

Twenty-Seventh Annual Report

of the

**MONTREAL NEUROLOGICAL  
INSTITUTE**

and the

**DEPARTMENT OF NEUROLOGY  
AND NEUROSURGERY**

McGILL UNIVERSITY

1961-62



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## REPORT OF THE DIRECTOR

DR. THEODORE RASMUSSEN

This is our 27th annual report to the Principal and the Board of Governors of McGill University. It also serves a broader purpose in reporting to the community, to the various levels of government, to our benefactors who continue to support the clinical and scientific work of the Institute, to our former Fellows, to our co-workers, and to our friends around this rapidly shrinking world of ours.

We welcome back Dr. and Mrs. Penfield from literary labors on the shores of Italy's Lake Como and look forward to the Jaspers' return this summer from their sabbatical year in Paris, dodging plastic bombs in the streets, and coping with the verbal bombs reverberating around the Headquarters of Unesco.

The year brought scientific recognition and honors in various forms to many of our staff, but time permits mention here of only a few. The Swiss Academy of Medical Sciences awarded the Robert Bing Prize to Dr. Pierre Gloor, the presentation being made in Basle, Switzerland, in March. We also report with pride the award of a Medical Research Council Associateship to Dr. Leonhard Wolfe of the Donner Laboratory of Experimental Neurochemistry. Dr. Arthur Elvidge paused in his travels long enough to be Honorary Guest at the 70th Anniversary of the Foundation of the Hospital Vargas of Caracas, Venezuela, at the invitation of Dr. Martinez-Coll, one of our former fellows, and also to serve as Visiting Professor of Neurological Surgery at the National Institute of Neurological Diseases and Blindness in Bethesda, at the invitation of Dr. Maitland Baldwin, another of our distinguished former fellows. Dr. Donald McRae, who is beginning to rival Dr. Elvidge as world traveller, served as Visiting Professor of Radiology at the University of Oregon. The award of a Markle Scholarship to Dr. Allan Sherwin is particularly gratifying since he is completely a product of Montreal and McGill.

The year also brought its ration of staff changes. Dr. Ronald Millar left us last autumn to take charge of anaesthesia in the new Neurosurgical Unit in Cambridge, England, taking with him our best wishes for a happy and productive career over there and our appreciation of his contributions to both the clinical and research aspects of our anaesthesia department over the past 5 years. Dr. Richard Gilbert is currently the President of the Canadian Anaesthetists' Society, and has been elected an honorary member of the Association of University Anaesthesiologists. We welcome Dr. J.J. McGrath, Newfoundlander and McGill graduate, to our anaesthesia staff, and we are also enjoying the help of Dr. William McCleery of Belfast, Ireland, in this department.

Dr. P.K. Thomas, recently of the National Hospital at Queen Square, London, England, joined the Division of Neurology at the Montreal General Hospital with a McGill appointment as Assistant Professor in the Department of Neurology and Neurosurgery. He has been particularly interested in electromyography, and we are most pleased that he has agreed to take over supervision of our Electromyography Laboratory on a part-time basis.

We welcome as our new business manager, Mr. Charles Noel, Montrealer and McGill graduate, who has worked with Mr. Hogan during these past few months, ironing out the details of our final 1961 hospitalization financial statement and the 1962 hospital budget.

The Institute consists of three separate yet closely related organizations — hospital, research institution, and university teaching department. The reports of the previous speakers have covered in brief summary the principal aspects of all three, but the complex inter-relationship of these three functions cannot be categorized in a brief series of reports like this. The financial aspects of the hospital division, however, have always been separate and distinct from the research and teaching budget. The first year of the Provincial Hospital Insurance Plan with all its uncertainties is now behind us, and Dr. Robb's report is encouraging in suggesting that its growing pains are beginning to subside. The lack of an adequate approved budget has made the past year a most difficult one. We hope current negotiations as provided for under Regulation 17 of the Hospital Insurance Act will bring us a supplementary grant to cover the \$57,000 balance by which our 1961 expenditures exceeded our Hospitalization Plan payments. We also urgently need a satisfactory adjustment of our 1962 budget which, as presently approved, completely inadequate and unrealistic.

The cost of first-class, up-to-date hospital care is high, but this must be weighed against the real cost of less than the best which would be measured not only in dollars and cents but in increased morbidity, disability, discomfort and even in avoidable loss of life. Hospitalization costs have risen steadily and will continue to rise as more effective methods, drugs, equipment and expanding medical knowledge increase the curability of more of mankind's ailments. The cost of the Saskatchewan Hospital Services Plan, for example, has risen five-fold since it was launched in 1947.

The cost of running the hospital side of the Institute has risen in almost linear fashion, from \$829,000 for 1953-54, the first year after opening of the McConnell wing, to \$1,748,000 for the calendar year 1961 with the cost per patient day rising, in round figures, from \$23 to \$37 over the same period. The high proportion of seriously ill patients in our specialty and the complexity of diagnostic procedures and therapeutic techniques have kept our costs per patient day significantly above those of the Province's major general teaching hospitals, and for the foreseeable future this is likely to continue to be the case. It must be emphasized that we are a *special* hospital and our problems are of an entirely different order from those of a *general* hospital of a similar size. Adequate financial recognition of this difference is essential if our standards of patient care are to be maintained.

The special role of the teaching general hospital, and of special hospitals like this Institute, in developing new and improved methods of patient care and in training medical and paramedical personnel, must be constantly borne in mind by the holders of the Provincial purse strings, if the citizens of Quebec are to reap maximum benefit from today's rapidly expanding medical knowledge. In this connection, I should like to quote the final paragraph of the brief presented on April 17, 1962, to the Royal Commission on Health Services by the Quebec Division of the Canadian Medical Association.

"Finally, we submit that the future of Canadian health care is in the hands, not of those who by their present stake in it stand to gain or lose by any plan which may be introduced, but of those uncommitted Canadian students who in coming years will exercise their free choice of a career. If the government and the people do not achieve a plan which will draw them into the health professions, then an immeasurable tragedy will have been added to the history of the free and democratic world."

This paragraph was written, of course, primarily with the supply of physicians for the future in mind, but it is equally applicable to nurses, dietitians, x-ray technicians, laboratory technicians and all the other special personnel who turn bricks and mortar into a hospital. The most modern and elaborately equipped hospitals in the world are useless unless properly trained and highly motivated people are available to staff them. The government and the community must be constantly on guard against short-sighted financial policies that would tend to turn able young people away from careers in the many ramifications of the health field.

Our indebtedness from the accumulated deficits of past years continues to concern us and McGill. We, like many other hospitals in the Province, await word from the Provincial Government as to how hospitals are to be assisted in handling this debt, which in our case is approximately half a million dollars.

From the long-range standpoint, the most important single aspect of the whole health field in improving the health of the citizen of the future is research. The dramatic advances in medicine made possible by the basic and clinical research workers over the past 40 years will probably seem insignificant alongside those that lie ahead in the next 40 years if medicine and biology continue to attract their share of top-notch students. Prospects are particularly bright in the neurological disciplines, where rapidly expanding frontiers demand exploration with evermore complicated techniques and specially trained teams. These teams cannot be satisfactorily provided for with short-term financial support. Strong teams can only be formed on a solid and broad base of permanent endowment to which short-term, 1, 3 or 5-year grants can be added. The larger the proportion of permanent endowment the greater the likelihood of continued output of significant research.

Support for medical research from Canadian governmental sources is gradually increasing, but at much too slow a rate in comparison to the need and the opportunities. Most of this support is in the form of 1 to 3-year project or term grants. If a larger proportion of these funds, by some formula

acceptable to the government, could be channeled into endowments for selected research-oriented university departments across the country, the productivity of the research dollar would be increased and a much needed stimulus would be provided for expansion of the country's research personnel.

Fifty-three years ago the New York Neurological Institute was organized, the first on this continent. Twenty-eight years ago this Institute was opened, followed soon after by the opening of the Illinois Neuropsychiatric Institute in Chicago. Last Fall a magnificent new 10-storey Institute for Brain Research was opened at the University of California at Los Angeles. Its budget for the current year, incidentally, is just 10 times that of the M.N.I. ! Next Fall, a fifth, the Barrow Neurological Institute, will be dedicated in Phoenix, Arizona. We extend a warm welcome and best wishes to these new sister institutions. To paraphrase Dr. Penfield's closing words in his 1959 report, modern science calls for the effort of many men in long succession. Success depends on concerted action, long continued. These two new Institutes will provide important new facilities for both the continuity and the cooperative and concerted action so necessary in the study of the nervous system and so wisely planned for by the organizers of this Neurological Institute.



## CLINICAL STAFF

### *Director*

THEODORE RASMUSSEN, B.S., M.B., M.D., M.S., F.R.C.S. (C)

### *Honorary Neurosurgeon and Guggenheim Fellow*

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

### *Neurologist-in-Chief*

FRANCIS McNAUGHTON, B.A., M.Sc., M.D., C.M., F.R.C.P. (C)

### *Neurologists*

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

### *Associate Neurologists*

J.B.R. COSGROVE, M.D., M.Sc. (Cantab.)  
REUBEN RABINOVITCH, B.A., M.D., M.Sc.

### *Assistant Neurologists*

BERNARD GRAHAM, B.A., B.Sc., M.D., C.M.  
IRVING HELLER, B.Sc., M.D., C.M., M.Sc.

### *Neurosurgeon-in-Chief*

ARTHUR R. ELVIDGE, M.D., C.M., M.Sc., Ph.D., D.C.L. (Bishop's), F.R.C.S. (C)

### *Neurosurgeons*

GILLES BERTRAND, B.A., M.D., M.Sc., F.R.C.S. (C)  
WILLIAM H. FEINDEL, B.A., M.Sc., D.Phil. (Oxon.), M.D.,  
C.M., F.R.C.S. (C), F.A.C.S.

THEODORE RASMUSSEN

### *Associate Neurosurgeon*

CHARLES BRANCH, B.A., M.D., M.Sc.

### *Assistant Neurosurgeon*

PHANOR PEROT, M.D.

### *Radiologist*

DONALD McRAE, M.D.

### *Associate Radiologist*

ROMÉO ETHIER, B.A., M.D.

### *Neurophysiologist and Consultant in Electroencephalography*

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

### *Electroencephalographer*

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

### *Assistant Electroencephalographer*

DONALD LLOYD-SMITH

### *Anaesthetist*

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

### *Associate Anaesthetist*

G. FREDERICK BRINDLE, B.A., M.D., C.M. (McGill), F.R.C.P. (C)

*Assistant Anaesthetists*

J.J. McGRATH, B.Sc., M.B., B.Ch., B.A.O.  
W.N.C. McCLEERY, M.B., F.F.A.R.C.S.

*Neurochemist and Donner Fellow*

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

*Associate Neurochemist*

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

*Associate Neurochemist and Kenny Foundation Scholar*

LEONHARD S. WOLFE, B.Sc., M.Sc., (N.Z.), Ph.D. (Cantab.), M.D.\*

*Neuropathologist*

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

*Clinical Research Psychologist*

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

\*Appointed Medical Research Council Associate May 1, 1962.

## CONSULTING AND ADJUNCT CLINICAL STAFF

<i>Consulting Pathologist</i> .....	GARDNER C. McMILLAN, M.D., C.M., M.Sc., Ph.D.
<i>Consulting Psychiatrists</i> .....	D. EWEN CAMERON, M.D., F.R.C.P. (C) MIGUEL PRADOS, M.D.
<i>Consulting Neurologists</i> .....	ROMA AMYOT, B.A., M.D. (Montréal and Paris) SYLVIO CARON, M.D., F.R.C.P. (C) GUY COURTOIS, M.D. JEAN-LÉON DESROCHERS, M.D. DAVID HOWELL, M.B., B.S. (Lond.), M.R.C.P. (Lond.) JEAN SAUCIER, B.A., M.D., (Paris and Montréal) WILLIAM TATLOW, M.D. (Lond.), M.R.C.P. (Lond.), F.R.C.P. NORMAN VINER, B.A., M.D., C.M. ARTHUR YOUNG, M.D., C.M., F.R.C.P. (C)
<i>Adjunct Neurosurgeons</i> .....	CLAUDE BERTRAND, B.A., M.D., F.R.C.S. JOHN BLUNDELL, M.A., M.D. (Cantab.), M.R.C.P. (Lond.), F.R.C.S. (E) HAROLD ELLIOTT, B.Sc., M.D., C.M. JEAN SIROIS, B.A., M.D.
<i>Consulting Anaesthetist</i> .....	HAROLD R. GRIFFITH, M.M., B.A., M.D., C.M., F.A.C.A., F.I.C.A., F.F.A.R.C.S. (Eng.), F.R.C.P. (C)
<i>Consulting Research Anaesthetist</i> .....	J. G. ROBSON, M.B., B.Ch. (Glasgow), F.F.A.R.C.S. (Eng.).
<i>Consulting Bacteriologist</i> .....	R. W. REED, M.A., M.D., C.M.
<i>Consulting Radiologist</i> .....	CARLETON PEIRCE, A.B., M.Sc., M.D., F.A.C.P.
<i>Adjunct Radiologists</i> .....	NORMAN M. BROWN, B.A., M.D., C.M. ROBERT FRASER, M.D., F.R.C.P. (C) JEAN L. LEGER, M.D.
<i>Consulting Radiation Therapist</i> .....	JEAN BOUCHARD, M.D., D.M.R.E. (Cantab.)
<i>Consulting Executive Director</i> .....	J. GILBERT TURNER, M.D., C.M., M.Sc., F.A.C.H.A.
<i>Consulting Psychologist</i> .....	M. SAM RABINOVITCH, Ph.D. (Purdue)

