotland
Visiting Professor	JOSEPH KLINGLER, M.D. (Basle) Switzerland MARY JANE AGUILAR, M.D. (Colorado)
Fellows	ENRIQUE RAMON MOLINER, M.D. (Madrid) Spain, Can. Nat. Research Council Fellow ALLAN MORTON, M.D. (McGill) WILLIAM BRYANS, M.S., M.D. (Colorado)
Chief Technician	BARBARA NUTTALL

NEUROPHYSIOLOGY

Neurophysiologist	HERBERT JASPER, Ph.D., D.es. Sci. (Paris), M.D., C.M.
Fellows	GABRIEL HOW, M.D. CHARLES BRANCH*, M.D., (Vanderbilt) JOHN BLUNDELL, M.B.B.C. (London) SALVADOR GONZALEZ, Ph.D. (Guadalajara) Mexico JAN GYBELS*, M.D. (Louvain) Belgium
Electronic Engineer	ROBERT NAGLER

PHOTOGRAPHY

Supervisor	GILLES BERTRAND, B.A., M.D. (Montreal) M.Sc. (McGill)
Photographer	CHARLES HODGE
Assistant Photographer	VINCENT TAYLOR

RESEARCH IN MULTIPLE SCLEROSIS

Chief	JAMES B. R. COSGROVE, M.D. (Man.) M.Sc. (Cantab.)
Chemist	PAMELA AGIUS, B.Sc.
Technician	MRS. EVA MEHLHOSE

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)
Senior Neuropathological Fellow	GORDON THOMPSON, M.D. (McGill)
Neuropathological Fellows	JOHN KENNADY, M.D. (Iowa) HUGH SAMSON, M.D. (Western Ontario) PHANOR PEROT*, M.D. (Tulane) CHRISTIAN VERA*, M.D. (Chile), Rockefeller Fellow KITSUTOSKI KITAMURA*, M.D. (Kyushu) Japan, Rockefeller Fellow DANIEL GONZALEZ*, M.D. (National Univ.) Mexico
Chief Technician	JOHN GILBERT

*Six months on this service.



Bottom Row: G. NAKASH (3N); B. BUDGELL (2N); M. SHAW (2N); E. ADAM (2S); L. HARRIS (2S).
 Second Row: E. CARMAN; D. HALL; B. CAMERON; E. FLANAGAN; A. JOHNSON; P. STANLEY (OR); A. KIMBERLEY (3S).
 Third Row: C. ROBERTSON (2E); S. WALKER (3N); J. EMMS (3N); A. ARASON (3N); J. MALLORY (3N); E. ROPAR; (3S); M. MANCHEN (2E).
 Fourth Row: N. FERGUS (3S); M. LAROSE (3S); A. CAMERON (4S); R. DICKSON (2S); L. KANE (3N); M. AGNEW (3S);
 Top Row: N. SIDDONS-GREY (4N); P. MURRAY (OR); G. MORIN (4S); I. MACMILLAN (4N); J. BAYLISS (2S); P. MENDOZA J. A. MACMILLAN (OR); G. JOTIC (2N); M. POOLE (3N).

NURSING STAFF

<i>Director of Nursing</i>	MISS EILEEN C. FLANAGAN, B.A., R.N.
<i>Assistant Director of Nursing</i>	MISS BERTHA CAMERON, R.N.
<i>Administrative Assistant</i>	MRS. ELEANOR CARMEN, R.N.
<i>Supervisor Dressing Rooms</i>	MISS ANNIE JOHNSON, R.N.
<i>Educational Director</i>	MISS LOUISE HALL, R.N.
<i>Night Supervisor</i>	MISS ELIZABETH BARROWMAN, R.N.
<i>Assistant Night Supervisors</i>	MISS LILLIAN MCAULEY, R.N. MISS PAMELA HARRISON, R.N.
<i>Operating Room Supervisor</i>	MISS PHOEBE STANLEY, R.N.
<i>Assistant Operating Room Supervisor</i>	MISS PATRICIA MURRAY, R.N.

HEAD NURSES

MISS MARY CAVANAUGH, R.N.	MRS. GEORGETTE KANE, R.N.
MISS ALICE CAMERON, R.N.	MRS. GEORGETTE JOTIC, R.N.
MISS CAROLINE ROBERTSON, R.N.	MISS AUDREY KIMBERLEY, R.N.
MISS LENORE KANE, R.N.	MISS KATHLEEN FARRELL, R.N.

SOCIAL SERVICE STAFF

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

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

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

MONTREAL GENERAL HOSPITAL

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

MONTREAL CHILDREN'S HOSPITAL

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

REPORT OF THE NEUROLOGIST

DR. FRANCIS McNAUGHTON

It is fitting that this review of the year's work should begin with the Departments of Neurology and Neurosurgery. It is primarily the care we give patients suffering with disorders and diseases of the Nervous System which justifies our place in the Community as a Clinical Institute.

The Neurological Department can report a successful year, in terms of an increase in the number of patients treated. We have tried to give our patients the best medical care in the world, though there have undoubtedly been many occasions when we have fallen far short of the ideal. If there is any one factor tending to lower our standard of care, it is the lack of time in this busy place for careful, thoughtful and kindly study of individual patients. We must reorganize our work that there is plenty of time for the patients. If we fail in this respect, all our impressive laboratory tests will be of no real use.

Particular note should be made of the work of the Seizure Clinic, which we maintain in the Royal Victoria Hospital, with the support of a Rehabilitation Grant from the Federal and Provincial authorities. This Clinic has now grown to a point where it will require reorganization, if it is to function at its best. In addition to providing medical and social care for patients with Epilepsy, it serves as a centre for Clinical Training of Residents and Fellows—in close liaison with Dr. Jasper's E.E.G. Department. Dr. Herbert Martin and Dr. Antonio Aguilar have been carrying on Clinical research with several new anti-epileptic drugs, and are studying the gum hypertrophy produced in some patients by Dilantin. Dr. Shirley Ferguson has given valuable service as Psychiatric Consultant, and has directed discussion groups for patients and their relatives, which we hope to continue next year. We regret that she will be leaving us in June.

We have kept a close relationship with Dieppe House, through its capable director, Major Bonhomme, and the many patients who attend our Clinic. Recently, Dr. Bernard Graham of our staff, has been appointed as Neurological Consultant to Dieppe House, and I am certain that this appointment will bring us even closer together.

Our other special Clinic, for patients with Multiple Sclerosis directed by Dr. Cosgrove, continues to grow in size and importance. Through this Clinic some 300 patients receive care and supervision and participate in Dr. Cosgrove's research program. Outside financial support is now being sought, to broaden the work of this Clinic.

A year ago, we announced the U.S. Public Health Training Grant in Neurology. In addition to supporting citizens of the United States who are receiving Neurological Training here, this Grant has helped us to strengthen and enlarge our facilities for training in Neurology. While every department in the Institute contributes to the training of our Fellows, I wish to make particular mention of Donald McRae's teaching in Radiology, and Gordon Mathieson's Conferences in Neuropathology—which have been outstanding.

