

NEUROIMAGE

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MUHC-MNH

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Mr. Hodge

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Portrait of Charles Hodge in 1992 after
his election to the Order of Canada

WORD FROM THE EDITOR

This issue of Neuro Image was planned primarily to be a tribute to Charlie Hodge who passed away last spring, and whom many of you have known as the colorful chief of NeuroPhotography.

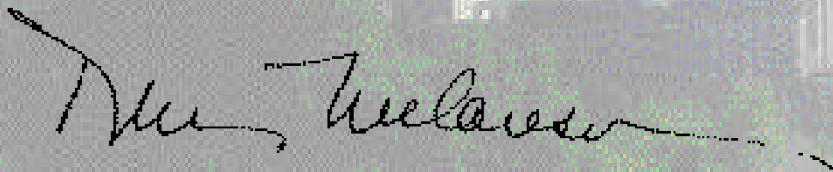
Dr. Feindel has prepared a retrospective of his career in the next pages.

Sandra MacPherson also reports on the creation of the new William Feindel Chair in Neuro-Oncology and its official inauguration on May 16, 2001.

I had announced in the April issue that the bulletin would now be on the Web. You will find this one, and previous issues, at <http://www.mni.mcgill.ca/neuroimage>

In the next issue,

A look at orbital pathology, Drs Jana Taylor and Jeffrey Chankowsky
Unusual mature teratoma, Drs Ronald Pokrupa and Marie-Christine Guyot



Denis Melanson
Neuroradiology
McGill University Health Center
MUHC-MNH

**Best regards Saluti affettuosi
Respetos Salutations amicales Afectuosamente
Saudações Herzliche gruesse
O Genki De Namaste Cordialmente**

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CHARLES HODGE, MC, FRPS, FBPA, FIMI (1924-2001) NEUROPHOTOGRAPHER EXTRAORDINAIRE

BY WILLIAM FEINDEL, OC, MDCM, FRSC

AN INAUSPICIOUS START

In 1945, at age 21, Charles Hodge became head of the Department of Neurophotography at the Montreal Neurological Institute. His only credential for this responsible and exacting job was his enthusiasm for photography acquired a few years earlier through the use of a Kodak box camera. However, he certainly had a protracted exposure to medicine in general. From the age of 12 he spent 3 years as a patient in the Royal Victoria Hospital, after he was severely burned by a fire in a model airplane shop. During his recovery period he went through an agonizing series of skin grafts and reconstructive surgery. For his first job, he accepted an offer to work as an assistant in photography, without pay, at the MNI. Six months later, Peter Hayden, the Neuro's experienced

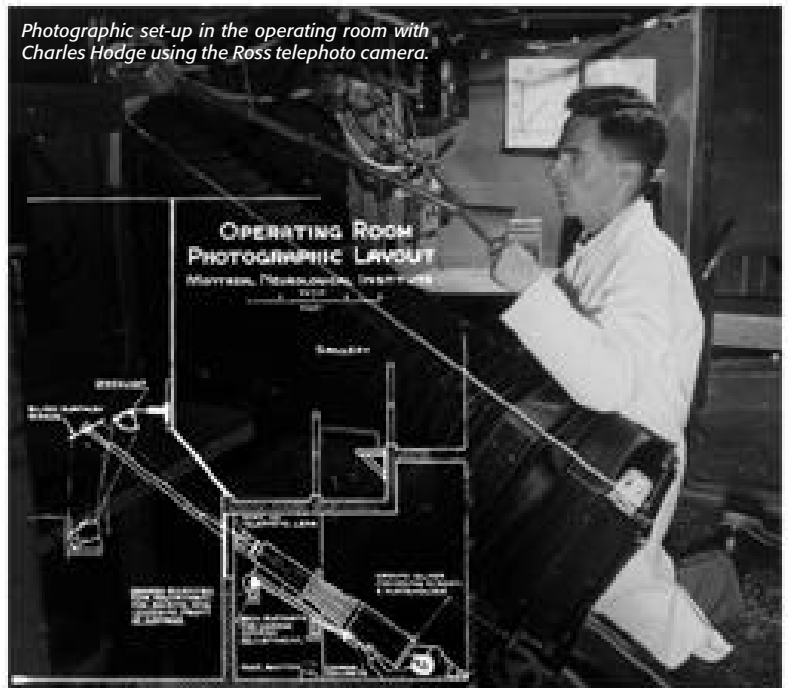


The first Neurophotography Darkroom, 1945

medical photographer, decided to leave. So Dr. Wilder Penfield asked Charlie to take over the department, which he then headed for nearly fifty years.