## TEACHING STAFF

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

<i>Chairman of Department and Professor of Neurology and Neurosurgery</i> .....	THEODORE RASMUSSEN
<i>Professor of Neurology</i> .....	FRANCIS MCNAUGHTON
<i>Associate Professors</i> .....	PRESTON ROBB DONALD LLOYD-SMITH
<i>Assistant Professors of Neurology</i> .....	J.B.R. COSGROVE REUBEN RABINOVITCH WILLIAM TATLOW DAVID HOWELL
<i>Lecturers in Neurology</i> .....	BERNARD GRAHAM IRVING HELLER
<i>Demonstrators in Neurology</i> .....	J.C. JACOB JOSEPH KEITH ALLAN SHERWIN DAVID WEINSTEIN
<i>Professor of Neurosurgery</i> .....	WILLIAM FEINDEL
<i>Associate Professor of Neurosurgery</i> .....	ARTHUR ELVIDGE
<i>Assistant Professors of Neurosurgery</i> .....	GILLES BERTRAND JOHN BLUNDELL CHARLES BRANCH
<i>Lecturers in Neurosurgery</i> .....	PHANOR PEROT HUGH SAMSON
<i>Demonstrators in Neurosurgery</i> .....	J. G. GYBELS ROSARIO MUSELLA JEWEL OSTERHOLM
<i>Professor of Experimental Neurology</i> .....	HERBERT JASPER
<i>Professor of Biochemistry</i> .....	K. A. C. ELLIOTT
<i>Assistant Professors of Experimental Neurology</i> .....	PIERRE GLOOR LEONHARD S. WOLFE
<i>Lecturer in Experimental Neurology</i> .....	HANNA PAPPUS
<i>Associate Professor of Neurological Radiology</i> .....	DONALD McRAE
<i>Associate Professor of Anaesthesiology</i> .....	RICHARD GILBERT G. F. BRINDLE
<i>Assistant Professor of Neuropathology</i> .....	GORDON MATHIESON
<i>Assistant Professor of Neuropathology</i> .....	BRENDA MILNER
<i>Assistant Professor in Clinical Psychology</i> .....	LLOYD DAYES MANOUCHER GUERAMY
<i>Demonstrator in Electroencephalography</i> .....	LEWIS HENDERSON

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

<i>Professors</i> .....	HERBERT JASPER (Chairman) K. A. C. ELLIOTT WILLIAM FEINDEL FRANCIS MCNAUGHTON THEODORE RASMUSSEN
<i>Associate Professors</i> .....	ARTHUR ELVIDGE DONALD LLOYD-SMITH DONALD McRAE PRESTON ROBB

<i>Assistant Professors</i> .....	GILLES BERTRAND JOHN BLUNDELL J. B. R. COSGROVE HAROLD ELLIOTT PIERRE GLOOR DAVID HOWELL GORDON MATHIESON BRENDA MILNER REUBEN RABINOVITCH WILLIAM TATLOW P. K. THOMAS
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## EXECUTIVE STAFF OF THE MONTREAL NEUROLOGICAL INSTITUTE

<i>Director</i> .....	THEODORE RASMUSSEN
<i>Assistant Director (Hospitalization)</i> .....	PRESTON ROBB
<i>Assistant Director (Scientific)</i> .....	FRANCIS McNAUGHTON
<i>Registrar</i> .....	BERNARD GRAHAM
<i>Assistant Registrar</i> .....	DANICA VANECEK
<i>Business Manager</i> .....	CHARLES NOEL
<i>Executive Secretary</i> .....	MISS ANNE DAWSON

## RESIDENT STAFF — JULY 1961-1962

<i>Senior Neurosurgical Resident</i> .....	JAN GYBELS, M.D. (Belgium)
<i>Senior Neurological Residents</i> .....	J. C. JACOB, M.D. (Vellore, India)* ALLAN SHERWIN, M.D. (McGill)*
<i>Neurological Services</i>	
<i>Teaching Fellows</i> .....	JOSEPH KEITH, M.D. (Louisville) DAVID WEINSTEIN, M.D. (Louisville)
<i>Fellow in Paediatric Neurology</i> .....	YAVUZ RENDA, M.D. (Ankara, Turkey)
<i>(Montreal Children's Hospital)</i>	Rockefeller Fellow
<i>Residents</i> .....	GARTH EMBREE, M.D. (Halifax) RAYMOND GIGUÈRE, M.D. (Laval)* J. C. JACOB, M.D. (Vellore, India)* ROBERT MCPHEDRAN, M.D. (Toronto)
<i>Assistant Residents</i>	
P. DROUIN, M.D. (Laval)*	R. GIGUÈRE, M.D. (Laval)*
N. GIARD, M.D. (Montreal)*	M. HEUFF, M.D. (Victoria, B.C.)* J.M. ST. HILAIRE, M.D. (Laval)
<i>R. V. H. Rotators</i>	
S. CANTLIE, M.D.	M. JOHNSON, M.D.
B. DAVIS, M.D.	W. MAY, M.D.
P. DAVIS, M.D.	W. MCPHERSON, M.D.
A. DUFF, M.D.	H. ROBSON, M.D.
R. FUNG, M.D.	F. SAKSANA, M.D. G. STEINER, M.D.
<i>M. G. H. Rotators</i>	
J. DOLOVICH, M.D.	J. JEPSON, M.D.
J. W. HARTHORNE, M.D.	N. ROSMAN, M.D.

\*Six months on this service.





*Top Row:* Drs. P. DROUIN; M. St. HILAIRE; R. GIGUÈRE; P. POLIZOS; G. KARPAT; L. DAYES; J. KEITH; J. C. JACOB;  
 R. HERNDON; D. POLLEN; MR. K. REID; MR. N. RUMIN; DR. Y. RENDA.  
*Second Row:* Drs. O. SEMCHISHEN; F. POIRIER; M. SPENCE; J. LOWDEN; H. GARRETSON; O. KALABAY; N. GIARD;  
 F. REDDING; L. MARCO; MR. R. LOVELL; MR. F. BILODEAU; DR. L. YAMAMOTO.  
*Third Row:* Drs. J. BLUNDELL; P. PEROT; R. ETHIER; J. McGRATH; W. McCLEERY; MRS. CLARA STRAUSS;  
 Drs. F. ANDERMANN; BRENDA MILNER; C. STEFANIS; CATHERINE MACPHERSON; C. BRANCH.  
*Fourth Row:* Drs. G. BERTRAND; D. LLOYD-SMITH; P. GLOOR; D. McCRAE; K. A. C. ELLIOTT; I. HELLER; HANNA PAPIUS;  
 L. WOLFE; A. MORTON; G. MATHIESON; J. B. R. COSGROVE; P. ROBB.  
*Fifth Row:* Drs. R. RABINOVITCH; A. YOUNG; J. GILBERT TURNER; F.L. McNAUGHTON; DEAN L. STEVENSON; DR. T.  
 RASMUSSEN; PROF. RAYMOND D. ADAMS; Drs. M. FEINDEL; W. PENFIELD; MISS B. CAMERON; MISS C. GRIFFIN;  
 DR. A. ELVIDGE.  
*Bottom Row:* Drs. G. EMBREE; R. MCPHEDRAN; B. BARONE; R. MUSELLA; D. BHATHAL; M. GUERAMY; I. OSTERHOLM;



*Neurosurgical Services*

*Residents* ..... V. J. DAVE, M.D. (Jodhpur, India)\*  
D. GONZALES, M.D. (Mexico)\*  
ROSARIO MUSELLA, M.D. (Naples,  
Italy)\*  
JEWEL OSTERHOLM, M.D. (St. Louis)\*

*Assistant Residents*

B. BARONE, M.D. (Chicago) G. KARPATI, M.D. (Dalhousie)\*  
D. BHATHAL, M.D. (India)\* F. MAROUN, M.D. (Lebanon)  
M. FELT, M.D. (Salt Lake City)\* R. MUSELLA, M.D. (Naples, Italy)\*  
H. GARRETSON, M.D. (Arizona)\* J. OSTERHOLM, M.D. (St. Louis)\*  
M. GUERAMY, M.D. (Iran)\* O. SOLIS, M.D. (Mexico)\*

\*Six months on this service.

LABORATORIES AND DEPARTMENTS

ANAESTHESIA

*Anaesthetist* ..... RICHARD G. B. GILBERT, M.B., B.S. (Lond.),  
F.R.C.P. (C), D.A., R.C.S. & R.C.P.,  
F.F.A.R.C.S., F.A.C.A.

*Associate Anaesthetist and  
Research Associate* ..... RONALD A. MILLAR, M.D., Ch.B. (Edin.),  
M.Sc., F.F.A.R.C.S. (Resigned Oct. 1).

*Associate Anaesthetist* ..... G. F. BRINDLE, B.A., M.D., C.M. (McGill),  
F.R.C.P. (C).

*Assistant Anaesthetists* ..... J. J. McGRATH, B.Sc., M.B., B.Ch., B.A.O.  
(Oct./July)  
W. N. C. McCLEERY, M.B., F.F.A.R.C.S.  
(July/Oct.)

*Resident Staff*

D. L. BOYD, M.D. (Queens)\* MARCEL JACOB, M.D. (Laval)\*  
D. E. CROWELL, M.D. (McGill)\* ANDRE JOYAL, M.D. (Univ. of Mtl.)\*  
S. DASGUPTA, M.D. (Calcutta) A. C. KELLY, M.D. (Dalhousie)\*  
Colombo Plan (4 mos.) A. PENALOZA, M.D. (Mexico)\*  
RUTH FERGUSON, M.D. (Edinburgh)\* D. O. TIRKES, M.D. (Istambul) (5 mos.)

*Nurse in Charge of Anaesthetic Rooms* ..... HELEN CALLANDER, R.N.

\*Six months on this service.

## ELECTROENCEPHALOGRAPHY AND ELECTROMYOGRAPHY

<i>Electroencephalographer</i> .....	PIERRE GLOOR, M.D., Ph.D.
<i>Consultant in Electroencephalography</i> .....	HERBERT JASPER, Ph.D., D.ès Sci., M.D., C.M.
<i>Assistant Electroencephalographer</i> .....	DONALD LLOYD-SMITH, B.Sc., M.D., C.M., F.R.C.P. (C)
<i>Consultant in Electromyography</i> .....	PETER K. THOMAS, M.D., B.Sc. (Anatomy)
<i>Electroencephalographic Fellows:</i>	
PATRICE DROUIN, M.D. (Montreal)*	ORHAN KALABAY, M.D. (Istanbul, Turkey)
MILAN FELT, M.D. (Salt Lake City)*	GEORGE KARPATI, M.D. (Montreal)*
HENRY GARRETSON, M.D. (Arizona)*	ISRAEL LIBMAN, M.D. (Montreal)*
NORMAN GIARD, M.D. (Montreal)*	FERNAND POIRIER, M.D. (Montreal)*
DES RAJ GULATI, M.D. (Colombo Plain Fellow) (3 mos.)	MISS LILY PRISKO (Part-time)
J. C. JACOB, M.D. (Vellore, India)	
<i>Electromyography Fellow:</i> .....	COSTAS STEFANIS, M.D. (Athens, Greece)*
<i>Chief Technician and Demonstrator</i> .....	LEWIS HENDERSON, Jr.

## NEUROCHEMISTRY

(DONNER LABORATORY AND CLINICAL LABORATORY)

<i>Neurochemist and Donner Fellow</i> .....	K. A. C. ELLIOTT, M.Sc., Ph.D., Sc.D.
<i>Associate Neurochemist</i> .....	HANNA M. PAPIUS, M.Sc., Ph.D. (McGill)
<i>Associate Neurochemist and Medical Research Council Associate</i> .....	
	LEONHARD S. WOLFE, M.Sc., (N.Z.), Ph.D. (Cantab.), M.D.
<i>Assistant Neurochemist, Clinical Fellows:</i> .....	IRVING HELLER, M.D., C.M., M.Sc.
FERNAND BILODEAU, B.A., B.Sc. (Montreal) National Research Council Studentship	R. A. LOVELL, M.S. (Indiana) Pre-doctoral Research Fellowship, U.S.P.H.S.
J. A. LOWDEN, M.D. (Toronto) Queen Elizabeth II Fellow	

## NEUROPATHOLOGY

<i>Neuropathologist</i> .....	GORDON MATHIESON, M.B., Ch.B., M.Sc.
<i>Assistant Neuropathologist</i> .....	GILLES BERTRAND, B.A., M.D., M.Sc.
<i>Research Associate</i> .....	ANDRZEJ GLUSZCZ, M.D. (Lodz, Poland) Rockefeller Fellow
<i>Fellows:</i>	
BARTOLO M. BARONE, M.D. (Chicago)	ROBERT HERNDON, M.D. (Detroit)
DIWAN BHATHAL, M.D. (Manilla, Philippines)*	MARIUS HEUFF, M.D. (Holland, via Victoria, B.C.)*
STIRLING CARPENTER, M.D. (Burlington, Vermont)	POLIZOES POLIZOS, M.D. (Athens, Greece, via Brooklyn)
LLOYD DAYES, M.D. (Jamaica)	ORLANDO SOLIS, M.D. (Mexico, via Queen Mary Veterans' Hosp.)*
GARTH EMBREE, M.D. (Halifax)	MATTHEW SPENCE, M.D. (Alberta, via Queen Mary Veterans' Hosp.)
MANOUCHER GUERAMY, M.D. (Shiraz, Iran)	
<i>Chief Technicians</i> .....	JOHN GILBERT BARBARA NUTTALL, B.A.

## NEUROANATOMY

<i>Neuroanatomist</i> .....	FRANCIS L. McNAUGHTON, B.A., M.Sc., M.D., C.M.
<i>Fellows</i> .....	JOHN BLUNDELL, M.A., M.D. (Cantab.), M.R.C.P. (Lond.), F.R.C.S. (Eng.) ALLAN MORTON, M.D., C.M., M.Sc.
	(McGill)

### CONE LABORATORY FOR NEUROSURGICAL RESEARCH

<i>Director</i> .....	WILLIAM H. FEINDEL, B.A., M.Sc., D.Phil. (Oxon.), M.D., C.M., F.R.C.S. (C), F.A.C.A.
<i>Research Fellow</i> .....	HENRY GARRETSON, B.Sc., M.D.
<i>Research Associates</i> .....	MR. NICHOLAS RUMIN, B. Eng., M.Sc. (McGill).
	LUCAS YAMAMOTO, M.D., Ph.D. (Hokahama), via Hokkaido, Japan, Georgetown Univ. and Brookhaven National Laboratory.
<i>Research Assistant</i> .....	MR. ROBERT STOLK, (n.i), Delft, Holland

## NEUROPHYSIOLOGY

<i>Neurophysiologist</i> .....	HERBERT JASPER, Ph.D., D.ès Sci., M.D., C.M.
<i>Assistant Neurophysiologist</i> .....	PIERRE GLOOR, M.D., Ph.D.
<i>Fellows:</i>	
ROBERT CARUTHERS, Ph.D. (U.S.A.)	PHANOR PEROT, M.D. (Tulane), (U.S.P.H. Fellow)
DES RAJ GULATI, M.D. (Punjab, India) (Colombo Plan Fellow)*	DANIEL POLLEN, M.D. (Boston)
HENRY GARRETSON, M.D. (Arizona)*	FOSTER REDDING, M.D. (Phila.) Research Associate (U.S.P.H. Fellow)
LUIS MARCO, M.D. (Valencia, Spain)	KENNETH REID, M.Sc. (Montreal) Research Associate
MORIO MATSUNAGA, M.D. (Kyoto, Japan)*	JEAN SIEGFRIED, M.D. (Geneva) Fellow of Swiss Acad. Med. Sciences.
HERBERT MÜLLER, M.D. (Germany)	COSTAS STEFANIS, M.D. (Athens, Greece)*
KAROLA MÜLLER, M.D. (Germany)	
<i>Nurse in Charge of Neurophysiology Rooms</i> .....	MARY ROACH, A.R.R.C., R.N.