Dr. Sean Murphy of the Department of Ophthalmology is now giving special teaching in Neuro-ophthalmology, and Dr. Miguel Prados of the A.M.I. is to begin regular conferences in Psychiatry, for the benefit of the house staff and Fellows.

During the past year, we have been able to invite outstanding neurologists to lecture and conduct teaching rounds at the Institute for several days at a time. These occasions have been stimulating and helpful for all of us, senior and junior, and we hope to make them a regular part of teaching activities. This year we had such visits from Dr. Gilbert Glaser of New Haven, and Dr. Paul Castaigne of Paris. We have just concluded a pleasant week of teaching by Dr. J. Purdon Martin, Senior Physician at the National Hospital, Queen Square, London—the Shrine of British Neurology.

REPORT OF THE NEUROSURGEON

DR. WILLIAM CONE

The patients admitted to the Neurosurgical Service in 1957 totalled 1336. Patients have always expressed their appreciation of the unusual care and supervision they receive here. This past year even more have recognized and spoken of their good management. Dean Lloyd Stevenson stated in his annual report of the Faculty of Medicine of McGill University for 1956-57 that "the best cared for patient anywhere is the patient in the university teaching hospital where highly qualified physician-teachers instruct doctors of tomorrow, and where laboratories and clinics carry forward active investigation of the ways of disease." With the help of the special scientific services and laboratory services in the Institute, and with the facilities for research, the Neurosurgical Department and Nursing Staff are well prepared to carry out the diagnostic, treatment, teaching, and research programs Dean Stevenson outlines. And the patients are cared for splendidly. Dr. Warren Sights, Senior Resident, and Dr. Richard Lende and Dr. Emil Berger, Residents, have worked hard and run their respective services well. With more help the discharge summaries would have been available more promptly, and there would have been more time for recording and research on the "ways of the patient's disease."

In the Neurosurgical Outpatient Clinics there were 930 outpatient visits. Dr. Elvidge and his staff held the Clinic for the Third Neurosurgical Service on Tuesday afternoon. Dr. Roberts and the Resident Staff of the Second Neurosurgical Service conducted a Wednesday afternoon clinic. Dr. Cone and Dr. Bertrand and the Resident Staff of the First Neurosurgical Service conducted their clinic on Friday afternoon. The help of the Social Service Department and Miss Margaret Gurd, acting as clinic secretary, has done much to make these clinics run smoothly. We are particularly indebted to Miss Gurd for the kindly way she guides patients through the clinics.

Of the 866 operations carried out in 1957, 217 were osteoplastic craniotomies; 74 were trephinations; 261 were operations on the vertebral column for spinal cord or cauda equina lesions; and others, not easily classifiable, were nevertheless major procedures.

In but 4 of the 866 operations were there operative infections. The infection rate is thus 0.046%, an unbelievably low one. These figures prove that Miss Stanley and her staff are almost, though not quite perfect. We thank them for their skilful support.

In 1956 the number of formal operations was 48 more than in 1957. The explanation for this is that more and more surgical procedures, formerly done in the operating room, are carried out in the ward dressing rooms, and are not entered in the operating room book. They are not all minor procedures. They can be done in the ward dressing room as part of the ward routine because of the splendid set-up planned and maintained by Miss Bertha Cameron, and Miss Flanagan's well trained nursing staff on the ward, make it feasible. Procedures commonly carried out are twist drill holes for ventricular puncture. Biopsy for tumor is frequently done. Brain abscess is often verified and treated. Subdural hematomas are proven and drained. Ventriculograms are done. Skull tongs are applied for cervical traction. Tracheotomies are carried out. Lacerated wounds of the scalp are sutured. These procedures are usually emergency ones. Experience has proven they can be as safely carried out here as in the operating room. The rapidity with which treatment can be constituted has saved lives. The experience and understanding the ward staff gains from the work in the dressing rooms make the routine care of the patient better and more interesting.

Last year Dr. McNaughton noted, "Arresting new developments in the clinical field do not come as often as we would like, but I trust each year brings a quiet accumulation of experience for those who labour here." No arresting new developments can be claimed for the work of the year, but we can point out refinements in surgical technique, refinements in the treatment of brain abscess, of meningitis, in the management of wounds, in postoperative care, all of which is a "quiet accumulation of experience" for the benefit of all patients referred to any of the three neurosurgical services, and of course, especially for those patients transferred from Medical Neurology.

REPORT OF THE ASSISTANT DIRECTOR HOSPITALIZATION

DR. PRESTON ROBB

It is a pleasure to report the progress that has been made during the past year in the activities and administration of the clinical services of the Institute. At the same time I want to point out some of the areas which continue to cause anxiety.

Hospital Statistics

In 1957 there were 2,531 patients admitted as compared to 2,540 in 1956. The total number of hospital days was 41,094, a decrease of 3,863 over the previous year. This decrease is mostly due to a rather remarkable fall in patient load during the summer months. There does not seem to be any way that one can predict what the occupancy will be. During March of 1958 occupancy

fell to about 78%, a very unusual low for this time of year. Then suddenly it rose to over 100% and all of the services were strained to the breaking point. The average daily bed occupancy for the year 1957 was 82.7%. The average length of stay was 16.1 days. It is to be noted that the average stay in 1955 was 19 days, in 1956 it was 17.7 days. The continued fall is a tribute to the hard work of everybody in seeing that no time is wasted in the investigation and treatment of patients. There were 105 deaths and a very commendable autopsy rate of 87.6%. There were 866 surgical procedures, some 48 less than the previous year.

Although the ratio of private and semi private to ward patients has improved, the number of indigent patients has increased far beyond our expectation. The Q.P.C.A. rates have increased, however they are still far below the theoretical formula where the provincial government pays a third, the community pays a third and the hospital pays the rest. With the average daily cost running over \$28.50 a day, the hospital receiving \$10.50, it means that we must pay well over half the cost. There is also an increasing number of patients who are not eligible for Q.P.C.A., yet the nature of their illness makes it impossible for them ever to pay their account.

The neurology and neurosurgical out-patient clinics, operated by the Royal Victoria Hospital have increased their activity. The total number of patients seen was 5,201, an increase of 193 over the previous year. In the neurology clinic there were 532 new patients seen, 3,731 revisits and 125 visits to the night clinic. In neurosurgery there were 194 new patients seen and 744 revisits. The clinics continue to play an important role in the medical, surgical, social care and follow up of our patients. It is unfortunate however that some way cannot be found to pay the full cost of these patients who so urgently need help.

Records

Under the direction of Dr. Graham and Mrs. Von Nida, the records continue to move on towards the record room in a never ending stream.

The hospital record is truly the heart of all clinical research and every effort has been made to maintain the highest possible standard. Special mention should be made of the excellent spirit of cooperation that exists in all the clerical staff.

Business Office

Since the last annual meeting the reorganization of the business office has been completed. Under the direction of Mr. Hogan and with the help of his loyal staff great progress has been made. Accounting for the clinical portion of the Institute was set up along the University budget system and has been instrumental in reducing our operation costs. Our major concern at present is to try and reduce the accounts receivable. The office staff are working hard on this and results are beginning to be apparent.