Charlie gave himself a crash course in medical photography, somewhat stimulated by the exacting demands of Dr. Penfield for special photography of the epileptic cases in the operating room and by the usually urgent requests of Dr. Bill Cone for pictures of pathological specimens, surgical instruments, operative procedures and tests on patients. Charlie read all the photography books he could lay his hands on and attended meetings of photographic associations. If Dr. Penfield was not satisfied with the pictures taken in the operating room, he would call Charlie into his office and patiently go over with him how the photos might be improved.

During his half-century of dedicated service to the Neuro, Charlie Hodge became well known



Photographic set-up in the operating room with Charles Hodge using the Ross telephoto camera.



Charles Hodge with a group of Neuro Fellows – Drs. Ushio, Leblanc, Nukui, Kinoshita

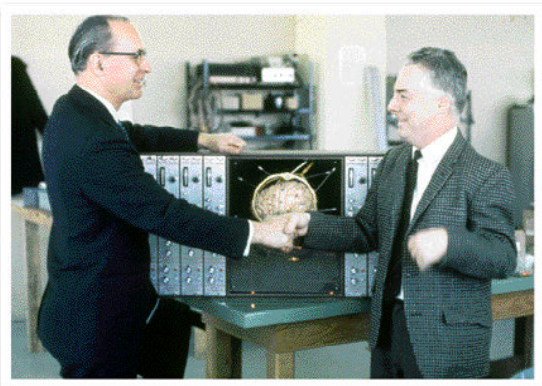
to all the staff members, the nurses and particularly to the residents and research fellows. He provided them with endless teaching materials for rounds and conferences and for their research and publications. When shown at national and international meetings, slides and posters from the Neuro set a standard of excellence.

Neurophotography, in the original MNI building (now the Rockefeller Pavilion), was located on the first floor, just across the corridor from the information desk at which a charming secretary worked, Eileen Robinson. In 1950 she married Charlie Hodge and became his devoted lifelong companion.

AN INNOVATIVE PHOTOGRAPHER

Charlie showed great interest and staying power for developing new photographic techniques. In the 1950s, he helped Dr. Cone with the use of the Knebel 35-mm strobe-light camera, which gave the surgeons convenient play by play records of their operations.

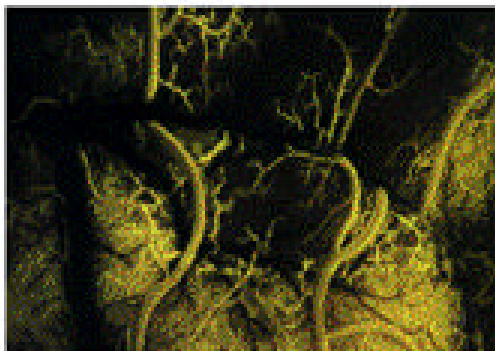
But his best known innovation was the invention in the mid-1960s of the highly specialised photographic technique for recording in the Cone laboratory and in the operating room the blood flow in the surface vessels of the brain. This procedure, which we called fluorescein angiography of the brain (FAB), could only have been created with Charlie's energy and persistence in grappling with formidable technical problems.



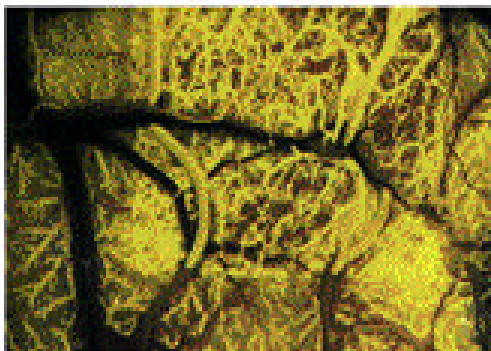
William Feindel and Charles Hodge greet each other in front of a model of the radioisotope method for measuring blood flow during brain surgery (1969).