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<i>Assistant Photographer</i> .....	JEAN GARNEAU
<i>Illustration Technician</i> .....	MRS. S. KALABY

## RADIOLOGY

<i>Radiologist</i> .....	DONALD McRAE, M.D.
<i>Associate Radiologist</i> .....	ROMEO ETHIER, M.D.
<i>Residents</i>	
TERRENCE P. CONNOR, M.D. (U.K.)	JACQUES RACINE, M.D. (Canada)
PIERRE FAUTEUX, M.D. (Canada)	O. M. SEMCHISHEN, M.D. (Canada)
RICHARD KEOGH, M.D. (Vancouver)	JEAN VEZINA, M.D. (Canada)
<i>Chief Technician</i> .....	JOAN BROADLEY, R.T.

\*Six months on this service.



## RESEARCH IN MULTIPLE SCLEROSIS

<i>Chief</i> .....	J. B. R. COSGROVE, M.D., M.Sc.
<i>Immunochemist and Research Associate</i> .....	CATHERINE MCPHERSON, Ph.D. (Columbia) B.Sc., M.Sc.
<i>Technicians</i> .....	RICHARD GRENIER, B.Sc. MRS. EVA MEHLHOSE

## PSYCHOLOGY

<i>Clinical Research Psychologist</i> .....	BRENDA MILNER, B.A., M.A. (Cantab.) Ph.D.
<i>Research Associate</i> .....	DOREEN KUMURA, M.D. (Montreal) U.S.P.H. Fellow
<i>Research Assistant</i> .....	MR. L.B. TAYLOR (Montreal)
<i>Graduate Student in Psychology</i> .....	MISS SUZANNE HAMMOND (Hartford)

## NURSING STAFF

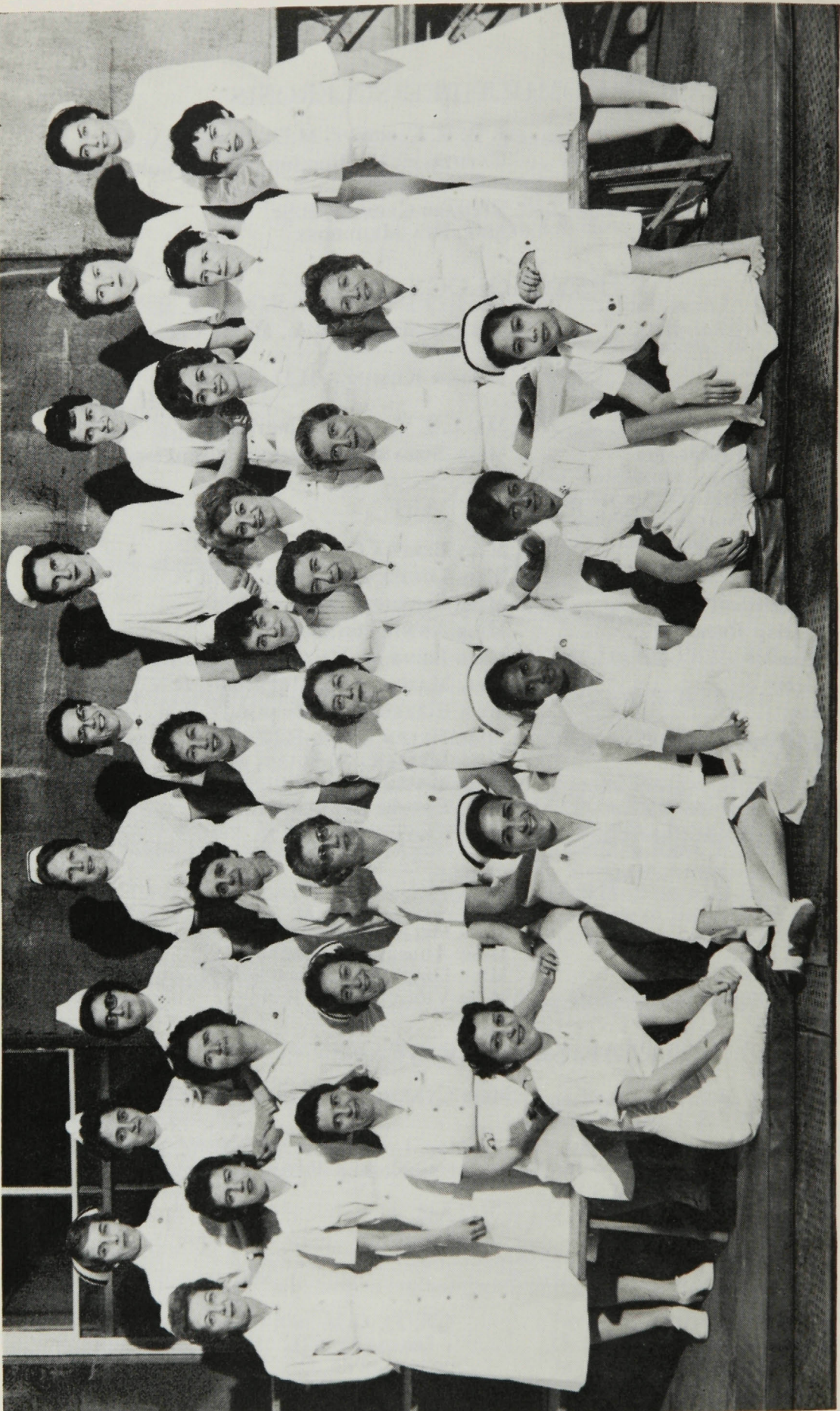
<i>Director of Nursing</i> .....	MISS BERTHA CAMERON, R.N.
<i>Assistant Director of Nursing</i> .....	MISS LOUISE HALL, B.N., R.N.
<i>Administrative Assistant</i> .....	MRS. ELEANOR CARMEN, N.S.
<i>Supervisor Dressing Rooms</i> .....	MISS ANNIE JOHNSON, R.N.
<i>Educational Director</i> .....	MISS IRENE McMILLAN, B.A., R.N.
<i>Clinical Instructor</i> .....	MRS. MAUREEN M. McINTOSH, R.N.
<i>Night Supervisor</i> .....	MRS. ELIZABETH BARROWMAN, R.N.
<i>Assistant Night Supervisors</i> .....	MISS HELEN KRYK, R.N. MISS LILLIAN McAULEY, R.N. MISS MARILYN MANCHEN, R.N.
<i>Operating Room Supervisor</i> .....	MISS PHOEBE STANLEY, R.N.
<i>Assistant Operating Room Supervisor</i> .....	MISS EVELYN BAIN, R.N.

## HEAD NURSES

MISS EVELYN ADAM, R.N.	MISS HELEN DANAHER, R.N.
MISS M. AGNEW, R.N.	MISS AUDREY KIMBERLEY, R.N.
MISS ALICE CAMERON, R.N.	MISS DELTA MacDONALD, R.N.
MISS MARY CAVANAUGH, R.N.	MISS VIOLA STORLE, R.N.

## SOCIAL SERVICE STAFF

<i>Director</i> .....	MISS CYNTHIA GRIFFIN, B.A., M.S.
<i>Social Workers:</i>	
MISS KATHLEEN MacDONALD, B.A., B.S.W.	MRS. LILLIANE POTEET, B.A., M.S.W. MISS NOELLA VAILLANCOURT, B.A., M.S.W.
MISS IRENE PAULSON, B.A., M.S.W.	



*Top Row:* R. ARASON; J. LANTHER; P. PELOQUIN; S. TASKARI; D. TURNER; T. AARSETH; H. DANAHAR; D. MACKINNON;  
 E. BAIN.  
*Second Row:* A. CAMERON; B. HARVEY; A. HAM; R. BOYER; Y. VOULLAIRE; A. MORGAN; M. AGNEW; P. ROBERTSON;  
 M. CAVANAUGH; B. HOLMES.  
*Third Row:* M. MCINTOSH; P. STANLEY; E. BARROWMAN; B. CAMERON (Director); L. HALL; I. MACMILLAN; E. CARMEN.  
*Bottom Row:* M. PROVENCER; V. MOROZ; S. SWAMINATHAN; H. BELANGER; L. NACKMANEE.

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# APPOINTMENTS HELD IN TEACHING HOSPITALS OF MONTREAL

## ROYAL VICTORIA HOSPITAL

<i>Neurologist and Neurosurgeon-in-Chief</i> .....	THEODORE RASMUSSEN
<i>Honorary Consultants</i> .....	ARTHUR R. ELVIDGE WILDER PENFIELD
<i>Honorary Attending Neurologist</i> .....	ARTHUR YOUNG
<i>Neurologists</i> .....	FRANCIS MCNAUGHTON PRESTON ROBB DONALD LLOYD-SMITH
<i>Associate Neurologists</i> .....	J. B. R. COSGROVE REUBEN RABINOVITCH
<i>Assistant Neurologists</i> .....	BERNARD GRAHAM IRVING HELLER
<i>Clinical Assistant in Neurology</i> .....	DANICA VENECEK
<i>Neurosurgeons</i> .....	GILLES BERTRAND WILLIAM FEINDEL
<i>Assistant Neurosurgeon</i> .....	CHARLES BLUNDELL
<i>Clinical Assistant in Neurosurgery</i> .....	PHANOR PEROT
<i>Consultant in Charge of Electroencephalography and Electromyography</i> .....	HERBERT JASPER
<i>Physician in Charge of Electroencephalography and Electromyography</i> .....	PIERRE GLOOR
<i>Associate Radiologist</i> .....	DONALD McRAE
<i>Anaesthesia — Honorary Consulting Staff</i> .....	R. G. B. GILBERT

## MONTREAL GENERAL HOSPITAL

<i>Member of Consulting Staff</i> .....	HAROLD ELLIOTT
<i>Consultants in Neurosurgery</i> .....	ARTHUR ELVIDGE WILDER PENFIELD
<i>Consultants in Neurology</i> .....	FRANCIS L. MCNAUGHTON PRESTON ROBB
<i>Consultant in Electroencephalography</i> .....	HERBERT H. JASPER
<i>Neurosurgeon</i> .....	HUGH SAMSON
<i>Associate Neurologist</i> .....	WILLIAM TATLOW
<i>Assistant Neurologists</i> .....	DAVID HOWELL PETER THOMAS

## MONTREAL CHILDREN'S HOSPITAL

<i>Consultants</i> .....	GILLES BERTRAND ARTHUR ELVIDGE HERBERT JASPER FRANCIS L. MCNAUGHTON DONALD McRAE THEODORE RASMUSSEN
<i>Honorary Consulting Staff</i> .....	M. SAM RABINOVITCH
<i>Director — Neurology and Cerebral Palsy Division</i> .....	PRESTON ROBB
<i>Director — Neurosurgery</i> .....	JOHN BLUNDELL, M. A., M.B., B.Chir., M.D.

# REPORT OF THE NEUROLOGIST

DR. FRANCIS L. McNAUGHTON

Once again, it is my privilege to present the report of the Department of Neurology.

Our admissions in 1961 again constituted almost half the total admissions to the Institute, but with a slight reduction in actual numbers, when compared with 1960.

In July of last year, the two clinical services were re-organized into three, each with its Visiting Staff, Resident, and two Assistant Residents. After nearly a year of operation, we are satisfied that this has been a forward step. It allows a fairer distribution of clinical duties among the resident staff and means better care for the individual patient.

The training program in Neurology has continued along similar lines to last year, with the helpful cooperation of all the special departments and also of Dr. Sean Murphy and Dr. Jacques Susset of the Royal Victoria Hospital. We are pleased that the U.S. Public Health Training Grant in Neurology has been renewed for a further period of 3 years. While this grant is primarily designed to assist in the training of U.S. citizens, it has contributed very materially to the organization of the training program, and benefits all our resident staff.

In the out-patient services of the Royal Victoria Hospital, there was a distinct rise in new patients, from 471 in 1960 to 567 in 1961, an increase of 96, and an increase of 521 in the number of visits by old patients. The Seizure Clinic has continued to grow and to benefit from the support of the Federal-Provincial-Rehabilitation Grant. Dr. Frederick Andermann, and the new Secretary, Mrs. Roach, are doing a splendid job of re-organizing the clinic and its records, and Miss Paulson in planning an extensive social survey among the Seizure patients. It is gratifying to note in passing, that plans are moving ahead for a Community organization in Montreal for the orientation and rehabilitation of persons with Epilepsy, with backing from many influential groups, including the Neurologists of the Montreal area.

I wish to commend the splendid work of this year's Residents, Dr. Allan Sherwin, Dr. Garth Embree, Dr. Raymond Giguère, and Dr. Robert McPhedran; also the work of the two teaching fellows, Dr. David Weinstein and Dr. Joseph Keith. They have contributed to the everyday life of the Institute in a great many ways, as have their hard-working and loyal Assistant-residents.

In January, the department welcomed a new member, Dr. Peter Thomas, who has joined the staff of the Montreal General Hospital and of this Institute. He comes to us from the National Hospital, Queen Square, London, and will bring new strength to the department. We are also happy to welcome

Dr. Allan Sherwin to the Staff, and to congratulate him on his recent award of a Markle Scholarship. I must also congratulate Dr. Irving Heller, who has been awarded his Ph.D. in Experimental Neurology at McGill University.

Each year we take pleasure in the teaching visits of eminent neurologists from other world centres, and we all profit greatly by their experience and by the personal contacts which are established. Among those who have visited us during 1961-62 have been Dr. Paul Castaigne of Paris, Dr. Roger Gilliatt of London, Dr. Gavin Glasgow and Dr. Jack Bergin of New Zealand, and from friendly Boston, Dr. Derek Denny-Brown, Dr. Paul Yakovlev, Dr. Miller Fisher, and this week, Dr. Raymond Adams, our Hughlings Jackson Lecturer.