Employee benefits in the form of annuity, group life insurance and hospitalization have been extended to include the nursing staff. It becomes effective June 1st, 1958.

Maintenance and Repairs

As well as the usual painting and cleaning, several major projects have either been completed or are presently under way.

Showers have been installed in the continuous tub rooms on 2-South and 3-South. Rubber hose with spray attachments have been installed in all the continuous tub rooms. Extensive repairs and improvements are being made to the elevators. Insulating material has been applied to the walls of the Social Service department, with most excellent results. Sinks have been installed in the recovery rooms on all north wards. Work is about to begin on the pneumatic tube system which will connect with the Royal Victoria Hospital. A new and larger element was installed in one of our hot water storage tanks and the supply of hot water in the McConnell Wing is now satisfactory.

With construction work going on north of the stadium, parking continues to be a serious problem. With the help of Dr. Jasper, the ticker system has been improved, and with a new maintenance policy should continue to serve us well.

During the past year the improvement in maintenance and repairs has been most gratifying. Mr. Martin, the new Building Superintendent and his staff have been doing excellent work. Mr. Phillips has taken on new responsibilities and has done repairs quickly and economically. Mr. Defries, Mr. Cunningham and all the Members of the McGill Department of Buildings and Grounds have been most cooperative, and we are all extremely grateful for their help.

Finally a word about the cost of hospital care. This is a problem which causes us grave concern. The cost per patient per day has risen from \$26.51 to \$28.85. The increase is due partly to increasing costs and to the lower number of patient days. Still it is the patient who must pay.

Miss Flanagan handed me a gentle reminder, which I have kept on my desk, from an address by Dr. Austin Evans —

“Nothing must replace patient care as the primary goal of good patient care must precede every consideration of price, popularity, promotion and politics.”

Again, to all who have contributed to the smooth running and the wonderful “esprit de corps” of this Institute, I express deep appreciation on behalf of myself and the patients.

REPORT OF THE DIRECTOR OF NURSING

MISS EILEEN C. FLANAGAN

We have been fortunate the past year in having an excellent nursing staff and in addition two classes of graduate students in the post basic course, sixteen in each. Many of these students are sent here by their respective hospitals and return there, but the majority of the others remain with us and are a great asset in keeping the Institute supplied with specially trained staff. This is most in

portant firstly, because of the many specialized medical and nursing procedures carried out here, and also because of the amount of complicated and expensive equipment which they are required to use.

All the students of the Royal Victoria are now coming for a period of eight weeks each, and we find them also, a very interested and stimulating group.

The nursing load constantly increases due to the faster turnover of patients, resulting in increased numbers of procedures and a higher percentage of acutely ill patients.

It should be recorded that fewer and fewer patients are being bathed in bed. More and more we are using continuous baths, and the high shallow baths for bathing patients.

We have also installed shower baths in the continuous tub rooms on each floor. The new Hoyer Bed Lifts are used to move the patients from beds and wheel chairs to the baths.

These methods are used to keep the patients' skin in good condition, to prevent bed sores developing, and to prevent infection in tubs. In other words we are utilizing the hydro therapy methods in the daily ward routine. It is rather time consuming but the time saved in hospital days because bed sores are not allowed to develop, is well worth the time and effort.

There were 123,282 nursing periods during the year of which 1,929 or 1.3% were covered by 347 special nurses. In 1956 there were 603 special nurses covering 5,055 periods—a decrease of 256 nurses and 3,126 periods in 1957.

The National Film Board have made a picture depicting the life of foreign nurses in Canada, in which a considerable number of sequences were taken here at the Institute, using several members of our nursing staff, and in which Dr. Penfield and Dr. Cone also appear in the operating room scenes. The new "Auto Hypotherm" for hypothermia treatment is also shown in operation.

We are very grateful again to the Women's Auxiliary for a grant towards renovating the nursing residence and for providing part of the cost of a delegate to the International Council of Nurses' Meeting in Rome.

The Graduate Society was very active in holding meetings, both social and educational and in raising funds for sending our clinic children to camp, and other projects.

The medical staff assisted us in countless ways as always and have our grateful thanks.

I would like to emphasize again that another house is needed for our nursing staff and also say again that a moderate endowment fund is required for nursing education.

DEPARTMENT OF SOCIAL SERVICE

MISS JOYCE BEATTY

It is always a temptation to me, in presenting this annual report, to explain what social work is all about, and what social workers do in a hospital. Although

I realize it is hardly necessary to offer such explanations to this gathering, but I would like to give the following definition as a preface to my report. "Social casework is a process used by certain human welfare agencies to help individuals to cope more effectively with their problems". This, essentially, is our role in this hospital, where we find that so often, social and emotional problems interfere with the patient deriving the maximum benefit from medical treatment or where medical conditions create additional stress and strain within the family group.

During this past year, as in other years, we have been primarily concerned in giving casework service to patients and their families in relation to some problem of the illness situation. Referrals to our department have been for a number of reasons, ranging from discharge planning, to helping a patient face the future despite very serious disability.

In reference to discharge planning, the trend I noted in my last annual report, to planning for rehabilitation rather than for chronic care, has been even more apparent during the past year. Compared to several years ago, we have very few patients discharged to chronic-care institutions or nursing homes; we have many who are referred for treatment and follow-up in the rehabilitation centres. I wish it were possible for me to tell you of some of the amazing results of the rehabilitation of people who, in past years, would have remained helpless and chronic invalids. Of course, I realize that there is a small proportion of patients who, because of their medical condition, cannot benefit from these services. We, therefore, must continue to be greatly concerned about the lack of adequate chronic-care facilities in this community. This is a subject I bring up relentlessly, because I think it is of serious concern to hospitals, as well as to the community.

As I turn now to the work of the social service department in relation to the seizure clinic, I have some feelings of accomplishment but also a sense of being a little overwhelmed by the extent of the problems encountered here. The social problems among this group of patients are acute, so that the two social workers, Miss Folliott and Mrs. Puvrez, are carrying very heavy caseloads. In addition to this, they have undertaken two studies in the past year—one, a review of all new patients coming to clinic; and secondly, a 3-month employment study of men between the ages of 16 and 45 attending clinic. In cooperation with the consulting psychiatrist, Dr. Ferguson, discussion groups of parents of children with seizures, and of teenagers with seizures, have been organized. We have much to learn about organizing and leading such groups, but we are, I think, convinced of the value of this method in such a clinic.

Of increasing concern to us is the large group of patients suffering from multiple sclerosis. In this illness, which as you know attacks people during their most productive years, the social problems encountered are numerous and difficult. I feel that the time has certainly come when we must offer a co-ordinate service to this group, such as we have in the seizure clinic.

In each of my annual reports, I have referred to the importance of co-operating with other health and welfare organizations in the community, and I have expressed the conviction that the various groups who have given time and money in helping patients are indeed, part of our treatment team. The more experience I gain, the more convinced I become that the success of this hospital, and others like it, in treating patients, is due not only to the work that goes on within these walls, but also to the untiring effort of the people in the community who, in many ways, directly and indirectly, help our patients. To them all, I would say a sincere thank you.