Although the fluorescence of the dye flushing through the brain looked brilliant, the amount of light to expose the film was actually quite low. With ingenious originality, he processed Kodak 35mm colour film with ASA of 160, the fastest at that time, to obtain the equivalent of 1500 and eventually up to 4000. He also cleverly worked out in immense detail the use of complex colour filters.

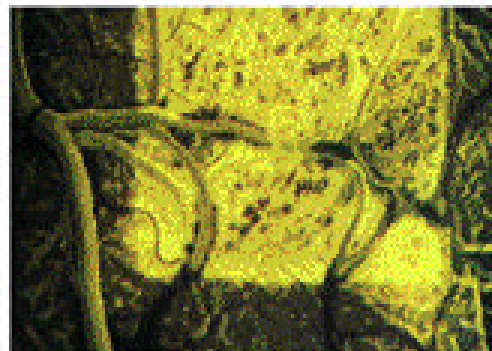
Arterial Phase



Capillary Phase



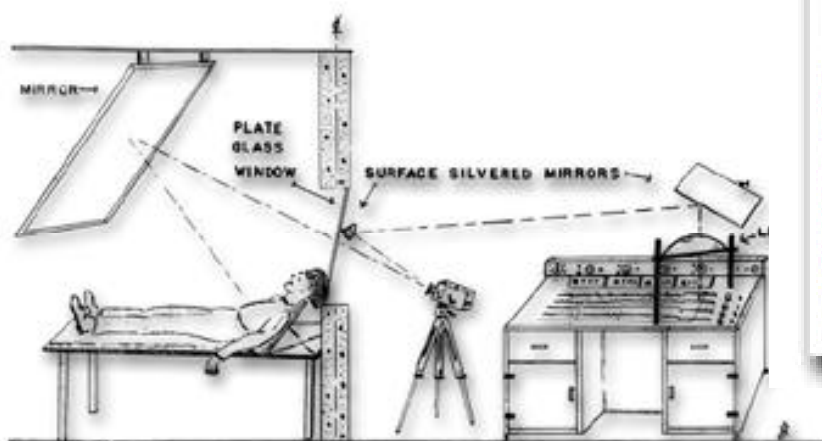
Venous Phase



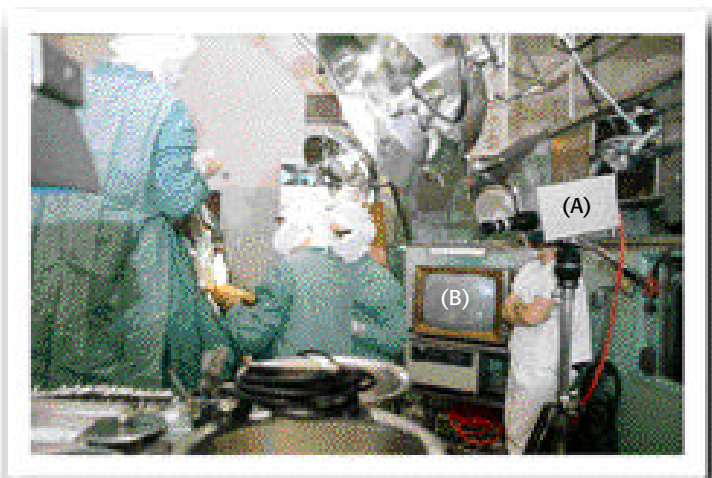
Fluorescein angiography of the dog brain. After cold application at minus 65 degrees C for one minute, the brain would appear under normal light to be only moderately suffused. But on FAB a striking change shows leakage of dye from the damaged microvessels. These studies illuminated the mechanism of cold-induced cerebral edema.