During the past year, the neurologists and neurosurgeons of Canada have been doing some soul-searching among themselves, while preparing a Brief for the Royal Commission on Health Services in Canada. They have been trying to think and plan the place of neurology and neurosurgery in Canada during the next quarter century. Largely due to the work of Dr. Preston Robb, the Secretary of the Canadian Neurological Society, an excellent study has been submitted to the Commission, which should be required reading for every neurologist and neurosurgeon in Canada. His report points out the shortcomings of our present situation, and calls for more, and better facilities for the care of patients with neurological disorders, better training and research facilities in the University centres across Canada, and greater support and planning of basic research in the Nervous System, in health and disease.

As we meet here today, we should recognize our special share of responsibility in carrying out these recommendations, and should consider our own plans against the background of Canada's future needs, not to mention the needs of other areas of the world less developed than our own.

## REPORT OF THE NEUROSURGEON

DR. ARTHUR R. ELVIDGE

During the year 1961 the Neurosurgical Department has carried out 1,076 operative procedures. This does not include minor surgery performed in the various dressing rooms. Of the total there were 244 major craniotomies and of these 102 were performed for cerebral tumour and 64 primarily for epilepsy. Major cranial surgery was required in 79 of 356 patients admitted for trauma. There were 223 spinal operations including 129 discectomies and 331 arteriograms were performed, including 17 aortograms.

The number of operations which reached a high peak last year has been maintained. There have been no recorded operative infections during the year. For this we have to thank our fine staff nurses, under the direction of Miss Phoebe Stanley, for their vigilance and technical excellence. One adds with enthusiasm thanks to the care and skill of our residents in maintaining this enviable record.

The post-operative nursing care and the general nursing care are undertaken by expert ward nurses who must receive praise and admiration. They have helped to save many lives and made others happier. In spite of being short-staffed, they have set standards which are hard to equal and others find would copy.

We are fortunate to have such an efficient and helpful Department of Anaesthesia, under the direction of Dr. R.G.B. Gilbert, where modern techniques are continually improved to make anaesthesia safer and less unpleasant for the patient.

During the year 1961 there were 1,223 direct admissions to the three neurosurgical services, and 115 transfers to neurosurgery making a total of 1,338 patients treated, comparable but slightly fewer than last year. As beds are limited one cannot increase the number of patients treated indefinitely unless an outlet is made for the patients requiring prolonged convalescence.

Outdoor Clinics are held Tuesday, Wednesday and Thursday afternoons. There were 187 new patients and 823 re-visits, a total of 1,010 patient visits during the year.

During the academic year 1961-62 our activities have been enriched by our residents who again have come from near and far and include the United States, Belgium, Iran, Italy, Mexico, India, Lebanon, Hungary. During this year Dr. Phanor Perot, previously senior resident, joined the staff on the third neurosurgical service. Dr. Vijay Dave has returned to Jahore, India, to do neurosurgery. Dr. Jesse Barber is now a busy Neurosurgeon-in-Charge at Howard University, Washington, D.C. Dr. Richard Rovit is established at Jefferson University in Philadelphia. Dr. John Blundell has organized his neurosurgical service at the Montreal Children's Hospital. Dr. Prakash Tandon has taken up the practice of neurosurgery in Lucknow, India. Dr. Gulati is Associate Professor of Neurosurgery in Amritsar, Punjab. Dr. D. Gonzales has returned to Mexico as neurosurgeon to the Children's Hospital.

To mention former neurosurgical residents, recently contacted, Dr. Tazari is well established in Jordan. Dr. Levy is the ranking neurosurgeon in the Rhodesias. Dr. John Hunter is organizing a Neurosurgical Department in Hong Kong. He has sent his operating nurse, Miss Mary Young, for a year's post graduate training to this Institute and she is here to-day. Dr. Maitland Baldwin is Clinical Director of the National Institutes of Health, Bethesda, and Dr. Van Buren, Associate Neurosurgeon. Dr. Fuad Haddad, neurosurgeon in Lebanon, was Secretary-General of the Middle East Medical Society last year, and Dr. Penfield delivered the first of the Wilder Penfield lectures at the American University of Beirut. Dr. Martinez-Coll is Chief of the Clinic at the Hospital Vargas and their new school of medicine in Caracas.

The neurosurgeons in spare time have joined in the research which proceeds in the laboratories, wards and operating rooms. The investigation of cerebral convulsive disorders in all its ramifications is and will be a continuing problem on the clinical, physiological and chemical side. Fought over the years

by Dr. Penfield the battle continues under the wise guidance of our Director, Dr. Rasmussen. The automatic scanner, using radioactive isotopes, which was introduced from Saskatoon by Dr. Feindel, has been kept busy this year and is proving its worth. Some early attempts are being made by Drs. Feindel, Perot, Garretson, Yamamoto, and Mr. Rumin to study circulation time in certain lesions using tracer isotopes in the operating room. Dr. Perot has made a study of the conditions required for the production of spike and wave discharges in the brain and has started work on microelectrode recording in seizure cases.

Dr. Bertrand is studying the pathophysiology of nerve root conduction and continues with problems concerned with neuropathology and stereotaxy. Dr. Branch is making studies on the lateralization of speech. Dr. Brenda Milner, psychologist, has continued to enrich our Neurosurgical Department with investigations into the intricate mechanism of memory.

During the year we have enjoyed their cooperation and association, and have learned much from our colleagues in neurology and radiology and other fields.

It is a great privilege to thank all those who have contributed to the activities of the Department of Neurosurgery.

## REPORT OF HOSPITAL SERVICES

DR. PRESTON ROBB

To report completely on the activities of the hospital for the year 1961 would be a lengthy affair indeed. It was an eventful year. Patients were admitted and discharged, grateful that they were not confronted with an overwhelming bill and unaware of the tremendous administrative problems and turmoil that was going on behind the scenes.

### *Hospital Statistics*

During the year 1961, 2,146 patients were admitted; 1,223 admitted to neurosurgery, 1,193 admitted to neurology. There were 46,485 patient days, some 1,205 more than the previous year. The average occupancy was 94.2% and the average stay was 19.35 days. There were 116 deaths, a death rate of 4.8% and an autopsy rate of 82.8%. There were 1,076 operations and no post-operative infections.

There would be no point in compiling statistics unless one examined them and tried to determine their significance. First, the demand to have patients admitted to the Institute continues, and our waiting list is at an all time high. Secondly, the staff has worked hard. 94.2% occupancy is a dangerous level and is only maintained by hard work on everyone's part. The average length of stay has crept up one day over 1960. I do not believe this is entirely related to the Quebec Hospital Insurance Plan as much as to the difficulty in placing the chronically ill. It has been stressed before, and we stress it again; there is an urgent need for beds for the chronically ill, and,

as well, beds where patients requiring intensive rehabilitation can be admitted for treatment. We have nothing but praise for the excellent work of Dr. Sowden and his team of therapists, but it does not make sense to keep patients in the Institute when they would be better off in a Rehabilitation Ward.

### *Outpatient Clinics*

The Outpatient Clinics are held in and operated by the Royal Victoria Hospital. They are manned by our staff members and residents. There has been a steady increase in their work. In the neurology clinic there was a total of 4,648 patient visits, an increase of 611 over 1960. In the neurosurgery clinic, 1,010 patient visits, an increase of 97 over 1960. As well, the resident staff cooperated with the emergency clinic, answering calls at all times, day or night.

We are all aware of the rumors and election talk that before long there will be a complete health insurance scheme. Medical care will be "free" to all. Already doctors and government are locked in battle in Saskatchewan. With the pending federal election, we hear of new schemes. At the same time, in Quebec, we are told that there is not sufficient money available to operate the hospitals at a first class level. Would it not make sense for the government to support Outpatient Clinics to the limit. This would ensure medical care for the indigent. It would ease the pressure on hospital beds, and at the same time would not launch the government on a fantastically expensive scheme which would only lead to higher taxes, and unhappiness all around. The gradual financing of diagnostic services on an outpatient basis would do much to ease the load on both patients and hospital.

### *Nursing*

From the time the Institute first opened its doors, the nursing care of the patient was paramount in importance. Under the leadership of Miss Flanagan, new techniques were developed and the nursing reputation of the Institute became known around the world. In September, Miss Flanagan retired—at least temporarily from nursing—to take up law. Miss Bertha Cameron became Director of Nursing. Following in the footsteps of Miss Flanagan is no easy task, but Miss Cameron is aquitting herself well, and maintaining the tradition of the Institute. Representing the doctors, I may say that we are grateful to all the nurses for their part in looking after our *very* difficult patients.

### *Records*

A big event in 1961 was the renovation of the typing pool. It is hard to believe that the old quarters could be made over into a new and pleasant room. If we could only learn to heat it in the winter, it would be a veritable paradise.

By means beyond my comprehension, Mrs. von Nida has been able to maintain her staff and the steady flow of records through the Registrar's Office. As well as records and correspondence related to patients, the Registrar's Office is a busy place. Anyone with a problem seems to gravitate there. It may be finding a room, getting meal tickets, or helping some poor interne in distress. She runs a private Social Service Department available to all.



### *Building Maintenance*

The year 1961 would be known as the year the road was fixed. During most of the summer the road was dug up, new sewers and power lines were laid. Parking was even more difficult than usual and now they are at it again. I hope, for the last time.

An extensive painting program was carried out, and I am happy to report that we now have a full time painter of our own. Already his effective work has done much to improve the general appearance of the Institute. With the help of a gift from a generous patient, the sitting rooms on Four East have been refurnished. We are grateful to Mr. Cunningham and his staff for the support they have given us. We recognize what a difficult building this is to maintain and the many emergency demands that are made on the Department of Buildings and Grounds. To all who have so willingly helped out in the daily repairs and maintenance, we express our appreciation.

### *Finance*

A year ago, I speculated on some of the problems facing us under the Quebec Hospital Insurance Services. 1961 has now passed, and we are still trying to adjust our losses.

To operate the Institute in 1961, it cost \$1,747,839. After all sources of income to date have been added up, there remains a deficit of \$57,141. It is still hoped that we may recover a large part of this from the Quebec Hospital Insurance Service. The budget for 1962 has been submitted and reviewed by Quebec. There was a 30% cut. In a word, this is ridiculous. We cannot operate on the amounts allowed, and again we must struggle through the year without knowing how much we can spend. We have never apologized for the quality and quantity of our nursing care. The reputation of this Institute is built on the best in medical, surgical, and nursing care. It has always been expensive. I want to assure you, that regardless of the pressures to reduce costs, we shall not lower our standards.

The government must continue to recognize that this is not just a 135-bed hospital to be compared to a general hospital, but an Institute dedicated to the "Relief of Sickness and Pain", where desperately sick people are treated, an Institute that has provided leadership in the field of neurology throughout Quebec, Canada, and the world.

## REPORT OF THE NURSING DEPARTMENT

MISS BERTHA I. CAMERON

The past year has been a very active one for the Nursing Department from the viewpoint of both patient care and teaching. We have endeavoured to give our patients the desired high standard of nursing care, using our staff as efficiently and economically as possible.

However, since April 1st, when the 5-day (40-hour) work week began and added personnel were needed to plan for time off, we have been unable

to get the desired number of general staff nurses to carry out the quality of nursing we consider essential.

To overcome the shortage, we found it necessary to employ General Staff Relief nurses paid on a daily basis and more nursing assistants. For a long period, it was necessary to keep 2 North closed.

Although we *do* have many nursing assistants on our staff who are well trained (most of them trained on the job), we found that many of those newly employed had little or no training. Training nursing assistants on the job means an added load on the nursing staff. However, as they do have a definite place and are of great value in helping with the nursing care of our type of patient, it is most essential that they be properly trained. A wider knowledge of patient care would be of great benefit so that they could be given more responsibility and be qualified to accept it.

Because of changing times in which we presently live and the faster "jet service" there seems to be a certain restlessness in the nursing profession. Nurses do not remain "put" for long—instead are interested in moving on to see the world. This has been a serious problem to all hospitals.

Through our advertisements in Nursing Journals, there are a constantly increasing number of inquiries about our Postgraduate Course. Graduate nursing students from many parts of Canada and all over the world enter our classes in April and October. During the year, certificates were presented to 35 Postgraduate nurses and I am pleased to say that a goodly number remained with us to gain further knowledge and experience.

The *first* Eileen C. Flanagan prize was presented to Miss Shirley Jaskari, who was the most outstanding nurse in the October Postgraduate Class. This prize is given from a Scholarship Fund which was established by nurses who had worked with Miss Flanagan, to honour to her upon her retirement as Director of Nursing and to pay tribute to her excellent contribution to nursing generally and at the Montreal Neurological Institute in particular.

The Teaching Department, under the direction of Miss Irene MacMillan and Instructor Mrs. M. McIntosh, has been very active. Much interest has been stimulated with rewarding results. It is important that each nurse consider herself as a teacher. The demands on the nurse's skill are ever increasing, so she must keep herself qualified and in touch with the times.

We had 129 undergraduate students from the Royal Victoria School of Nursing and 4 from the McGill Basic Course in Nursing. I am also happy to say that 8 Postgraduate nurses came here for "field" experience from McGill.

During the year a new residence at 542 Pine Avenue was opened for nurses. It has been tastefully decorated and the nurses are very happy in it. We hope that the Residence on University Street can also be decorated and brought up to the standard of this new home.

We have to thank the members of St. George's Lodge No. 10 for their generous donation of One Thousand Dollars to be used as a Nursing Bursary.

We would also like to thank Mrs. Samuel Reitman for the Nursing Bursary in memory of Dr. William V. Cone which was awarded to Miss Caroline Robertson, and the Women's Auxiliary for the Nursing Bursary which was awarded to Miss Patricia Murray. These nurses are pursuing graduate courses at the School for Graduate Nurses, McGill University.

Miss Gillian Buxton-Payne was awarded the prize given by the Montreal Neurological Institute to the Royal Victoria student showing aptitude and interest in Neurological and Neurosurgical Nursing while affiliating here.

Finally, may I say to the entire staff how much I appreciate the loyalty shown and the help given to me since I became Director of Nursing upon Miss Flanagan's retirement last Fall.