One of the hardest jobs of the director of a department is to say goodbye to a valued staff member. I find myself in this position now, as I record the resignation of Mrs. Phills. Having observed her work over the past 5 years, I can say without any hesitation, that her leaving will be a great loss to our department and to the hospital.

To my own staff, to other hospital personnel, I say thank you for your help and cooperation.

DEPARTMENT OF ANAESTHESIA

DR. R. G. B. GILBERT

The Department continues in its endeavour to maintain the high standard of anaesthesia set in previous years. All anaesthetics have been given or supervised by a staff anaesthetist. The surgical staff cooperates in a manner which allows Dr. Millar to pursue solely research studies on Mondays and Tuesdays each week.

From July 1st Dr. G. F. Brindle was granted a leave of absence of one year to undertake further study in Medicine. This he is doing as Assistant Resident in Medicine at the Royal Victoria Hospital. Dr. Brindle's position has temporarily been filled by Dr. Roman Sluzar.

A number of elected cases have been performed under hypothermia. Our present method does not seem to involve too great a risk. The temperatures are not being allowed to fall as low as formerly, while at the lowered temperature a blocking agent is being used on occasion to reduce the blood pressure more. This should be a safer procedure than to lower the pressure in a patient with normal temperature.

Following investigations with a new inhalation agent—Fluothane—this drug has been incorporated with our armamentarium. It is found to be of special value during lengthy x-ray procedures while it is used during the terminal stages of a long general anaesthetic. By this method patients are usually awake, from an anaesthetic point of view, before they leave the operating room.

There was one death possibly associated with anaesthesia. No unusual cases of post anaesthetic complications were reported. Two patients with recently ruptured cerebral aneurysm died shortly after an angiogram procedure

under anaesthesia. Two other patients died in the operating room suite. One had an uncontrollable haemorrhage during a craniotomy and the other, as the result of a traffic accident, cardiac tamponade was suspected and proved in this instance.

Teaching

Dr. Gilbert has organized this as from the Department of McGill. He has personally participated in the lectures and film demonstrations.

Dr. Millar has given lectures and demonstrations concerning the Pharmacology of anaesthetic drugs, general and local.

Two residents have been appointed on a 6-month rotation from McGill Diploma Course, these residents receive clinical instruction at the Neurological Institute.

During the latter 6 months of the year each resident is also sent to the Royal Edward Hospital for instruction in anaesthesia for open chest surgery and tuition in bronchoscopy.

All residents have been given opportunity to study hypothermia.

Twice a year the Postgraduate nurses receive a series of 3 lectures from Dr. Gilbert.

New Equipment

A Cambridge cardioscope with remote recorder has been added to our equipment.

Research

Dr. R. A. Millar has continued his studies on the Plasma Catecholamine levels under a variety of conditions.

He has been able to study two cases of Pheochromocytoma in collaboration with other units.

The department has investigated the use of Fluothane and through the generosity of Ayerst, McKenna & Co. a temporary laboratory technician was financed to study liver function during its prolonged administration.

DEPARTMENT OF RADIOLOGY

DR. DONALD McRAE

During the year 1957, 8547 radiological examinations were carried out in the Department of Radiology. There were 716 lumbar encephalograms, 15 ventriculograms, 455 myelograms, and 167 cerebral arteriograms. This is 29% less than the previous year but still it was our second busiest year.

The chronic shortage of x-ray technicians continued and made it difficult to give complete service day and night on all occasions. An intensive campaign designed to attract Montreal secondary school students to this form of work is being organized by the local radiologists but will not make up for the overall shortage for two or more years.

Three residents from the Diploma Course in Radiology of McGill University, Drs. Douglas Sproule, Bruce Millar and Michael Bennett served as Residents in Radiology for four month periods during the year, as did Dr. Pierre Perras of the Diploma Course in Radiology of the University of Montreal. Visiting Fellows, spending two months or more in the department, were Dr. James Sienewicz of the Montreal General Hospital and Dr. Patrick Engels of the Brady Hospital, Atlanta, Georgia. Visitors spending shorter times in the department were Dr. James Irwin of San Diego, Dr. Terence Lalor of Sunnybrook Hospital, Toronto and Dr. Johannes Zimmer of the Ulleval Hospital, Oslo, Norway.

The Monday colloquium in Neuroradiology was continued as was the Neuroradiological Seminar given to the Fellows of the Neurological Institute in September, October, and November of each year.

It has been almost five years since we moved into the new Department of Radiology and now it is time to take stock. The space and arrangement for radiological diagnostic work is satisfactory as is space for film storage, record filing, and staff viewing. Office space for post-graduate students to use for studying, reading, and film reporting is inadequate while the isotope section has turned out to be more than adequate. We have been using the isotope counting room as overflow office space for post-graduate students.

The largest radiographic room fitted out for general radiography, myelography, as well as bed and stretcher radiography, has been eminently satisfactory. I would want no change in it except for a new 180° tilting fluoroscope table with either a direct image amplifier or a television amplifier in order to reduce the dose of radiation to patient and staff.

The second largest room planned for encephalography, ventriculography, and cerebral arteriography has been less successful, mostly because rapid, simultaneous, bi-plane arteriography has been disappointing. The technical quality of the films has been barely acceptable because of the fog produced by the tremendous amount of secondary radiation that is inevitable with this procedure. We have returned to single plane arteriograms in certain types of diseases because the film quality is much better. A synchronous motor driven fast film changer with an electronic program selector is needed to allow complete freedom in selecting the ideal number of films, time of exposure, rate of exposure and spacing of exposures.

The laminogram room was also fitted out for general radiography. However, it takes about ten minutes to set up the machine for laminography. As a result, we do not use it as much as we should, even though we have recently secured a multi-film cassette to make the procedure faster and easier and also reduce the radiation dose to the patient. A completely automatic laminograph that could be quickly switched to general radiography is needed to get the utmost value from this room and to get the utmost from laminography.

The fourth radiographic room has been, and always should be, a general purpose room. Although the equipment is rather old it still is in reasonable working condition and needs no change.

In our work we need the close cooperation of the medical and nursing staff and, as always, we have received it in full measure. It is a pleasure to be able to formally thank the medical and nursing staff for their understanding and assistance during the year just passed.

DEPARTMENT OF NEUROCHEMISTRY

Dr. K. A. C. ELLIOTT

Clinical Neurochemistry and Ward Laboratories

The volume of work in this department representing the 7th floor clinic neurochemistry laboratory and the 3rd floor ward laboratory has tended to plateau this year, after reaching a record level in 1956. The total number of procedures done in both laboratories was 25,280 as compared to 24,065 in 1956. Of these procedures 10,014 were performed in the neurochemistry laboratory while 15,806 were done by the ward technicians—both representing only slight increases over last year. In addition, 4,708 blood samples were obtained for analyses here and in other departments of the hospital, a figure comparable to last year's. Similarly 5,040 litres of irrigation solution were prepared for the operating rooms, no change from last year.

Following a special request from the clinical services we now prepare solutions of Nupercaine in "Elliott A" solution for use throughout the Institute in place of the solutions previously obtained from the Royal Victoria Hospital.