The fluorescein dye was injected into the arterial supply of the brain; a selective filter was then used to excite the dye by a stroboscopic light flashing at 1/10000 of a second and the fluorescence photographed through the filtered lens of a Nikon motor-driven camera. A special timer precisely recorded the fast sequential frames. The whole event took only 10 to 15 seconds. Charlie extended the method after many trials and errors to display the rapid phases of the epicerebral circulation on video for instant play-back in the O.R.

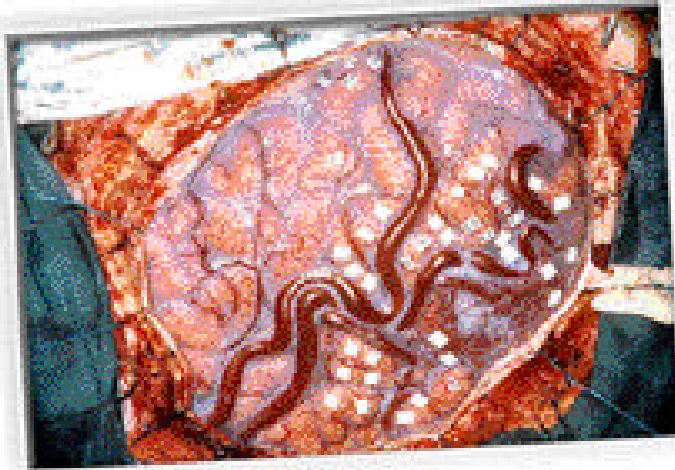
We applied this method in the Cone Laboratory for many experimental studies of cerebral ischemia,



Set-up in the EEG for ciné split-frame to show patient with seizures and EEG recording.



Video camera (A) and color monitor (B) to analyze the epicerebral circulation of the human brain by FAB

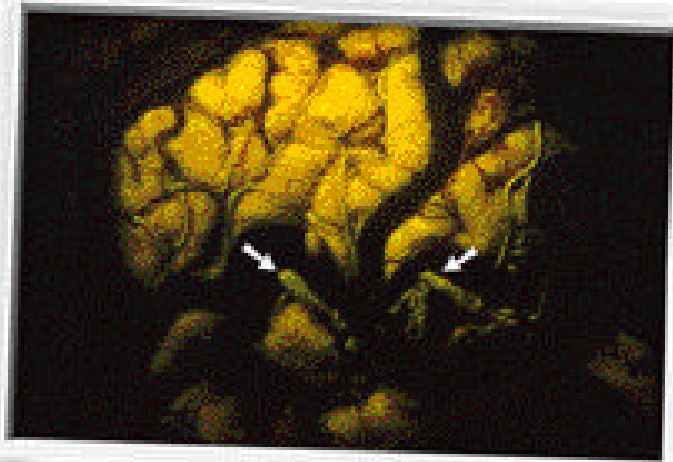


Arteriovenous malformation of the brain with stimulation tickets mapping the speech area. Arteries and veins appear the same.

arterial anastomosis, injury of the cortex, selective venous occlusion and the effects of carbon dioxide, prostaglandins, ethanol and anti-histamines on vasospasm. It disclosed new dimensions of information on the epicerebral circulation and in particular, its microvascular component. Over the decade from 1966 to 1976 with Lucas Yamamoto and others, we published about 50 scientific articles co-authored with Charlie and presented our results at many international conferences.

Charlie modified FAB for use in the operating room, where it was combined with radio isotope blood flow studies to provide many new observations on the microcirculation of the human brain, such

as laminar flow in veins, the identity of shunting in "red veins" and the "cerebral steal" phenomenon, as well as changes in the blood-brain barrier of tumours. But a unique value of the method was to define precisely the arteries on the surface of the brain that supplied large arteriovenous angiomas. These could then be accurately occluded after which repeat FABs could monitor the degree of reduction in the flow through the angioma, the completeness of excision under controlled conditions and the preservation of the blood supply to the adjacent cortex. Angiomas bordering the mapped motor and speech areas, previously rejected as inoperable, could thus be safely and completely removed without producing neurological deficit.



FAB revealing 2 feeding arteries (arrows) to the angioma, made out on video playback.