## SOCIAL SERVICE DEPARTMENT

MISS CYNTHIA GRIFFIN

Although so much of our activity is on behalf of patients in the Montreal area, we too reflect the farflung service of the Institute, as we have helped patients from distant parts of Quebec, from 5 other provinces, from several states of the United States and from Bermuda. Our program may be divided into direct and indirect service to patients. Direct service is primarily through social casework (or counselling) to individual patients and families, but also through providing an opportunity to patients for group discussion of mutual problems. Indirect service includes participation in studies and in community planning projects with the ultimate object better care for patients.

Let us take a glimpse at some of the activities of the department through the eyes of one of the social workers. The vast majority of the patients in her case-load were referred by the medical staff, the remainder by nurses, patients or family members, and community agencies. Requests for assistance fell mainly under the broad heading — “discharge planning”, but with subdivisions: patients returning to their own homes, but needing financial assistance for equipment or for home treatment; other patients unable to return to their homes and needing help with plans for appropriate placement. Quebec Hospital Insurance covers three placement categories: those needing a full program of rehabilitation; those with an element of rehabilitation, but needing only physiotherapy; and the chronically ill with no element of rehabilitation but needing professional nursing care and regular medical care. For a fourth category, patients requiring custodial care, another source of payment must be found—either from the patient group or the Department of Social Welfare, which requires a means test.

The social worker's observations regarding her case-load are of interest; (1) There was a discouragingly long waiting list for facilities under the Quebec Hospitalization Insurance; (2) Problems associated with long-term illness predominated among patients from the Neurology service while from Neurosurgery the needs were chiefly for rehabilitation, employment, and convalescent care; (3) Returning patients to their own homes is less difficult when disability follows an accident or acute illness than when it is the result of chronic illness, such as multiple sclerosis; (4) While helping with concrete plans, the social worker is confronted with the emotional impact of the planning to patients and families, whose strengths and weaknesses play an important role in determining the kind and amount of assistance required from the social worker and from the community.

On the program for seizure patients, service to individuals and families has been given as in the past; the discussion group of French-speaking seizure patients has continued to meet on Wednesday evenings led by staff

social workers and, for several months, by a volunteer to whom we are most grateful. We also appreciate the advice about future plans from a skilled social group-worker recently affiliated with the Y.W.C.A. This year a third phase of the seizure program has been emerging. The design of the social information section for a survey of seizure patients is now completed. We hope for statistical information to help interpret the needs of these patients to the community and for data about the nature of the seizure population which could facilitate future research in this area. We have received valuable help from a Research Advisor from the McGill School of Social Work and from Dr. McNaughton and staff with whom we are undertaking the study.

We are always impressed by individuals and groups whose donations of time and funds have helped to ease the burdens of so many patients. Last year R.V.H. Volunteers donated over 580 hours to the Neurology and Neurosurgery clinics and to Social Service, and a variety of groups from the hospital setting and from the community generously contributed over \$5,000. Some donations were ear-marked for specific items, others simply "for the benefit of patients". With these funds, it was possible to help indigent patients with transportation to and from clinics, with outstanding hospital bills incurred before the advent of Quebec Hospital Insurance and with other services and supplies such as homemaker service, medication, wheelchairs.

To all who have contributed in any way, I wish to say "thank you": to the R.V.H. Womens' Auxiliary and Volunteers, to the M.N.I. Wives' Club and Graduate Nurses' Society, to those who have made memorial donations and to special interest groups such as the Cancer Aid League and multiple sclerosis societies; to the large group of health and welfare agencies in Montreal and beyond, with whom we work so closely; to the Social Service staff during a year of changes; and, of course, to doctors, nurses and other M.N.I. staff. We look forward to another year of collaboration in the interests of patients.

## DEPARTMENT OF ANAESTHESIA

DR. R.G.B. GILBERT

The Ventilator Technique continues to be of great interest; 274 cases were monitored to blood gas studies in the Department's Laboratory and by the use of the Wright Ventilometer.

The problem of tracheotomy gave rise to several difficulties during the year. 'Special' nurses, not acquainted with this type of care are a liability, even though they do their best. Nurses on the postgraduate course were given two series of lectures on anaesthesia, hypothermia, artificial ventilation, care of the unconscious and tracheotomy patient. The staff also offered instruction on ventilator care to classes of Fellows in the Institute. The refresher course in anaesthesia was given again. Lectures were given to the Diploma Course in anaesthesia and the operating room staff. The McGill Diploma Course in anaesthesia has continued as in previous years, the Fellows rotating through the Institute.

All anaesthetics given in the Institute are administered by or under the supervision of a staff anaesthetist.

Urea was more widely used than in the past. We have almost abandoned using Methoxyfluorane, instead turning to Fluothane which was employed in 825 cases.

Some new equipment has been made available through the Department of Health of the Province of Quebec.

Research was conducted on catecholamines under different conditions; electrolyte levels of neurosurgical patients on hydrocortisone; and the response to trauma in adrenalectomised rats on cortisone therapy.

There have been several changes in staff. Dr. R.A. Millar left to join the staff of the Department of Anaesthesia at Cambridge University. Dr. Craythorne left to become Assistant Professor and Chairman of the Department of Anaesthesiology at the University of West Virginia.

## DEPARTMENT OF RADIOLOGY 1961

DR. D. L. McRAE

In 1961 we had our busiest year, 9537 radiological examinations being carried out. In addition, 239 brain scans were accomplished, most of them done by one of the x-ray technicians. The demand was greater than we could cope with, some patients having to be sent elsewhere, mainly to the Royal Victoria Department of Radiology.

During the year, we performed 587 pneumoencephalograms, 131 ventriculograms, 12 stereotaxic procedures, 382 myelograms, 489 cerebral angiograms and 18 arterial catheterizations and aortograms. These complex examinations, totalling 1619, take from one to six hours to carry out. Although they represent 17% of the total number of examinations, they take almost half of our time.

It was eight years ago that the McConnell Wing was completed. The new x-ray department in that wing had been planned in such a way as to handle expected increases in volume of work and also to take care of future advances in radiology. The plan worked well for some seven years. We were able to keep up with the annual increase in volume of work until about 1959 but since then we have been forced to turn patients away. We were able to accommodate new, bulky, complex pieces of equipment but unable to increase our equipment because of lack of rooms. An unexpected demand for neuroradiological training has forced us to take two and sometimes three doctors for such training. These men have had no space to call their own and could only float about the department. We have great need for one more radiographic room as well as one room where the radiologists in training can be assigned desk or bench space for working and reading.

The comparative figures are revealing. In 1953, we carried out 7410 examinations and in 1961, 9537, a 29% increase in the number of examinations per year. In 1953, we carried out 1230 complex, time-consuming examinations such as encephalograms, arteriograms and myelograms. In 1961, we did 1619 such examinations, an increase of 30%. In 1953, we had one radiologist and one resident in training. Now we have two radiologists and three residents in training. In 1953, we had four technicians and now we have six. In 1953, we had two secretaries and now we have two full time and one part time.

In the summer of 1961, an automatic film processing unit, Kodak X-Omat, was installed. This unit completely processes an x-ray film in seven minutes. It allows immediate viewing of the completed film, dry instead of wet, and is particularly useful in the case of examinations on patients that are followed immediately by operation.

During 1961, four doctors studying neuroradiology, Drs. Beaulieu, Keogh and Vezina from McGill, and Dr. Fauteux from the University of Montreal, spent periods of six months each in the department. Dr. Guido Castorina of Rome completed his James Picker Foundation Fellowship in radiology in July 1961.

The postgraduate seminars in neuroradiology were given in the fall and the Monday morning colloquia were given from September to June as usual. It was a pleasure to share them with Dr. Romeo Ethier, Assistant Radiologist. The introductory course in general radiology for the second year McGill medical students was again given by us.

The nature of our work requires close cooperation with the interne and nursing staffs. As usual, it was cheerfully given and it is a pleasure to acknowledge it here.

## DEPARTMENT OF NEUROCHEMISTRY

DR. K. A. C. ELLIOT

### CLINICAL NEUROCHEMISTRY AND WARD LABORATORIES

The amount of work in the 7th floor clinical neurochemistry laboratory was somewhat greater than last year while that in the 3rd floor ward laboratory increased in volume very considerably.

Around 8,300 separate procedures were performed in the 7th floor laboratory on blood and spinal fluid samples obtained from patients. In addition 5,600 liters of irrigation solutions were prepared for the operating rooms and over 200 liters of nupercaine solution for the clinical services.

The ward laboratory performed about 16,000 separate determinations on blood samples, and drew another 3,600 for analysis in other hospital departments. The figures last year were 13,700 and 2,400 respectively. In addition some 5,000 urinalyses were done. The additional work of the 3rd floor ward laboratory was almost entirely due to an increased number of requests per patient.

The Neurochemistry and Ward Laboratories are administered by Dr. I. H. Heller and technical supervision is provided by Dr. Hanna M. Pappius.

## DONNER LABORATORY OF EXPERIMENTAL NEUROCHEMISTRY

Research activity and interest in Neurochemistry, the biochemical approach to the physiology and pathology of brain and nerve, is increasing rapidly throughout the world. Such increasing interest is apparent here at the Montreal Neurological Institute and, appropriately, the intensity and diversity of the activities of this research department have markedly increased.

Dr. Leonhard Wolfe and Dr. "Sandy" Lowden with their assistant, Miss Anna Morawska have extracted gangliosides from rat, ox, cat, and human cerebral cortex. The composition of the gangliosides from these different mammals was found to be similar. Purification and analysis of the components have made it clear that the ganglioside fraction of brain contains a number of types of glycolipid which differ in their content of N-acetylneuraminic acid (NANA), hexose and hexosamine. It has been possible to separate some of these types by using column chromatography on cellulose and silicic acid and by thin layer chromatography on silica gel. NANA has been shown to be combined in gangliosides in three different ways. The acidic properties of gangliosides have been examined and they have been shown to have a pK of 5.0, entirely due to the NANA carboxyl group.

In the course of isolation of gangliosides from human cortex it was noted that their NANA content varied in certain pathological conditions. A common feature in the history of patients from which gangliosides of low NANA content were isolated was a prolonged period of local or generalized hypoxia prior to death. Experiments carried out in the Neurophysiological Department in association with Dr. D. Pollen using cats have demonstrated that hypoxia of a degree sufficient to produce irreversible loss of electrical activity in the cerebral cortex of an anaesthetized cat caused a significant fall in the NANA content of the gangliosides.

Dr. Irving Heller and his assistant, Mr. Sigurd Hesse, have continued their studies on nerve metabolism. They have found that their "activating substance", which readily diffuses out of nerve but is necessary for the metabolic responses of nerves to insulin or electrical pulses, is thiamine or a derivative of thiamine. Evidence suggests that *in vitro* insulin and electrical pulses cause entry of thiamine from the surrounding fluid into the nerve. Their work also places further emphasis on the role of Schwann cells in nerve metabolism.

Dr. Hanna Pappius, in her studies on brain swelling and fluid spaces in brain tissue *in vitro*, has made ingenious use of proteins labelled with fluorescent dyes, which she has shown will occupy the same "spaces" in the tissue as will inulin. With essential help from Dr. Igor Klatzo of the National Institute of Neurological Diseases and Blindness, Bethesda, U.S.A., Dr. Pappius has shown that the major swelling which brain tissue — at



least brain slices *in vitro* — undergoes so readily is largely in a damaged region though some occurs intracellularly. These and other observations are in agreement with the conclusion of electronmicroscopists that normal brain contains little true extracellular fluid but it appears likely that the electronmicroscopists have not directed their observations in the right areas to observe a major type of *in vitro* swelling. In collaboration with Dr. R. Gulati, Dr. Pappius has studied the development of brain edema *in vivo*. Highly localized lesions in the cerebral cortex produced, within 24 hours, edema detectable by two chemical methods, in the subjacent white matter while none developed in the grey matter immediately surrounding the lesion.

Mr. Fernand Bilodeau has continued his studies on the effect of potassium, particularly low concentrations as in cerebrospinal fluid, on potassium-depleted brain. His studies indicate that the effect on metabolism is to be ascribed to the potassium actively absorbed into the tissue and not to that in the surrounding fluid. The effect is specifically on the utilization of glucose and is more sensitive to narcotic agents than any other metabolic system tested; effective concentrations are quite as low as those in tissue fluids which cause pharmacological actions *in vivo*. Mr. Bilodeau's finding that all the amino acids in brain occur, like GABA, partly in an occult form has been further confirmed.

Mr. Richard Lovell, S.J., using three entirely different chemical methods and the Factor I assay, has proved that all the Factor I in various regions of the brain can be accounted for by  $\gamma$ -aminobutyric acid (GABA) and, in spite of various claims by others, no other active substance can be extracted from brain in appreciable quantity. He has confirmed, by chemical methods, the estimates of others of the activity in various brain regions but has shown that such estimates are liable not to reflect the true GABA content of the tissue. This is because the GABA content increases markedly during the time commonly taken in dissection and, of more interest, the GABA content increases extremely rapidly during the first two minutes after death. This finding, obtained by use of liquid air freezing, shows extraordinarily active metabolism of GABA.

The new edition of the book NEUROCHEMISTRY is now in page proof. It will cover a great deal more material than the first edition and should be of interest to all neurological scientists as well as to those working in the broad field covered by the book. Dr. Wolfe has contributed a new chapter on nervous tissue to a new edition of a very standard work "PRACTICAL PHYSIOLOGICAL CHEMISTRY" (Hawk, Oser and Summerson). Mr. Bilodeau has submitted a thesis for the Ph.D. degree in Biochemistry. He has been awarded a Medical Research Council Post-doctoral Fellowship and will shortly leave to work at the Neuropsychiatric Research Center, Carshalton, England. Dr. Irving Heller has also made time among his multifarious activities to submit a thesis for the Ph.D. degree in experimental Neurology. The increase in tempo and diversity of the work in these laboratories is largely due to the fact that Dr. Wolfe has gotten well under way. It is therefore with great satisfaction that we note that Dr. Wolfe has been appointed to a Medical Research Associateship

by the Medical Research Council. This will allow Dr. Wolfe to continue his own work here under excellent circumstances, and many others in the neurochemical laboratories and the whole Institute may continue indefinitely to enjoy his advice, help and enthusiasm.