Dr. H. Pappius and Dr. I. Heller continue to supervise technical and administrative details of both laboratories.

DONNER LABORATORY OF EXPERIMENTAL NEUROCHEMISTRY

Dr. K. A. C. ELLIOTT

Since the identification of Gamma-aminobutyric acid as probably the main substance responsible for the Factor I activity of brain extracts, the field has become explosively active with studies on "GABA" going on in many laboratories as well as our own.

We were happy to have Dr. Franz Hobbiger, of the Middlesex Hospital, London, with us for nearly 7 months. With the assistance of Mrs. Hobbiger he conducted much needed pharmacological studies on GABA. In work with isolated intestines of various animals he demonstrated interesting, but puzzling direct effects and anti-acetylcholine, anti-nicotine and anti-histamine effects on GABA. He also made well-recorded studies on effects of GABA, injected intravenously and intrathecally, on the heart, respiration and circulation of anaesthetized animals. The analyses of these effects should help in understanding the curious effects of GABA on human subjects and animals.

Nico van Gelder completed his study with brain slices by showing that there is an interesting type of equilibrium between glutamic acid and GABA in brain slices and that the retention of GABA and the strong absorption of it

substance from the surrounding fluid are active processes dependent on energy metabolism. This latter result was nicely confirmed by finding the expected changes in amount and condition of the GABA in the brains of animals in insulin hypoglycemic coma. Mr. van Gelder has also shown that Factor I assays with the chemical determinations of others in showing a decrease in the GABA content of the brains of animals treated with convulsant hydrazides. He has also studied the fate of GABA administered to animals. When large doses are given the substance quickly becomes distributed in the blood and organs, but quickly leaves them again as it is very rapidly concentrated and excreted in the urine. No sign of an increase in brain GABA could be achieved though traces entered the cerebro-spinal fluid of anaesthetized cats.

Dr. Jasper and Dr. Salvador Gonzales have carried on the work, started with Dr. Iwama, on the effects of topically applied GABA on the evoked electrical activity of the cerebral cortex. The main emphasis has been on laminar studies, unit potentials and the interrelation of the effects of GABA and those of strychnine and picrotoxin.

Michael Rosenfeld returned to the laboratory for the summer and completed an investigation of the effects of deprivation of oxygen and glucose on the subsequent glycolysis by brain. Contrary to previous belief it appeared that the rapid inactivation which is caused by deprivation is reversible under "physiological" conditions. It was concluded that the rapid permanent derangement of function caused by brief cerebral anemia is not due to irreversible damage to the systems responsible for producing energy.

Dr. Hanna Pappius completed her study on the energy metabolism, electrolyte and water metabolism of brain in various sodium-free media. Clear evidence was obtained for a mechanism in brain which, by specifically extruding sodium, helps potassium to accumulate and it was shown that every monovalent anion has its own specific effects. She also completed re-examination of earlier work on acetylcholine metabolism in brain tissue from epileptic patients and drug-treated animals. Unfortunately, apparently very interesting results obtained previously in this laboratory could not be repeated. She has now returned to work on the nature of the "extracellular space" in brain and the nature of, and factors involved in, brain swelling.

Dr. Dorothy Johnson and Dr. Pappius have studied the relation of the high energy phosphate content of brain tissue to its capacity to glycolyze and to concentrate potassium. Their results explain rather well the results of Mr. Rosenfeld (above) on factors which inhibit and restore glycolysis.

Dr. Irving Heller has managed to keep active work going on the metabolism of normal and degenerating peripheral nerve and is now studying the metabolism of nerve from chickens poisoned with an agent, triorthocresyl phosphate, which causes a peripheral neuropathy in these animals.

DEPARTMENT OF ELECTROENCEPHALOGRAPHY

DR. HERBERT H. JASPER

DR. PIERRE GLOOR

The work of this laboratory seems to have reached a fairly stable plateau with a slight drop in the number of examinations carried out (2727) as compared to the previous year (2766). There were 1657 examinations carried out on patients admitted to the Neurological Institute, the remainder, that is 107 being done on patients referred from the Outpatient Clinic, private offices and clinics outside the Royal Victoria. There were 134 electromyograms done on patients with various neuromuscular diseases.

There were only 50 electrocorticograms carried out on patients during surgical exploration for the treatment of focal epilepsy. This reflects a decrease in the number of operations being carried out by the neurosurgical staff for the treatment of focal epilepsy. Out of the total of 908 epileptic patients examined only 50 or 5½% came to operation, the remainder being given only medical treatment.

Fellows in training during 1957-58 were Dr. Mary Morrow, Dr. S. L. Ray, Dr. A. Fortin, Dr. D. Bloom, Dr. E. Keener and Dr. A. Tarazi.

Dr. Bloom completed an interesting study of the results of unilateral temporal lobectomy upon epileptic patients with bilateral localization in the EEG. Lilli Prisko has been admitted to the Graduate School of McGill. She is working toward her Ph.D. degree under the direction of Dr. Gloor.

The department was host to the Eastern EEG Association for their six week-end at St. Adele in February. The Symposium on endocrine factors affecting the electrical activity of the brain organized by Dr. Gilbert Glaser was received with much interest. The down hill ski race was won again (the 4 time!) by Dr. Cosimo Ajmone-Marsan.

DEPARTMENT OF NEUROPHYSIOLOGY

DR. HERBERT JASPER

The departure of Dr. Robert Martin, together with several good research fellows, has made necessary considerable re-organization of work in this department during the past year. New fellows have been able to carry on with some of the work already in progress and to begin some new projects.

Dr. Gloor, with the assistance of Dr. Ray, has been making important observations upon how excitation is built up in dendritic and cellular layers of the hippocampus leading to sustained epileptic discharge. Continued studies of the action of Gamma Amino-butyric acid upon the electrical activity of cells and dendrites of the cerebral cortex have been carried out by Dr. Gonzales (with Drs. Jasper and Elliott). These studies, together with the microelectrode studies of mechanisms of epileptic discharge in the cerebral cortex, which have

formed the basis for the Ph.D. thesis of Dr. Rayport, have contributed much, not only to our understanding of mechanisms of epilepsy but also to our knowledge of normal mechanisms of interaction of nerve cells and dendrites in the integrative organization of the brain.

Microelectrode studies of neurophysiological mechanisms of conditioning, learning and attention, being carried out with Drs. Ricci and Doane, are continuing with Drs. Horn and Gybels, with renewal of the grant from the National Science Foundation of the United States.

Dr. Branch has completed his Master's thesis on the microelectrode analysis of excitation and inhibition of pyramidal cells of the motor cortex, research carried out in collaboration with Dr. Robert Martin.

Dr. Yamamoto has been making good progress with his studies of the effect of amygdaloid and hippocampal seizure discharge upon the unitary function of the cells of the temporal neocortex, which should give some insight into mechanisms of temporal lobe seizures.

Drs. Blundell and Gybels have begun a programme of research on the basal ganglia in relation to dyskinesias in collaboration with Dr. Bertrand under a grant from the Kenny Foundation. They will soon be ready for the application of stereotaxic techniques to the surgical treatment of Parkinsonism and other dyskinesias in man. In connection with this programme, Dr. Fortin is perfecting methods for the objective measurement of tremor and spasticity in man.