In the mid 1960s, we began to use double projection of FAB slides to show the "before" and "after" of experimental conditions, for example, to display the area of ischemia after clipping a branch of the middle cerebral artery or the effects on the microcirculation after a freezing lesion that caused cerebral edema. Charlie often travelled to meetings with Lucas Yamamoto and myself to demonstrate this dual projection, since no one else was doing it at that time. It proved such an advantage that we began to use it for our lectures at the Neuro and it became widely adopted by others. One of Charlie's lasting contributions was to draw up audiovisual specifications for the Timmins Amphitheatre of the Webster Pavilion, with its splendid panoramic screen designed to show three or more full images simultaneously.

HONOURS AND RECOGNITION

The achievements of Charles Hodge was the first Canadian to be elected a Fellow of the Biological Photographic Association (1958). He was given the first William Gordon Award (1969) for outstanding biophotography in Canada. He was winner of the gold medal (1970) of the combined Royal Colleges of Physicians, Surgeons, Obstetricians and Gynecologists and the Royal Photographic Society of Great Britain (the only photographer in North America to have this distinction), and a Louis Schmidt Laureate (1975), the highest honour of the



Charlie receives the Diploma of Honorary Fellowship in the Royal Photographic Society (1984)

BPA. He became Honorary Fellow of the Royal Photographic Society of Great Britain (1984) and Honorary Fellow of the Institute of Medical Illustrators of Great Britain (1990). In 1992 he was appointed to the Order of Canada.

During the latter stage of his career, Charlie worked diligently to catalogue on computer more than 200,000 colour and black and white negatives in Neurophotography to make these more accessible for the research and clinical staff of the Institute. This collection includes detailed photographs of some 4,000 seizure operations with cortical stimulation points, undoubtedly the most extensive record of its kind in the field of epilepsy surgery.



Charles Hodge and Wilder Penfield at a Neuro social occasion (1973). In the background, Dr. Eva Andermann and Mrs. Wilder Penfield, Jr. (Berry)

ENVOY

Hundreds of Fellows of the Neuro at the end of their training were presented with the familiar photograph taken by Charles Hodge of the MNI building in 1954. This will continue to remind them of Charlie's great talents, his key role in providing the photographic records for their research and clinical studies, and his traditional photographs of the Neuro staff that were documented in each annual report over many years. And beyond that, we will recall his warmth to his friends and his cheerful fortitude in overcoming substantial handicaps to become one of the best scientific photographers of his era.

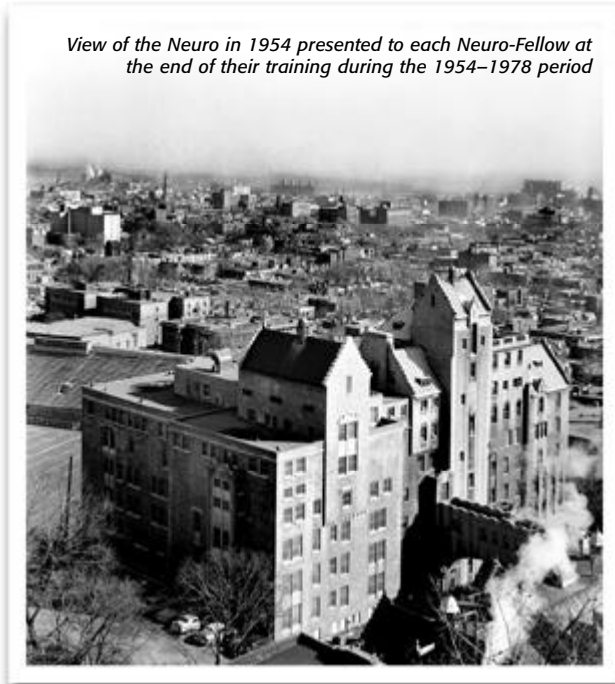
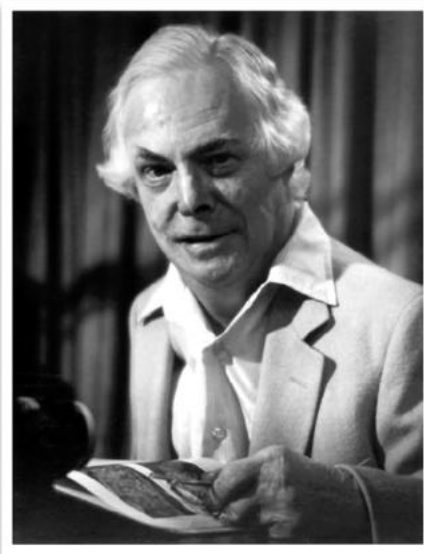
A Charles Hodge Memorial Fund has been established at the MNI to which many of Charlie's friends and admirers have already contributed.