## DEPARTMENT OF ELECTROENCEPHALOGRAPHY

DR. PIERRE GLOOR  
DR. HERBERT JASPER  
DR. DONALD LLOYD-SMITH

During the past year a total of 3,436 EEG examinations were carried out in the laboratory. This represents an increase of 234 examinations or 7.3% over the figure for the preceding year. Out of this total of 3,436 examinations, 1,769 were carried out on patients hospitalized at the Montreal Neurological Institute, 459 on patients cared for at the Royal Victoria Hospital, and 1,208 on patients referred from the out-patient department, private offices or from other hospitals. A comparison with last year's figures reveals that no major changes have been brought about in the number of referrals by the introduction of the Quebec Hospital Insurance Plan. Notably the increase in the number of requested in-patient examinations which we anticipated with some apprehension, has failed to materialize. In fact the in-patient to out-patient ratio has shown no significant change since last year. We are very pleased that this important transition has come about so smoothly.

As for the preceding years, the break-down according to diagnostic categories shows that epileptics with a proven or merely suspected diagnosis of a convulsive disorder still represent the largest group of patients on whom an EEG examination was requested. This group numbered 1,379 patients and represents about 40% of the total patient population examined in our department. Many of these patients are subjected to increasingly prolonged and searching examinations as the value of such special, but time-consuming procedures as sphenoidal needle recordings and the intracarotid sodium amytal test, become more and more apparent.

Out of the 1,379 epileptic patients investigated, 74 were treated surgically and had an electrocorticogram taken during the neurosurgical procedure in the operating room. This represents only a small increase in comparison to last year's figure.

The exploration of new diagnostic procedures is a never-ending task we endeavour to pursue. With the help of Drs. I. Libman and F. Poirier the diagnostic merits of using the inhalation of nitrogen or of carbon dioxide to induce alterations of the EEG pattern has been investigated. In the developmental stage still are new recording techniques using averaging procedures of evoked potentials which are being developed in the Department of Electronics by Mr. K. Reid, Mr. E. Puodziunas and Mr. Lootus. This method is full of promise and once fully developed should add a very

important new method to our diagnostic arsenal. It will make it possible to apply more precise neurophysiological techniques to the diagnostic clarification of problems facing us in clinical EEG practise.

The teaching of Fellows and technicians has been expanded during the last year through the introduction of a weekly seminar in electroencephalography. Both the Canadian Society of Electroencephalographers and the Canadian Association of EEG Technicians have stressed the necessity of setting up training facilities in the leading laboratories of our country that would provide for formal training sessions in addition to the time-honoured apprenticeship type of on-the-job instruction. In the past year the main emphasis in these weekly seminars has been on fundamentals in neuro-anatomy, neurophysiology and neuropathology for EEG technicians, a course very ably given by Dr. O. Kalabay, and on basic electronics in its application to electroencephalography, a lecture and demonstration series given for the benefit of both Fellows and technicians.

During the past year the following Fellows have spent part of their training period in our laboratory: Dr. B. Brown, Dr. P. Drouin, Dr. M. Felt, Dr. R. Giguère, Dr. D. R. Gulati, Dr. O. Kalabay, Dr. I. Libman, Dr. Y. Renda and Dr. C. Stefanis (electromyography).

Investigative work, partly still in progress, covered the following subjects:

- (1) Long-term EEG follow-up studies on children afflicted with T.B. meningitis and cured after streptomycin therapy (Drs. P. Gloor and P. Drouin, in conjunction with Dr. G. H. Nickerson, Dept. of Paediatrics, R.V.H.);
- (2) A study on the correlation of occipital slow waves with certain psychological test patterns in school age children (Drs. P. Gloor and L. Taylor);
- (3) Studies on the response to intermittent photic stimulation in alcoholic withdrawal states (Drs. D. Lloyd-Smith, P. Gloor and R. Giguère).

The electromyography laboratory has also been very active in the past year. It handled 188 examinations which represents an increase of 19 examinations, or about 10% over last year's figure. Many of these examinations included conduction velocity measurements on peripheral nerves, an investigation whose clinical usefulness becomes increasingly more evident. Dr. C. Stefanis has ably carried this considerable load in addition to his exacting investigations in the neurophysiology laboratory. We are pleased to announce that Dr. Peter Thomas, who recently arrived from London, England, has been appointed electromyographer at the Institute. We are looking forward with eagerness to collaborate with him in this field.

This report would be incomplete without a word of thanks to our technicians who, under the expert guidance of Mr. Lewis Henderson, have done a first rate job in running our laboratory smoothly and dependably.

## DEPARTMENT OF NEUROPHYSIOLOGY

DR. HERBERT JASPER

DR. PIERRE GLOOR

Work in the laboratories of neurophysiology has moved at a slightly slower pace than in previous years owing to the fact that Dr. H. Jasper was absent overseas for a large part of the past year, devoting his energy and skill to the difficult task of transforming the International Brain Research Organization (IBRO) from a dream into a working reality. We were all pleased to hear that he has made great strides in this direction and that IBRO is well under way to become a most important and much needed catalyst in the field of neurological sciences.

The projects under investigation during the past year largely grew out of previous work done in this laboratory. Studies on the mechanism of epilepsy and on the function of the limbic system have accounted for much of the work pursued.

Drs. F. Redding from Pennsylvania and J. Siegfried from Switzerland have investigated the influence of hippocampal stimulation upon visual evoked potentials, a study which should be basic in helping to understand the more complex mechanisms whereby the hippocampus intervenes in the mechanisms of learning and memory. Since the departure of Dr. J. Siegfried to Boston, Dr. L. Marco from Spain has collaborated on this project with Dr. F. Redding.

As in the past some of the investigative work has been devoted to the problem of the mechanism of epileptic discharge. Drs. P. Perot, D. Pollen, and Mr. K. Reid have continued to investigate the intimate mechanism of the 3 per sec. spike and wave discharge characterizing petit mal epilepsy, bringing refined microelectrode techniques to bear upon this problem.

Dr. B. Blum from Israel, has been winding up his studies on focal epileptogenic lesions in cats and on some aspects of the pharmacological effect of Dilantin upon synaptic mechanisms in the motor cortex.

Elegant, intra-cellular microelectrode work on the motor cortex has been carried out by Dr. M. Matsunaga from Japan, and Dr. C. Stefanis from Greece. Many interesting results concerning the mechanism of inhibition and the possible significance of intra-cellularly recorded slow potentials were obtained.

Dr. D. Gulati from India in collaboration with Drs. Rasmussen and Pappius, continued his studies on cerebral oedema and the effect of cortisone upon the electrolyte and EEG changes associated with this condition.

Mr. R. Caruthers, a Ph.D. candidate in experimental psychology from the University of California in collaboration with Drs. H. and K. Müller from the Allan Memorial Institute, have, under the direction of Dr. P. Gloor, carried out a study concerned with the interaction of potentials in the amygdala evoked by cortical and hypothalamic stimulation. This was

a pilot study designed to elucidate some of the complex cortico-subcortical interactions that are mediated by the limbic system and may have some bearing on learning mechanisms and some aspects of temporal lobe seizures.

As in the past, the work in the neurophysiology department has received active support from the department of neuroelectronics under the direction of Mr. Nicholas Rumin. We are all sorry that Mr. Robert Nagler, our long-time senior electronic technician, has recently left us. His work has been ably carried on by Mr. E. Puodziunas and Mr. G. Lootus who recently joined our department of neuroelectronics. Last, but not least, we wish to thank Miss Mary Roach for taking care of the innumerable tasks involved in keeping the running of an active neurophysiology laboratory like ours on an even keel.

## DEPARTMENT OF NEUROPATHOLOGY

DR. GORDON MATHIESON

DR. GILLES BERTRAND

During the year January to December 1961, a total of 472 surgical specimens were studied in the department, this work being shared by Drs. Bartolo Barone and Manoucher Gueramy in successive six-month spells. During this same period, autopsy was carried out on 96 of the 116 patients dying in the Institute, an autopsy rate of 82.7%. We are indebted to the Medico-legal Department of the Province of Quebec for permission to study 32 of these cases at the City Morgue. In addition, the brains of 389 patients dying in the Royal Victoria Hospital were examined in collaboration with the Department of Pathology. An additional 132 brains of patients dying in other hospitals (including the Verdun Protestant Hospital, the Jewish Hospital of Hope, the Royal Edward Laurentian and Grace Dart Hospitals) were studied, again in collaboration with the Department of Pathology. Some 22 cases were referred from elsewhere and in most of these cases detailed studies were made, usually of the brain. This work, which was often presented and discussed at our weekly clinico-pathological conference, was carried out by a considerable number of Fellows comprising Drs. Barone, Bhathal, Carpenter, Dayes, Embree, Gueramy, Heuff, Polizos, Solis and Spence.

We welcomed to the department in the Fall of 1961 Dr. Andrzej Gluszczyk from the Department of Pathology of the Medical School, Lodz, Poland, who is spending a year with us as Rockefeller Fellow. Dr. Gluszczyk, whose main interest is in tumour pathology, is investigating the enzyme activity of cerebral tumours and their blood vessels. The acquisition of a cryostat and related equipment has extended the range of our technical facilities in this direction. Another step in the extension of our technical range has taken place more recently in the form of a joint project on electron microscopy of the cerebellar cortex, being carried out by Dr. Robert Herndon in association with Dr. Sheldon, electron microscopist on the staff of the Pathological Institute. Some results of histochemical and

biochemical studies of the lipodosis, in which we were fortunate enough to have the collaboration of Professor J. N. Cumings of Queen Square, were presented at the International Congress of Neuropathology held in Munich in September 1961 by Dr. Mathieson, who later visited some of the neurological clinics and laboratories in Poland. Dr. Mathieson has also been appointed a corresponding member of the Commission of Neuropathology of the World Federation of Neurology.

Dr. Manoucher Gueramy has been investigating the experimental production of chronic subdural haematoma in cats, under the guidance of Dr. Gilles Bertrand. Dr. Barone has continued his work on the cytology of abnormal cellular elements in the cerebrospinal fluid using the acridine orange technique.

Drs. Bertrand and Polizos have been studying the morbid anatomy of diastematomyelia. Dr. Matthew Spence has been continuing the departmental interest in lipidoses with an increasing trend towards their biochemical aspect, which may well take him outside the confines of this department. Dr. Lloyd Dayes has been collaborating with Dr. Hanna Pappius and Dr. Dosseter in experiments on cerebral oedema, long a subject of interest in the Institute. The equipping of a small laboratory for tissue culture is now virtually complete and the work is starting.

As will be apparent from the brief outline given above, the work and interests of this department are ramifying in several quite diverse directions, and it behooves us to consider very carefully how best they may be fostered in order to produce solid and reliable work. The danger of superficial and uncritical studies in matters of topical interest is always with us. Probably the best guard against this is the development in the department of a stable nucleus of workers who can contribute their skills in one or two of the more advanced techniques, as well as helping with the service load and teaching, both undergraduate and graduate. Indeed it is doubtful whether a modern department of neuropathology can be run without the continued availability of such skills. Unfortunately, we cannot as yet report that this happy state of affairs exists in the department. However we look forward to its gradual development in collaboration with the other departments of the Institute over the coming years.

## MULTIPLE SCLEROSIS LABORATORY

DR. J. B. R. COSGROVE

During this academic year studies have continued on an abnormal gamma globulin found in the cerebral spinal fluid but not in the sera of patients with Multiple Sclerosis. A series of immunoelectrophoretic analyses on individual specimens from patients with various neurological diseases is underway to determine the specificity of this finding. These studies include a correlated investigation of the clinical status of multiple sclerosis patients and the immunoelectrophoretic analyses of individual CSF specimens to ascertain at what stage in the illness and to what extent these abnormal proteins may be formed in Multiple Sclerosis.

Doctor MacPherson has been successful in the development of a chromatographic method to purify the gamma globulin which seems specific to CSF and now named gamma c globulin. A sufficient quantity of purified gamma c globulin has been prepared to make use of a quantitative immunochemical method to measure amounts of this globulin in a few milliliters of CSF. It should now be possible to obtain precise knowledge of the quantitative variations in the gamma c globulin in health and in diverse neurological illnesses. In addition, Doctor MacPherson has also made a start on an immunochemical survey of the proteins of normal brain and spinal cord. It is hoped that the basic knowledge derived from these studies will help clarify the findings of the abnormal proteins of the CSF in Multiple Sclerosis and throw light on the biological significance of the gamma c globulin.

This year we have welcomed the close association of Dr. Allan Sherwin who has recently been honoured by a Markle Foundation Fellowship. In collaboration with him and the Department of Immunochemistry and Allergy Research of the Royal Victoria Hospital a group of three projects have been completed in the past year. The first of these studies concerned the specificity of antibody gamma globulin deposited in tissues damaged by hypersensitivity reactions. The second investigation involved myelin-binding antibodies. It has been possible to demonstrate that the serum, and in some cases, the CSF of animals suffering from experimental allergic encephalitis contain antibodies which appear to be specifically directed against myelin. A third investigation has been carried out on the blood-CSF barrier to certain proteins. It has been possible to determine the relative distribution of antibody across the blood-CSF barrier and to show that gamma globulin enters the CSF slowly from the blood reaching equilibrium between 12 and 24 hours after intravenous administration.

Clinical investigations have been mainly concerned with the study of the effect of long term administration of intrathecal injections of depomedrol on the electrophoretic protein pattern of the CSF and the clinical status of patients with Multiple Sclerosis. In addition, a study of the clinical usefulness of the injection of phenol solutions intrathecally for

the treatment of spasticity and intractable pain has been initiated. The long-term follow-up study of Multiple Sclerosis patients continues in the Multiple Sclerosis Clinic of the Royal Victoria Hospital. The laboratory continues to supply gamma globulin determinations in the CSF for the clinical services and last year performed 675 separate determinations.

## DEPARTMENT OF NEUROANATOMY

DR. F. L. McNAUGHTON

The Undergraduate Course on the nervous system has again been an important responsibility of members of this department, in collaboration with other university departments.

This course, serving as a broad introduction to the structure and function of the nervous system, covers all three terms of the second year. The dissection of the brain is started in the fall term as part of Professor Langman's course on the head and neck, and carried on through the winter term in weekly laboratory periods supervised by Dr. John Blundell, Dr. Allan Morton, and a group of instructors drawn mainly from the Fellows in training at the M.N.I. Lectures are given in the winter and spring terms by Dr. J. Blundell, Dr. P. Gloor, Dr. B. Milner and other staff members, in collaboration with Professor Burns of the Department of Physiology at McGill and Professor Hebb of the Department of Psychology. Clinical demonstrations are given throughout the winter term, to teach the practical application of anatomy and physiology in the study of neurological disorders.