Dr. Rasmussen's programme of study of the effects of hypothermia upon cerebral infarcts produced by arterial occlusion in monkeys is being continued with Dr. Samson. Drs. Keener and Perot have been studying the effects of various new antibiotic agents upon the electrical activity of the cerebral cortex in cats.

The work of this department has been aided greatly by the skilful assistance of Mr. Robert Nagler, head of our department of electronics, and by the expert and ever willing assistance and management of Miss Mary Roach.

DEPARTMENT OF NEUROSURGICAL PATHOLOGY

WILLIAM V. CONE, M.D.

GILLES BERTRAND, M.D.

The volume of work of the Department of Neurosurgical Pathology changes little from year to year. Five hundred and forty-five specimens were studied. Seventy-four post mortem examinations were carried out. Twenty reports on specimens sent in for opinions were made.

Dr. Gordon Thompson was Senior Fellow from July 1, 1957, to July 1, 1958. Dr. John Kennedy, Dr. Phanor Perot, Dr. Christian Vera, Dr. Hugh Samson and Dr. Katusutoshi Kitamura, each spending at least six months in the laboratory, helped with the routine work. Dr. Thompson and those assisting him are commended for the quality of the reports and the speed with which they were completed.

DEPARTMENT OF NEUROANATOMY

DR. FRANCIS McNAUGHTON

A major activity during the Fall term was the combined course in Neuroanatomy and Neurophysiology for the undergraduate second year. This course is given by members of the Institute Staff, in close collaboration with Professor Burns and the Dept. of Physiology at McGill. It is designed as the student introduction to the study of neurology. In addition to lectures and laboratory work, patients are shown to illustrate the application of basic anatomy and physiology to clinical problems. This course has proved stimulating for both students and staff, and provides teaching experience for the Fellows who assist in the course.

We were fortunate in having with us from September 1957 to May 1958 as Visiting Professor of Neuroanatomy, Dr. Joseph Klingler of the Anatomic Institute, University of Basel. Dr. Klingler has perfected a method of fine dissection of the brain which is of great value in the graduate teaching of Neuroanatomy. (The method has been published in the "Atlas Cerebri Humani" by E. Ludwig and J. Klingler; Karger, 1956). Dr. Klingler conducted a very successful dissection course during the fall and winter months, to a group of some 50 graduate students from the Institute and other University Departments. He also prepared a number of brain dissections for the permanent teaching collection.

Dr. E. Ramon-Moliner is continuing his research on the microscopic structure and connections of the post central cortex (cat), supported by a graduate Medical Research Fellowship from the National Research Council Canada.

Mr. John Reford continues his work in plastic embedding of anatomic and pathological material.

DEPARTMENT OF NEUROLOGICAL PATHOLOGY

DR. GORDON MATHIESON

During the academic year presently nearing its end, the members of the department have been engaged in a variety of pathological problems, almost purely morphological in character. Dr. Mary Jane Aguilar has made a survey of the material obtained in the course of the surgical treatment of epileptic patients during the period 1950-58, with special reference to those cases presenting a rather distinctive, progressive course. Dr. Allan Morton has embarked on a detailed quantitative study of the changes in the human hypothalamus following hypophysectomy. Dr. William Bryans, in the course of an energetic 6 months, completed a study of the effect of colchicine on the mitotic activity of the mantle layer in the rat, in addition to assisting with the routine autopsy investigations and undergraduate Neuroanatomy teaching. Dr. Gulati is mea

time assisting part time with the work up of autopsy material. The atlas of the cat brain stem upon which Dr. Mathieson is collaborating with Dr. Olzewski of Saskatoon is making slow progress but should be accelerated during the summer months.

The close relationship with the Pathological Institute established during the past years has been maintained. The brains obtained from some 440 autopsies carried out there during the period January to December 1957 have been examined and a brief record together with the histological slides and blocks filed in this department. In addition to much interesting and often unexpected neuropathological material, this arrangement provides a valuable reminder of the variations of the brain in non-neurological diseases. Detailed autopsy studies have also been carried out on 27 patients dying in the Neurological Institute; in every case this has involved examination of the brain, while in a few the spinal cord, peripheral nerves and musculature have also been examined. During the year 7 specimens were referred in for opinion.

Alterations are in progress in the Sixth Floor Museum; the large viewer has been raised to a more convenient viewing angle and, in collaboration with Mr. Hodge, a considerable expansion of the present exhibits is planned; material for this is already in hand. A second double binocular Zeiss microscope has been obtained and will be available for use in the museum.

A close relation has also been maintained with clinical neurology more especially in the form of clinico-pathological conferences on Thursday afternoons. At these, emphasis is laid on a full discussion of the clinical aspects of the case, the clinicians taking part being untrammelled by knowledge of the pathological findings. Material referred from outside hospitals has helped greatly in arranging these conferences: we are especially indebted to Dr. David Howell and to Dr. Herbert Martin of Burlington, Vermont, for help in this regard.

During the year a succession of minor rearrangements have been made in the laboratory in order to streamline the processing of routine material and to make way for future developments. We look forward to an expanding programme of work in the ensuing years.

TUMOUR REGISTRY

DR. ARTHUR R. ELVIDGE

An important aspect of tumour research is that concerned with the accurate classification and follow up of patients who have undergone various types of treatment for tumour.

The routine recording and the ensurance and supervision of follow up through the neurology and neurosurgery clinics, through the cooperation of private offices, and by correspondence through devious channels in out of town patients, is the principal function of the registry. This renders a great service to the patient. If he is negligent to return for the treatment advised by his

doctor, he is reminded. If the patient needs help or rehabilitation he is referred to the Social Service Department. This is carried out in cooperation with the attending physician or surgeon, and with the valuable assistance of the Social Service Department.

The Registry file has been under the direct supervision of Mrs. E. Goodchild of India, who previously worked in the Royal Victoria Hospital tumour Registry. She took over from Mrs. M. Smith, who has transferred to the records department of the Women's Pavilion.

The routine medical follow up in clinics has been assumed by Doctor E. Berger, who is also carrying on a special research follow up study of the medulloblastomas. Doctor Roth has completed a statistical study of glioblastoma multiforme which will be published later. Other problems have concerned acoustic neuromas, and a list of pituitary tumours has been prepared for Dr. Beck and Dr. Rasmussen.

The tumour follow up is complete from 1950, and is complete in certain areas as far back as 1928, as the result of special research projects carried out by fellows.

Each year many new cases are added and pass through the channels of the registry. This year the total number of patients whose records were processed was 241. Of these 133 were verified cases of tumour, 120 new, and 13 recurring problems. Altogether 123 operations were performed on these patients, and 4 received x-ray therapy. There were 229 clinic visits.

REPORT ON NEUROPHOTOGRAPHY

DR. GILLES BERTRAND

MR. CHARLES HODGE

The Department maintained the continued growth again this past year serving all departments and laboratories in the Institute.