Donations may be sent to:

**The Director,
Montreal Neurological Institute,
3801 University Street,
Montreal, QC H3A 2B4**

and marked for that fund. Tax deductible receipts will be issued.

Thanks to J.P. Acco and Neurophotography staff for graphic design © William Feindel, 2001



View of the Neuro in 1954 presented to each Neuro-Fellow at the end of their training during the 1954-1978 period

IMAGES OF “MOYA-MOYA” ARTERITIS

ROLAND BRASSARD, M.D. AND DANIEL GENDRON, M.D.

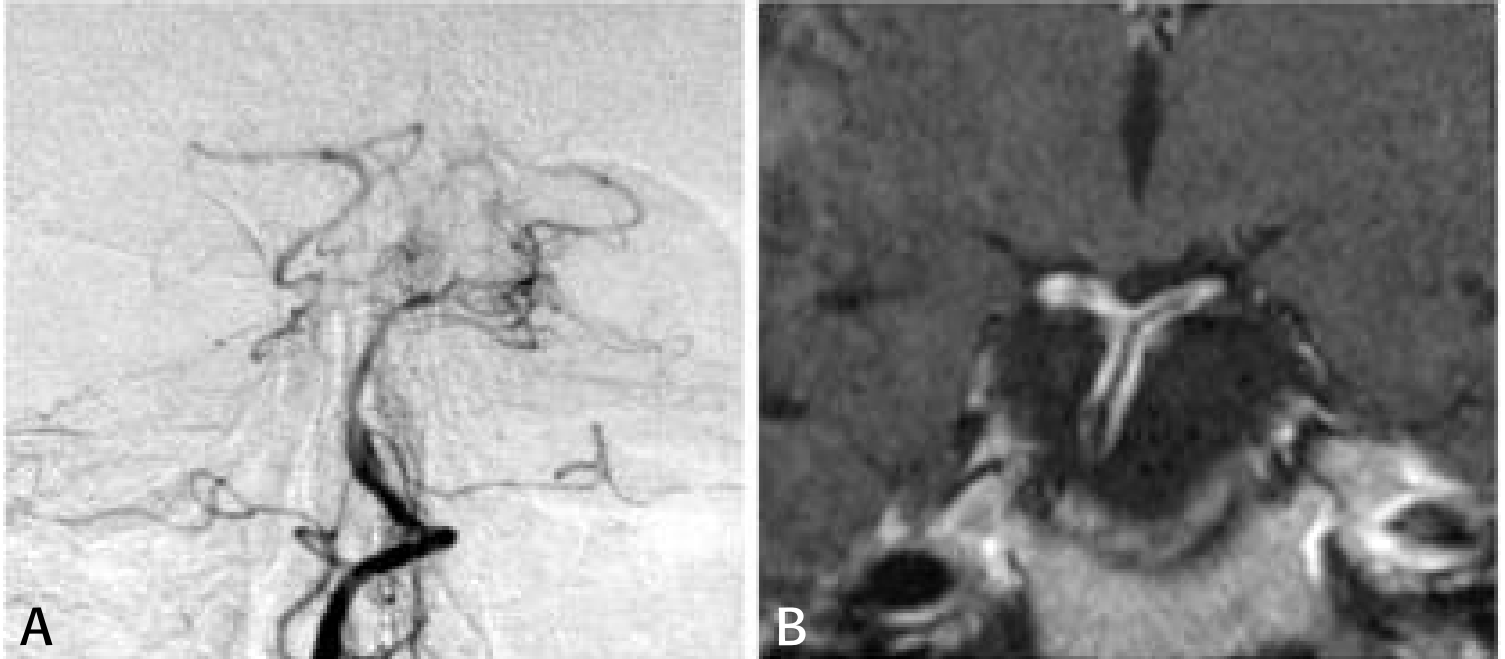
A 37 year old male who developed in early August 2000 severe headaches with mild right hand numbness and clumsiness. When seen in E.R. he had a mild right hemiparesis with right hand sensory loss and a right homonymous hemianopsia. Initial imaging showed an infarct in left posterior cerebral territory and other areas of ischemia in left frontal lobe. A lumbar puncture was done and normal.