Dr. Mathieson's lectures and demonstrations in neuropathology, and student instruction in clinical examination of the nervous system, given in the spring term, fit in well with this course. It is planned as a preparation for the student's clinical experiences in neurology in the third and fourth years, and introduces him to some of the newer developments in experimental neurology.

Dr. Paul Yakovlev, Emeritus Professor of Neuropathology at Harvard University, delivered the Annual Neuroanatomical Lecture, and directed three teaching sessions in neuroanatomy, which were most stimulating.

At present, the Department of Neuroanatomy is understaffed. We hope to add a full-time research neuroanatomist to the Staff, in the near future.

## CONE LABORATORY FOR NEUROSURGICAL SERVICES

DR. WILLIAM FEINDEL

During the year 1961 the Automatic Contour Brain Scanner was put into full operation. Two hundred and thirty-nine brain scans were completed. The radioactive isotope used was radioactive iodinated human serum albumin in a dosage of 400 microcuries given intravenously. Previous to the injection of the radioisotope the thyroid gland was blocked by giving the patient Lugol's iodine solution by mouth.



The procedure has continued to be useful in detection and localization of neurological lesions and in providing supplementary information on the permeability and vascularity of brain tumors and other lesions.

During the year the services of a physicist were available as well as two neurosurgical Fellows.

A separate hospital budget was established for this laboratory. Scanning was carried out in the Department of Neuroradiology under the supervision of the radiological technicians. This proved highly satisfactory but the shortage of technicians has made it necessary to employ other personnel to carry out the brain scans during the current year.

The clinical work of the Isotope Laboratory could not have been carried on without the co-operation of Dr. McRae and his radiological technical staff and also the help of Dr. Carleton Peirce and Dr. Lloyd Stephens-Newsham of the Royal Victoria Hospital. The free exchange of ideas and help has enabled the Neuro-Isotope Laboratory to become established by 1961 as a useful and active clinical laboratory unit.

## THE TUMOUR REGISTRY

ARTHUR R. ELVIDGE, M.D.

During the year 1961 the records of 348 patients have been recorded by the Tumour Registry. One hundred and eighty-six of these were of verified tumour. In the course of treatment 256 required major surgery and 77 received Roentgen therapy with or without surgery. In addition patients made 257 visits to the Outdoor Clinics.

As repeatedly stated the purpose of the Registry is to catalogue and to record the follow-up of patients treated at the Montreal Neurological Institute for suspected and verified tumour involving the Nervous System. Follow-up data is obtained through the Outdoor Clinics, private offices, referring doctors and the Department of Demography, Ottawa. Clinic patients are advised to return for follow-up and treatment and are helped in social problems by the Social Service Department. This is valuable for both patient and doctor. The records serve as source material for research into tumour growth under various types of treatment.

During the year Miss Yvonne Leichti succeeded Miss Suzanne Cripps as tumour registry secretary. Dr. Henry Garretson succeeded Dr. Daniel Gonzales as Fellow.

During the year Dr. Emile Berger, former registry Fellow, completed his analysis of the medulloblastomas and sarcomas of the cerebellum. He gave a summary of this at The International Neuropathological Congress in Munich and at the International Neurosurgical Congress in Washington. He will speak on the Tumours Involving the Central Nervous System of Childhood at the Canadian Neurological Society in Winnipeg. Dr. Daniel Gonzales completed his analysis of the occurrence of epilepsy in the cerebral astrocytomas and this has been accepted for publication. Dr. Henry Garretson

is made a study of certain clinical syndromes involving the vagal system of the brain stem. He has also established a culture of human tumour cells for study of cell growth and metabolism. Dr. B. Barone has been interested in the long term follow-up of glioblastoma multiforme, and Dr. P. Tandon in the gliomas of the dominant hemisphere. The registry secretary has so aided researchers in several other projects.

## DEPARTMENT OF NEUROPHOTOGRAPHY

DR. GILLES BERTRAND

This past year has again been a very active one for the department. It is one that has seen great strides in the new section of chart illustrations. In one month alone there were over 100 illustrations set up. This new additional service has helped improve the quality of illustrations in the Institute and really makes this department now a medical illustration department.

The usual number of operations, patients, specimens and copy work were carried out during the year. There was a great deal of fluorescent photomicrography carried out. Although in the early part of experimenting in this field the expense was high, we were in the end able to increase the speed of colour film 4-5 times beyond that recommended by the manufacturers. This enabled one to take fluorescent photomicrographs that had previously been impossible. A paper was given on this method entitled "Increased Film Speed in Fluorescent Photomicrography" at the Annual Meeting of the Biological Photographic Association in Chicago.

We are pleased to say that a start was made this year in setting up the museum on the 6th floor. There have been many obstacles in the original construction of the panels but most of these have been overcome, and at present 14 panels have been completed with another 14 in the making. Each one of these panels requires approximately one week's work. Consequently progress will be slow as this work under the present circumstances can only be carried out in spare time.

A re-filing of all the 16 mm. films has been completed and a proper system installed to obtain any movie from our files. In the line of movies taken during the year we have seen many hundreds of film go through our cameras, but we are sorry to say that again this year we have not completed a teaching film. There is quite a difference between taking movies and the planning and making of a teaching film. We take many films of patients, etc., and they rest in our files and are seldom seen by the person who requisitioned the film. We hope that in the near future someone will come forth to assist in going through the present material and help direct future planning in this particular area of the department.

During the past year in the Institute there has been a trend towards 35 mm. slides rather than the  $3\frac{1}{4} \times 4$ , with some members having both sizes made of everything. This has been an additional expense as well as an overload of work in the department.

Mr. Jean Garneau, who has been Mr. Hodge's able assistant for the past two years, will be leaving to take a new post at the University of Montreal. In the near future some thought should be given to a permanent assistant in the department. The additional strain, not to mention the expense (approximately \$1,000.) of training a new assistant every two years is becoming too great with the present workload.

Mr. Hodge attended the Annual Meeting of the Biological Photographic Association in Chicago, and, for the second time, won the award for giving the best paper.

## THE FELLOWS' LIBRARY

DR. PIERRE GLOOR

During the past year the Fellows' Library has been permeated by a new atmosphere of quiet yet determined efficiency. This welcome change is to be credited to the devoted and competent work done by our Librarian, Mrs. A. Melzak. For many of us the efficient help a professional librarian can bring to our own investigative work has been a new and welcome experience. It is therefore a pleasure to report that Mrs. Melzak has recently been appointed as full-time Librarian. This enables her to devote more of her time than previously to the task of re-organizing our library collection, and to bring it to accepted library standards. The setting up of a register of library borrowers, of a master cardex file and of a shelf list, an indispensable tool for inventory purposes and a helpful gauge of the strength of our collection by subjects, are only a few of the many improvements initiated and carried out by our Librarian. Work is proceeding apace on drawing up a subject authority file and on gradually recataloguing the entire collection. Only when these tasks are completed can the Library become a properly functioning unit giving efficient service to our fellows and staff members.

The Fellows' Library now receives 107 journals of which 44 are subscriptions paid out of our own funds. The other 63 are obtained as gifts and exchanges. The Library has continued to receive 22 exchange subscriptions through the courtesy of the EEG Journal and we wish to express our gratitude to Dr. Herbert Jasper, who made it possible to continue this exchange for another year. Unfortunately, however, we received word that this very helpful arrangement is now going to be discontinued, which leaves us under the obligation to find the necessary funds to carry on the subscriptions to those periodicals now obtained by exchange, which are essential for our own needs.

The Library received 50 monographs during the year covered by this report. 21 of these were paid from our own funds and 29 were gifts, half of which were Russian monographs received by various members of our staff. Gifts were received from Doctors Penfield, McNaughton, Rasmussen, Jasper, Lloyd-Smith, Keith and Gloor, and are herewith gratefully acknowledged. These figures when put into the proper perspective show

that we purchase only a very small fraction of monographs published in the neurological field. It thus becomes all the more important to make the most judicious use of the limited funds at our disposal for these purchases.

To meet the increasing demands within the existing means at our disposal has become the paramount problem facing our Library. We feel that the Fellows' Library has entered a critical stage in its development and that a clear definition of our future goals and the means to achieve them, is an urgent requirement. For this reason the past year has been one of clearing stock and of attempting to chart our future course.

The appointment of a permanent Library Committee at this crucial stage is thus a most welcome development, for it creates the proper forum where difficult problems can be aired. This Committee has given much thought to the necessity of defining a clear, long-range policy which would take into account the need for growth and expansion of our Library. Sooner or later this need will have to be met if we do not want to be forced to break radically with our tradition and transform our Library into a reading room concentrating almost exclusively on recent issues of periodicals and a few basic texts. The consequences of such a reorientation are far-reaching and should be weighed very carefully before committing ourselves to such a radical change of course.

# THE MONTREAL NEUROLOGICAL SOCIETY

1961-62

<i>President</i> .....	DR. J. DESROCHERS
<i>Vice-President</i> .....	DR. G. MATHIESON
<i>Secretary-Treasurer</i> .....	DR. I. HELLER

Twenty-two meetings of the Section of Neurology of the Montreal Medico-Chirurgical Society were held from September 27th, 1961 to April 18th, 1962.

Clinical meetings were held at Notre Dame Hospital, Hotel Dieu, Ste. Justine Hospital, Maisonneuve Hospital, the Montreal Children's Hospital, and the Montreal General Hospital.

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

MR. NORMAN DOTT, Department of Surgical Neurology, Royal Infirmery,

MR. G. F. ROWBOTHAM, Department of Neurological Surgery, Newcastle General Hospital, England: "Unconsciousness Following Head Injuries".

DR. GAVIN GLASGOW, University of Dunedin, New Zealand: "Subacute Inclusion Body Encephalitis".

Edinburgh: "Cerebro-Spinal Fluid Circulation in Relation to Surgical Neurology".

DR. R. HASSLER, University of Freiburg, Germany: "Mechanism of Involuntary Movement".

DR. BIRGER KAADA, University of Oslo, Norway: "Effects of Hippocampal Lesions on Maze Learning and Retention".

DR. PHILIP R. DODGE, Pediatric Neurological Service, Massachusetts General Hospital, Boston: "The Neurological Manifestations of Disturbances in Water and Electrolyte Metabolisms".

DR. JOHN STIRLING MEYER, Professor and Chairman, Department of Neurology, Wayne State University, Detroit: "Studies of Oxidative Metabolism of the Living Brain — Relation to EEG, Sodium and Potassium".

PROFESSOR Z. SERVIT, Director, Institute of Physiology, Czechoslovakia Academy of Sciences, Prague: "Reflex Mechanisms in the Pathogenesis of Audio-Genetic Seizures in the Rat".

2. MAYNARD COHEN, Professor of Neurology, University of Minnesota, Minneapolis: "Relationships between Glucose and Glutamate Metabolism in Brain".
3. SAMUEL P. BESSMAN, Professor of Pediatric Research and Associate Professor of Biochemistry, University of Maryland, Baltimore: "Ammonia Metabolism and a Possible Mechanism of Hepatic Coma".
4. J. DAVID ROBERTSON, Assistant Professor of Neuropathology, Harvard Medical School and Associate Biophysicist, McLean Hospital, Boston: "The Ultrastructure of Unit Membranes and their Contact Relationships in Synapses".
5. PAUL YAKOVLEV, Department of Neurology, Harvard Medical School, Boston: "The Limbic System and the Hippocampus. Anatomical and Developmental Aspects, and Some Clinical Applications".
6. P. K. THOMAS, Department of Neurology, Montreal General Hospital: "Clinical Application of Nerve Conduction Studies".
7. D. K. C. MACDONALD, Division of Pure Physics, National Research Council, Ottawa: "'The moving finger writes . . .' (The Irreversibility of Time)".
8. E. P. RICHARDSON, JR., Massachusetts General Hospital, Boston: "Some Thoughts on the Problem of Diffuse Cerebral Sclerosis".
9. R. W. GILLIATT, The National Hospital, Queen Square, London: "Some Recent Studies of Human Peripheral Nerve Function".

## THE FELLOWS' SOCIETY

DR. GARTH EMBREE, *President 1962*  
DR. FALAH MAROUN, *President 1961*  
DR. ROSARIO MUSELLA, *Vice-President*  
DR. JEAN ST. HILAIRE, *Secretary*

This year, like those previously, has been a successful one for the Fellows' Society of the MNI, characterized by a multiplicity of events which have in part added to the life of each Fellow of the Institute.

Again the Fellows were honoured on many occasions by lecturers who have come from local and distant parts of the world. Doctors Paul Yakovlev, Philip Dodge, John S. Meyer, Jacob Chandy, Birger Kaada, Derek Denny-Brown, and Norman Dott are but a few of the distinguished visitors to the MNI, and have contributed immensely towards the academic and social life of the Fellows' Society for this year.

These lectures and talks, coupled with both the privilege of attending the weekly meetings of the Montreal Neurological Society and the regular teaching program within the Institute itself, have certainly contributed greatly to the foundation of each and every fellow in his or her pursuit to understand the nervous system in as many ways as possible. For these we would like to extend our full appreciation and gratitude.

The regular Christmas party was a great success. In conjunction with the MNI Post-graduate Nurses' Society, the Annual Skating Party was held in February 1961, where an enjoyable time was had by all. The Annual Picnic was held early in July 1961, which also proved most successful.

### 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.

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

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

\*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.

Senior 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 twelve 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.

## COURSES OF INSTRUCTION

### UNDERGRADUATE

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

### GRADUATE

In the Faculty of Graduate Studies and Research, courses are offered leading to the degree 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.

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

1. This course is given in combination with course Med. 2A "The Central Nervous System".
2. Additional graduate seminars will be held co-ordinated with Course B.
3. Graduate students are expected to pass the same examination which is given in undergraduate course Med. 2A, but with higher standing, and to act as demonstrators.

Professor McNaughton

4. Advanced Neuroanatomy for selected group; times to be arranged.  
Professor McNaughton



B. SEMINAR IN NEUROPHYSIOLOGY.

1. Lectures and examination together with undergraduate course Med. 2A "The Central Nervous System".
2. Weekly seminars and demonstrations co-ordinated with Course A-2 (4 months, beginning in December). Mondays, 4:30 to 6:00 p.m.
3. Under exceptional circumstances, a paper on a neurophysiological subject may be written by special arrangements as a substitute for B-1.