There has been a great increase in the number of 35 mm. black and white and colour slides made by the Department. With new colour developing equipment we have been able to speed up on the delivery of colour slides, in many cases giving 6 hours service so that the slides taken in the morning could be used later in the afternoon. There has been a great increase in the use of colour photography in the Institute.

The Department is pleased to say that there is a renewed interest in the 6th Floor Photographic Museum. At present the museum is being raised so that the colour transparencies will be at a better height and there are now interesting cases to go into this museum.

During the year the assistant photographer, Mr. John Gunn, left us to take over the department of photography of the Montreal Children's Hospital. We are happy that after 2 years he is able to take charge of a department by himself. Mr. Gunn has been replaced by Mr. Vincent Taylor who is learning medical photography very rapidly.

During the past year the Department was approached as to the possibility of training medical photographers under the Colombo Plan, and at present we are training Mr. Rassiah Surendranathan from Ceylon, who is spending a year in this department.

THE FELLOWS' LIBRARY

DR. DONALD LLOYD-SMITH

In the past year a landmark was reached with the addition to the Fellows' Library of a unique and outstanding collection of 125 volumes. Dr. Wilder Penfield generously donated his collection of papers and monographs, including contributions by most of the prominent neurologists and neurosurgeons of the last half century. There are few libraries so richly endowed with such a collection, important both from the historical and scientific viewpoints. Many of these volumes are unique and irreplaceable. A special section of the library has been set apart for this collection.

During the year arrangements were made for the binding of reprints from the Montreal Neurological Institute and their exchange with outstanding neurological institutes and centres throughout the world. A better international exchange of ideas and wider survey of work in the field will thus be obtained.

This year an additional 32 new volumes have been purchased for the library, and gifts of 17 other volumes have been made by Doctors Wilder Penfield, Herbert Jasper and Francis McNaughton. We are again deeply grateful to Doctor Jasper for the donation of subscriptions to 31 journals through exchange arrangements with the Journal of Electroencephalography and Clinical Neurophysiology, constituting a most important supplement to the library's regular subscriptions of 57 journals.

The demand for new additions to the library again greatly exceeds the library budget, and a further increase in the financial support is urgently needed.

THE MONTREAL NEUROLOGICAL SOCIETY

<i>President</i>	DR. A. R. ELVIDGE
<i>Vice President</i>	DR. G. COURTOIS
<i>Secretary-Treasurer</i>	DR. J. B. R. COSGROVE

Thirty-two meetings of the Section of Neurology of the Montreal Medico-Chirurgical Society were held weekly from October 2nd., 1957 to May 14th., 1958.

Of special interest during the season was the Annual Neuroanatomical Lecture, which was given this year by Dr. Stanley Cobb of Harvard Medical School, and who spoke on "Some Problems of Avian Neurology".

In addition to clinical meetings held at Notre Dame Hospital, the Hôpital du Dieu, the Montreal General Hospital, the Montreal Children's Hospital and the Montreal Neurological Institute, stimulating clinical meetings were held at Queen Mary's Veterans Hospital and Ste. Justine Hospital. Of particular interest was the special clinical meeting held to mark the opening of the new Ste. Justine Hospital.

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

- DR. H. EDGAR ROSVOLD, National Institute of Mental Health, Bethesda, Md.: "Studies on Brain-Behaviour Relationships".
- DR. SANFORD PALEY, National Institutes of Health, Bethesda, Md.: "The Fine Structures of Cellular Units in the Central Nervous System".
- DR. GILBERT H. GLASER, Yale University, New Haven, Conn.: "Spasticity and Spasms".
- DR. J. H. QUASTEL, Research Institute, The Montreal General Hospital: "Recent Investigations into the Biochemistry of Cancer".
- PROFESSOR PAUL CASTAIGNE, Médecin de la Salpêtrière, Paris: "L'Epilepsie Tardive".
- DR. K. A. C. ELLIOTT, the Montreal Neurological Institute: "Gamma Aminobutyric Acid".
- DR. D. LLOYD SMITH, the Montreal Neurological Institute: "Cervical Spondylosis".
- DR. R. RABINOVITCH, the Montreal Neurological Institute: "Temporal Lobe Epilepsy in Identical Twins".
- DR. J. Z. YOUNG, Department of Anatomy, University College, London, England: "Memory Systems in Octopi".
- DR. STANLEY COBB, Harvard University Medical School: (Annual Neuroanatomical Lecture) "Some Problems in Avian Neurology".
- DR. CLAUDE BERTRAND, DR. LOUIS POIRIER, DR. MARTINEZ, The University of Montreal: "Further Studies in Extra-Pyramidal Surgery".
- DR. F. HOBIGER, the Montreal Neurological Institute: "Studies on a New Antidote for Acetylcholine Poisoning Produced by Insecticides and Related Organophosphates".
- DR. V. PAVILANIS, Department of Micro-Biology, University of Montreal: "Relations Between Anteroviruses and the Central Nervous System".
- DR. ANNIE COURTOIS, DR. PIETRO CORTI, DR. GUY COURTOIS, Ste. Justine Hospital: "Acute Localized Encephalopathy of Undetermined Cause in Childhood".

- DR. C. MILLER BALLEM, Royal Victoria Hospital, and DR. LIONEL LEMIEUX, Roy Rousseau Clinic, Quebec. "Liver Diseases and the Central Nervous System".
- DR. J. PURDON MARTIN, The National Hospital, Queen Square, London, England: "The Function of the Basal Ganglia".
- DR. D. O. HEBB, Department of Psychology, McGill University: (Twenty-third Annual Hughlings Jackson Lecture) "Intelligence, Brain Function and Theory".

THE FELLOWS' SOCIETY

DR. ELLIS B. KEENER, *President*

DR. GORDON B. THOMPSON, *Vice-President*

DR. PHANOR L. PEROT, *Secretary*

There are 35 Fellows from 10 countries. The Society has had an active social and scientific year.

The scientific program consisted of several informal meetings with the following distinguished speakers: Dr. L. Ectors, Dr. J. G. Greenfield, Sir Geoffrey Jefferson, Mr. Terence Cawthorne, Dr. Sanford Paley and Dr. J. Purdon Martin.

The Annual Lecture had to be cancelled due to unforeseen circumstances. An alternative program of a Fellows' Scientific Session, dinner at the Queen Elizabeth Hotel, and a Symposium: A Prediction of Significant Areas of Neurological Research During the Next Twenty Years; Drs. Wilder Penfield, Theodore Rasmussen, Herbert Jasper, Francis McNaughton and K. A. C. Elliott, is scheduled for June 4, 1958.

CLINICAL APPOINTMENTS AND FELLOWSHIPS*

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

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

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

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

Appointments for periods of research and training in one of the laboratories are made by Professor Rasmussen and the Chief of the laboratory in question. Research stipends are available for the following Fellowships.