He was initially treated with high dose IV steroid on the assumption of an aggressive cerebral vasculitis.

Despite steroids, a few weeks later, he developed more severe hemiparesis and he underwent a non-dominant temporal lobe meningeal biopsy which was unhelpful, not showing vasculitis.

A trial of IV steroid with monthly IV cyclophosphamide was attempted, but despite this, his state worsened and he got completely hemiplegic on the right and aphasic. He has been, in the spring of 2001, treated with a bilateral cerebral vascular bypass procedure to improve cerebral blood flow.

We have considered his disease to be a form of “Moya-Moya”-type arteritis.



(A) frontal view of arterial phase of right vertebral angiogram: note the narrowing of the lumen of the basilar artery, and more severely of the right posterior cerebral artery. Compare with the appearance of same vessels on (B) coronal T1-weighted image with Gadolinium: the residual lumen is flow/void while the arterial wall is enhancing.

THE NEW WILLIAM FEINDEL CHAIR IN NEURO-ONCOLOGY AT THE NEURO

MONTREAL: A WORLD CLASS CENTRE FOR BRAIN TUMOUR RESEARCH

On May 16, 2001, the Montreal Neurological Institute and McGill University inaugurated the William Feindel Chair in Neuro-Oncology. The Chair was created thanks to a donation of \$2.7 million from Cynthia Molson-Baxter and her family to the Clive Baxter Memorial Endowment Research Fund.

Establishing this first Chair in brain tumour research at McGill University allows the Brain Tumour Research Centre (BTRC) at the MNI to attract internationally recognized brain tumour researchers and clinicians to work in Montreal and puts Montreal at the forefront of the field. The first recipient of the Chair is the Scientific Director of the new BTRC, Dr. David Kaplan. Dr. Kaplan co-discovered the gene that controls the survival, development and repair of many cells in the nervous system.

This new Chair is the 4th at the MNI and the 44th Chair in the Faculty of Medicine at McGill University. It honours the dedication of Dr. William Feindel, Neurosurgeon, Professor and former Director of the MNI (1972-1984), in treating brain tumour patients. Dr. Feindel treated Mr. Baxter and was inspired by his courage. "I am deeply touched to have this Chair in Neuro-Oncology named after me, and I think that Clive (Baxter) would be proud of what we have accomplished".

The commitment of the Baxter family and friends toward advancing brain tumour research also honours the memory of Mr. Clive Baxter. Mr. Baxter was an award-winning journalist for *The Financial Post*, who in 1973 at the age of 42 was diagnosed with a malignant brain tumour. Mr. Baxter became dedicated to informing others about the treatments available for brain tumours and to heightening awareness of the need for research into brain diseases. Although operations, radiation, and chemotherapy temporarily stopped the progression of the brain tumour, Mr. Baxter died in 1980.



Unveiling the William Feindel Chair in Neuro-Oncology.
From left to right: Dr. William Feindel, Cynthia Molson-Baxter,
Dr. David Kaplan and Dr. Donald Baxter.



A packed audience gathered in the Jeanne Timmins Amphitheatre to celebrate the inauguration of the William Feindel Chair. Seated in the front row were Cynthia Molson-Baxter, Dr. William Feindel and McGill Principal, Dr. Bernard Shapiro.