Professors Jasper, Elliott, and Gloor

C. COLLOQUIUM IN CLINICAL NEUROLOGY.

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

Staff and Visiting Lecturers

D. SEIZURE MECHANISMS AND CEREBRAL LOCALIZATION: Clinical Electroencephalographic, and Roentgenographic Conference.

M.N.I. 1½ hours weekly (9 months). Tuesdays, 4:00 to 5:30 p.m.  
Professors Rasmussen, Jasper, McNaughton, and McRae

E. OUTLINE OF NEUROCHEMISTRY.

Instruction in neurochemistry in addition to that provided in course B-2 may be obtained by special arrangement.

Professor Elliott

F. NEUROPATHOLOGY.

1. Six months laboratory in neuropathology.  
Professors Mathieson and Bertrand
2. Conference in neuropathology, Thursdays, 4:00 to 5:00 p.m.  
Professors Mathieson and Bertrand
3. Introduction to histopathology of the Nervous System. A short basic course for a limited number. By special arrangement with Professor Mathieson.

For graduate credit, courses Nos. 1 and 2 are required. Under special circumstances written and/or oral examinations may be substituted for Nos. 1 and 2.

G. NEUROLOGICAL RADIOLOGY.

1. Lecture demonstrations (3 months beginning in September). Mondays, 4:30 to 6:00 p.m.
2. Colloquium, 1 hour weekly (9 months) Mondays, 9:00 a.m.  
Professor McRae

## PUBLICATIONS

1961-62

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*Interpretation of the Electroencephalogram in Epilepsy.* *Triangle; the Sandoz Journal of Medical Science*, v. 5, p. 28-36, 1961.  
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## *ENDOWMENTS*

- 1934 — Rockefeller Foundation Endowment
- 1951 — Donner Canadian Foundation Grant
- 1954 — Lily Griffith McConnell Endowment
- 1957 — Hobart Anderson Springle Memorial Endowment
- 1958 — Rupert Bruce Memorial Endowment
- 1959 — Percy R. Walters Memorial Endowment
- 1960 — William Cone Memorial Endowment

## *FELLOWSHIP FUNDS*

- 1948 — Duggan Fellowship
- 1950 — Lewis L. Reford Fellowship
- 1956 — Dr. and Mrs. Charles F. Martin Fellowship

## *RECURRING ANNUAL GRANTS*

- 1947 — Federal Government Consolidated Grant

## *GRANTS FOR SPECIAL PROJECTS*

- Dominion-Provincial Health Grant — Dr. McNaughton
- “ “ “ “ — Dr. Rasmussen
- Elizabeth Kenny Foundation Fellowship Grant — Dr. L. Wolfe
- U.S. Public Health Neurological Training Grant — Dr. McNaughton
- U.S. National Science Foundation Grant — Dr. Jasper
- U.S. Public Health Grant — Dr. Milner
- Donner Canadian Foundation Grant — Dr. Elliott

## DONATIONS TO SPECIAL FUNDS — 1961-62

ANAESTHESIA RESEARCH FUND :	
LARENCE BERNSTEIN MEMORIAL RESEARCH FUND :	
RAIN TUMOUR RESEARCH FUND :	
ORDEN FELLOWSHIP FUND :	
ANCER CLINICAL RELIEF FUND :	
WILLIAM CONE MEMORIAL RESEARCH FUND :	
<i>Harold Crabtree Foundation</i> .....	\$ 1,000.00
<i>Mr. A. Douglas Crews</i> .....	200.00
<i>Mr. Victor M. Drury</i> .....	25.00
<i>Mr. Gordon Gowling</i> .....	200.00
<i>Mr. Danforth Holley (Earl-Beth Foundation)</i> .....	300.00
<i>Mrs. Peter Laing</i> .....	500.00
<i>Mr. John E. Langdon</i> .....	450.00
<i>Mr. André Marcil</i> .....	25.00
<i>M. N. I. Graduate Nurses Society</i> .....	50.00
<i>Mrs. Edna Roberts, in memory of Mr. E. Percy Roberts</i> .....	100.00
<i>Mrs. H. Y. Russel</i> .....	5.00
<i>Mr. Ewart Stavert</i> .....	1,000.00
<i>Mr. Benjamin Usheroff</i> .....	500.00
<i>Oaklawn Foundation, for fellowship</i> .....	1,000.00
OSGROVE RESEARCH FUND :	
<i>Mr. Clifford Hargrove</i> .....	80.00
<i>Mr. Gary Cross</i> .....	20.00
<i>Mr. Cliff Hurst</i> .....	10.00
TICK EPILEPSY FUND :	
ORDON LIBRARY FUND :	
LARVEY CUSHING CLINICAL RELIEF FUND :	
<i>In His Name Society</i> .....	27.00
<i>Mrs. Peter Laing</i> .....	500.00
<i>Mrs. Thelma Craft</i> .....	10.00
<i>Mr. J. Clare Wilcox</i> .....	100.00
<i>Mrs. F. Stott</i> .....	10.00
<i>Miss Suzanne Cohen</i> .....	30.00
<i>R. V. H. Women's Auxiliary</i> .....	2,000.00
<i>Mr. Maurice Gabes</i> .....	5.00
HOSPITAL EQUIPMENT FUND :	
<i>Miss Muriel Grimmer</i> .....	25.00
LARY MASSABKY FOUNDATION RESEARCH FUND .....	
	165.06
I. N. I. NEUROSURGICAL RESEARCH FUND :	
I. N. I. STAFF LOAN FUND :	
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<i>R. V. H. Women's Auxiliary for Social Service Fund</i> .....	150.00
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<i>In Memory of the late Mr. J. Donald Taylor</i> .....	98.00
MULTIPLE SCLEROSIS CLINICAL RELIEF FUND :	
<i>Multiple Sclerosis Golf League</i> .....	375.00
<i>Montreal Association for Multiple Sclerosis</i> .....	1,111.66
<i>Mr. S. Bell</i> .....	150.00
<i>Mrs. M. Nadler</i> .....	85.00

MULTIPLE SCLEROSIS RESEARCH FUNDS :	
<i>Anonymous</i> .....	20,000.00
<i>Multiple Sclerosis Society of Canada</i> .....	22,700.00
McDOUGALL NURSING SCHOLARSHIP :	
McNAUGHTON NEUROANATOMY RESEARCH FUND :	
<i>Anonymous</i> .....	100.00
<i>Mrs. R. W. Reford</i> .....	500.00
NEUROLOGICAL RESEARCH FUND :	
<i>Mrs. Charles E. Conner</i> .....	200.00
<i>Dr. Joseph Keith</i> .....	30.00
<i>Estate of the late Miss Nettie C. Lingle</i> .....	5,000.00
NEUROPHYSIOLOGY RESEARCH FUND :	
NEURORADIOLOGY RESEARCH AND TEACHING FUND :	
NURSING EDUCATION FUND :	
OAKLAWN FOUNDATION FELLOWSHIP FUND .....	2,000.00
PENFIELD RESEARCH FUND :	
LEWIS REFORD FELLOWS' FUND :	
EVELYN ROBINS MEMORIAL FUND FOR RESEARCH IN VASCULAR DISEASES :	
<i>Dr. George E. Robins</i> .....	1,000.00
WOMEN'S AUXILIARY FUND:	
<i>Graduate Nurses Society of the Montreal Neurological Institute</i> .....	100.00
<i>Women's Auxiliary of the Royal Victoria Hospital</i> .....	1,050.00

# STATISTICS

## CLASSIFICATION OF DISEASES

### *Nervous System Generally:*

Multiple Sclerosis .....	119
Motor Neurone Disease .....	25
Neurosyphilis .....	2

### *Meninges:*

Meningocele & Myelomeningocele .....	20
Acute Purulent Meningitis .....	7
Tuberculous Meningitis .....	5
Headache .....	74
Subdural Haematoma .....	30
Subdural Hygroma .....	3
Epidural Haematoma .....	12
Subarachnoid Haemorrhage .....	25
CSF Rhinorrhoea .....	1
Miscellaneous .....	1

### *Brain:*

Congenital Anomalies .....	13
Hydrocephalus .....	28
Abscess .....	5
Concussion .....	166
Contusion, Laceration, Traumatic Encephalopathy .....	130
Syncope .....	18
Ischemia .....	34
Epilepsy .....	418
Migraine .....	35
Parkinsonism .....	20
Vertigo .....	7
Thrombosis, Encephalopathy due to Arteriosclerosis .....	128
Haemorrhage .....	15
Intracranial Aneurysm .....	29
Encephalitis .....	13
Miscellaneous .....	6

### *Tumours:*

Gliomas .....	21
Perineurial Fibroblastoma .....	4
Meningeal Fibroblastoma .....	22
Craniopharyngioma .....	3
Angioma .....	11
Glioblastoma Multiforme .....	19
Metastatic Carcinoma — General .....	39
Meningioma .....	8
Astrocytoma .....	23
Medulloblastoma .....	4
Tumours — Unclassified .....	26
Chordoma .....	1
Oligodendroblastoma .....	2
Haemangioblastoma .....	6



Secondary Tumours, Brain, Spinal Cord .....	6
Sarcoma .....	4
Neurofibroma .....	10
Dermoid Cyst .....	4
Stenosis Aqueduct of Sylvius .....	3
Chromophobe Adenoma Pituitary .....	15
Granuloma, Eosinophilic .....	2
Sacral Radiculopathy due Metastases .....	9
Miscellaneous Tumours — Body generally .....	2
Miscellaneous CNS & Skull .....	1
Bronchogenic Carcinoma .....	6

### *Spinal Cord:*

Compression of the Spinal Cord .....	14
Transverse Acute Myelitis .....	1
Guillain-Barré Syndrome .....	2
Myelopathy .....	31
Syringomyelia .....	7
Radiculitis .....	4
Poliomyelitis .....	4
Miscellaneous .....	5

### *Cranial and Peripheral Nerves:*

Optic Neuritis .....	3
Trigeminal Neuralgia .....	41
Bell's Palsy .....	7
Menière's Syndrome .....	17
Traumatic Peripheral Nerve Lesions .....	2
Compression Ulnar Nerve .....	9
Other Neuralgias .....	19
Peripheral Neuropathy .....	25
Diabetic Neuropathy .....	3
Ocular Myopathy .....	3
Miscellaneous .....	5

### *Muscles:*

Myasthenia Gravis .....	8
Muscular Atrophy .....	16
Polymyositis .....	5
Miscellaneous .....	11

### *Mental Diseases:*

Mental Retardation .....	10
Depression .....	15
Anxiety State .....	22
Conversion Reaction .....	10
Psychoneurosis .....	2
Alzheimer's Disease .....	6
Schizophrenia .....	4
Miscellaneous .....	3

### *Other Systems:*

Protrusion Disc — Lumbar .....	216
— Cervical .....	50
— Thoracic .....	2
Fracture and/or Dislocation of Vertebral Column .....	39
Fracture Skull .....	62
Back Pain .....	15

Neck Pain .....	3
Face Pain .....	7
Traumatic Lesions and Infections — Misc. ....	19
No CNS Disease .....	5
Miscellaneous .....	30

## OPERATIONS

### *Craniotomy : (Osteoplastic, miscellaneous, etc.)*

and Removal of Contused Brain .....	4
and Biopsy .....	3
and Decompression .....	5
and Drainage of Abscess .....	2
and Drainage of Subdural Haematoma .....	13
and Drainage of Intracerebral Haematoma .....	7
and Drainage of Extradural Haematoma .....	9
and Excision of Epileptogenic Tissue .....	61
and Excision of Aneurysm .....	1
and Exploration .....	4
and Hypophysectomy .....	11
and Clipping of Aneurysm .....	6
and Obliteration of Cyst .....	1
and Removal of Tumour .....	99
and Rhizotomy .....	11
and Sinusotomy .....	1
and Removal of Bony Tumour .....	1
and Removal of Arteriovenous Malformation .....	2
Hemispherectomy .....	3

### *Trepanations & Craniocentesis*

and Biopsy .....	5
and Drainage of Subdural Space .....	12
and Placement of Electrodes .....	2
and Drainage of Abscess .....	1
and Ventricular Puncture .....	2
and Ventriculography .....	5
and Pallidotomy .....	6
and Exploration .....	9
Elevation of Depressed Skull Fracture .....	38
Plastic Repair of Skull Defect, Tantalum .....	1
Plastic Repair of Skull Defect, Bone .....	5
Suture of Lacerated Wound of Scalp .....	2
Ventriculocisternostomy (Torkildsen's) .....	4
Ventriculovenostomy & Ventriculo-atrial Shunt .....	15
Artificial Cranial Suture .....	3

### *Laminectomy or Hemilaminectomy*

and Anterolateral Cordotomy .....	13
and Biopsy .....	2
and Decompression of Spinal Cord .....	10
and Exploration .....	9
and Removal of Haematoma .....	2
and Removal of Tumour .....	18
and Rhizotomy .....	9
and Spinal Fusion, Hibbs' .....	1
and Spinal Fusion with Bone Graft .....	26
and Discectomy .....	123
and Cervical Discectomy .....	6
and Cutting of Dentate Ligament .....	3
and Removal of Malformation of Bone .....	1

## *Sympathectomy*

Plastic Repair of Cranium Bifidum .....	5
Plastic Repair of Spina Bifida .....	10
Ligation of Artery .....	4
Ligation of Artery with Selverstone Clamp .....	10
Avulsion of Nerve .....	4
Neurectomy .....	5
Removal of Neuroma .....	3
Nerve Decompression .....	6
Nerve Anastomosis .....	2
Reopening of Wound with Evacuation .....	5
Reopening of Wound with Exploration .....	4
Reopening of Wound with Further Removal .....	5
Reopening of Wound with Repacking .....	1
Reopening of Wound with Drainage of Infection .....	1
Resuturing of Wound .....	5
Miscellaneous .....	27
Plaster Cast .....	12
Ventriculo-Peritoneal Shunt .....	1
Cerebral Arteriography — Percutaneous .....	314
Aortograms .....	17
Pneumograms .....	52
Tracheotomy .....	6
TOTAL .....	<u>1076</u>

## CAUSES OF DEATH

Head Injury .....	26
Tumour .....	14
Aneurysm .....	6
Cerebral Haemorrhage .....	9
Subarachnoid Haemorrhage .....	12
Subdural Haematoma .....	10
Meningitis .....	3
Encephalitis .....	2
Thrombosis .....	8
Carcinoma (General) .....	14
Glioblastoma Multiforme .....	5
Other Systems .....	7
TOTAL .....	<u>116</u>