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

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

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

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

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

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

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

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

COURSES OF INSTRUCTION

UNDERGRADUATE

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

GRADUATE

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

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

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

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

Professor McNaughton

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

Professor McNaughton

B. SEMINAR IN NEUROPHYSIOLOGY.

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

Professor Jasper

C. COLLOQUIUM IN CLINICAL NEUROLOGY.

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

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

D. SEIZURE MECHANISMS AND CEREBRAL LOCALISATION: Clinical 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.

Professor Elliott

F. CONFERENCE IN NEUROSURGICAL PATHOLOGY.

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

Professor Cone

G. DEMONSTRATIONS IN MEDICAL NEUROPATHOLOGY.

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

Professor Mathieson

Graduate credit is given for either:

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

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

(c) Passing written and practical examination in neuropathology.

H. CLINICAL NEUROPATHOLOGICAL CONFERENCE.

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

Professor Mathieson

I. SEMINAR IN NEUROLOGICAL RADIOLOGY.

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

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

Professor McRae

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RESEARCH FUNDS

1934 — Rockefeller Foundation Endowment
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Elizabeth Kenny Foundation — Dr. Rasmussen

U.S. National Science Foundation — Dr. Jasper

U.S. Public Health Neurological Training Grant — Dr. McNaughton

CLASSIFICATION OF DISEASES

Nervous System Generally:

Neurosyphilis	
Multiple Sclerosis	
Motor Neurone Disease	

Meninges:

Meningocele and Myelomeningocele	
Acute Purulent Meningitis	
Tuberculous Meningitis	
Headache	
Subdural Haematoma	
Subdural Hygroma	
Epidural Haematoma	
Subarachnoid Haemorrhage	
CSF Rhinorrhea	
Miscellaneous	

Brain:

Congenital Anomalies	
Hydrocephalus	
Brain Abscess	
Cerebral Concussion	
Cerebral Contusion, Laceration, Traumatic Encephalopathy	
Epilepsy	4
Migraine	
Parkinsonism	
Cerebral Thrombosis, Encephalopathy due to Arteriosclerosis	1
Cerebral Haemorrhage	
Cerebral Embolism	
Intracranial Aneurysm	
Encephalitis	
Miscellaneous	

Tumors:

Gliomas	
Perineurial Fibroblastoma	
Meningeal Fibroblastoma	
Pituitary Adenoma	
Craniopharyngioma	
Angioma	
Glioblastoma Multiforme	
Metastatic Carcinoma — general body	

Meningioma	1
Astrocytoma	25
Ewing's Tumour	1
Meduloblastoma	5
Tumour Brain	20
Secondary Tumours, Brain, Spinal Cord	19
Chordoma Pituitary	1
Hygroma	1
Sarcoma	7
Neurofibroma	3
Dermoid Cyst	1
Oligodendroblastoma	2
Oligodendroglioma	1
Haemangioblastoma	4
Spongioglastoma Polare	3
Cyst Brain	1
Chromophobe Adenoma Pituitary	3
Tumour Cord	1
Recklinghausen's Disease	1
Neuroepithelioma	1
Osteoma	2
Granuloma, eosinophilic	1
Hypophyseal Duct Tumour	1
Miscellaneous CNS and Skull	26
Miscellaneous Tumours, Body Generally	5

Spinal Cord:

Compression of the Spinal Cord	9
Acute Myelitis	6
Guillain Barre Syndrome	8
Myelopathy, Cause Unknown	18
Syringomyelia	4
Miscellaneous	2

Cranial and Peripheral Nerves:

Optic Neuritis	10
Trigeminal Neuralgia	69
Bell's Palsy	6
Meniere's Syndrome	20
Traumatic Peripheral Nerve Lesions	32
Other Neuralgias	16
Peripheral Neuropathy	19
Miscellaneous	15

Muscles:

Myasthenia Gravis	7
Miscellaneous	49

Mental Diseases:

Mental Deficiency	7
Schizophrenia	1
Depression	41
Drug Addiction	12
Psychoneurosis	15
Organic Psychosis	12
Miscellaneous	4

Other Systems:

Occipitalization Atlas	
Congenital Anomalies — Spine	
Congenital Anomalies — Skull	
Protrusion Disc — Lumbar	
Cervical	
Fracture and/or Dislocation of Vertebral Column	
Fracture Skull	
Back Pain	
Intractable Pain	
Facial Pain	
Traumatic Lesions and Infections, Miscellaneous	
Arthritis Spine	
Miscellaneous, Undiagnosed	

CLASSIFICATION OF OPERATIONS

Craniotomy (Ostoplastic, miscellaneous, etc.)

Hemispherectomy
 Pedunculotomy
 and Biopsy
 and Decompression
 and Drainage of Abscess
 and Drainage of Subdural Haematoma
 and Drainage of Intracerebral Haematoma
 and Drainage of Extradural Haematoma
 and Excision of Epileptogenic Tissue of Brain
 and Excision of Aneurysm
 and Exploration
 and Hypophysectomy
 and Obliteration of Aneurysm
 and Obliteration of Cyst
 and Plastic Repair of Dura
 and Removal of Adhesions
 and Removal of Tumour
 and Rhizotomy
 and Sinusectomy
 and Lobectomy
 and Biopsy
 and Drainage of Subdural Space
 and Placement of Electrodes
 and Drainage of Abscess
 and Ventriculography
 and Exploration
 Elevation of Depressed Skull Fracture
 Plastic Repair of Skull Defect, Tantalum
 Plastic Repair of Skull Defect, Bone
 Suture of Lacerated Wound of Scalp
 Ventriculocisternostomy (Torkildsen's)
 Morcellation of Skull
 Artificial Cranial Suture

Laminectomy or Hemilaminectomy

and Anterolateral Cordotomy
and Decompression of Spinal Cord
and Exploration

and Incision and Drainage Intramedullar Cyst	2
and Incision and Drainage of Abscess	1
and Removal of Tumour	13
and Rhizotomy	5
and Spinal Fusion, Hibbs'	3
and Spinal Fusion with Bone Graft	16
and Spinal Fusion with No. 18 Wire	3
and Discoideotomy	185
and Cervical Discoideotomy	12
and Cervical Occipital Fusion	1
Cutting Dentate Ligament	1
Plastic Repair of Cranium Bifida	2
Plastic Repair of Spina Bifida	4
Nerve Avulsion	4
Ligation of Artery	1
Exploration of Nerve	9
Ligation of Artery with Silverstone Clamp	11
Neurectomy	6
Removal of Neuroma	1
Re-opening of Wound with Evacuation	6
Re-opening of Wound with Exploration	4
Re-opening of Wound with Removal of Bone Flap	1
Re-opening of Tantalum Plate	2
Re-opening of Wound and Repacking	6
Re-opening of Wound with Drainage of Infection	2
Re-suturing of Wound	2
Miscellaneous	42
Plaster Cast	48
Ventriculo-Peritoneal Shunt	8
Cerebral Arteriography — Percutaneous	118
Tic Injection	20
Nerve Blocks	12
Tracheotomy	4
TOTAL	865

CAUSES OF DEATH

Head Injuries	21
Tumours	23
Hydrocephalus	2
Aneurysms	10
Cerebral Haemorrhages	6
Meningitis	5
Subdural Haematomas	6
Oedema of Brain	6
Thrombosis	5
Carcinoma — General	4
Other Systems	17
TOTAL	105

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