In this paper we describe the life and contributions of Arthur Roland Elvidge, Wilder Penfield’s first neurosurgical recruit to the Montreal Neurological Institute (MNI), and the first neurosurgeon in North America to use cerebral angiography as a diagnostic test. The importance of Elvidge’s contribution resides in his technical skills, scientific legacy, profound influence as a teacher, and in his role as an innovator. Beyond these, his significance lies in the combination of attributes that modeled for a generation of neurosurgeons the characteristics that the profession required. Modern ideas about classification of neuroepithelial tumors and the diagnostic utility of cerebral angiography owe much to Arthur Elvidge’s perseverance. Elvidge did not keep a diary or write memoirs, and he never married, thus when he died there were few who took a personal interest in his papers or belongings. However, rather than present Elvidge as a neurosurgical icon, we focus on his work in the context of the liaison between scientific observation and clinical practice that characterized neurosurgery in the middle third of this century.

Early Years

Elvidge was born on July 3, 1899 in London, England of distinguished Dutch–English parentage. His maternal grandfather, a wildlife artist and illustrator, settled in London at the invitation of the British Museum. The Elvidge family immigrated to Canada when Arthur was approximately 12 years old, settled in Ottawa, and eventually moved to Montreal.

After completing high school and working for a year, Elvidge joined the Canadian forces at the age of 17 and served as a signaller and gunner in the 10th Canadian Battery Field Artillery during World War I. He fought in France and Belgium (including Passchendaele) from 1916 to 1918.

Historical Vignette

Arthur Roland Elvidge (1899–1985): contributions to the diagnosis of brain tumors and cerebrovascular disease

MARK C. PREUL, M.D., WILLIAM FEINDEL, M.D., F.R.C.S.(C), T. FORCHT DAGI, M.D., F.C.C.M., JOSEPH STRATFORD, M.D., F.R.C.S.(C), AND GILLES BERTAND, M.D., F.R.C.S.(C)

Division of Neurosurgery, Department of Neurology and Neurosurgery, Montreal Neurological Institute and Hospital, McGill University, Montreal, Quebec, Canada; and Division of Neurosurgery, The Medical College of Georgia, Augusta, Georgia

The contributions of Arthur Elvidge (1899–1985), Wilder Penfield’s first neurosurgical recruit, to the development of neurosurgery have been relatively neglected, although his work in brain tumors extended the previous work of Percival Bailey and Harvey Cushing. He published rigorous correlations of clinical and histological information and formulated a revised, modern nosology for neuroepithelial tumors, including a modern histological definition of glioblastoma multiforme. Well ahead of his time, he believed that glioblastoma was not strictly localized and was the first to comment that the tumor frequently showed “satellitosis.” He was the first neurosurgeon in North America to use angiography as a radiographic aid in the diagnosis of cerebrovascular disease. Having studied with Egas Moniz, he was the first to detail the use of angiographic examinations specifically for demonstrating cerebrovascular disorders, believing that it would make possible routine surgery of the intracranial blood vessels. Seeking to visualize all phases of angiography, he was the impetus behind the design of one of the first semi-automatic film changers. Elvidge and Egas Moniz made the first observations on thrombosis of the carotid vessels independently of each other. Elvidge elucidated the significance of embolic stroke and commented on the ischemic sequelae of subarachnoid hemorrhage. Besides his contributions to neurosurgery, he codiscovered the mode of transmission of poliomyelitis. Elvidge’s soft-spoken manner, his dry wit and candor, mastery of the understatement, love of exotic travel, and consummate dedication to neurosurgery made him a favorite of patients, neurosurgery residents, nurses, and other hospital staff. His accomplishments and example as teacher and physician have become part of neurosurgery’s growing legacy.

KEY WORDS • Arthur Elvidge • brain tumor • cerebral angiography • neurosurgical history • neurosurgical technique
Arthur Elvidge

Scientific and Surgical Training

After the war, Elvidge entered medical school at McGill University, receiving his Doctor of Medicine Master of Surgery degree in 1924. Along with medical school, he spent 4 years in the Department of Physiology on a Cooper Research Scholarship and Demonstratorship, and earned Master of Science and Doctor of Philosophy degrees for research on the reticuloendothelial system and immunity. Between 1926 and 1932, Elvidge also examined the reactions of blood cells during intravenous administration of foreign particles. This work later led to an interest in the vascular system of the brain and to novel ideas regarding tumor classification.

In 1928, Elvidge began training in surgery at the Royal Victoria Hospital in Montreal under Dr. Edward Archibald, Canada’s first neurosurgeon and a pioneer in chest surgery. Elvidge then came under the influence of Wilder Penfield and William Cone, who had recently moved from New York to Montreal. His decision to train in neurosurgery may well have been determined by the excitement that Penfield and Cone were generating at the Royal Victoria Hospital in Montreal under Dr. Edward Archibald. Penfield and Cone evolved during their earlier neurocytological studies at the Presbyterian Hospital of Columbia University.9,57–61

Travel Abroad and First Exposure to Angiography

In 1930, Elvidge became a neurosurgical consultant to the Montreal General Hospital. In 1932, following in the footsteps of Archibald and Penfield, Elvidge traveled abroad for postgraduate studies, including periods spent in London at the National Hospital for Nervous Diseases and in Lisbon to work with Egas Moniz, the Portuguese neurologist who had introduced angiography of the brain 5 years earlier.

At that time Egas Moniz was using angiography mainly to demonstrate the blood supply to brain tumors. Despite the importance of this work, Egas Moniz was not well known in the English-speaking world because he wrote in French rather than English. Elvidge may have become interested in this new technique as a result of his earlier physiological studies, including those of circulating particles in the blood. He may also have been encouraged by Penfield, who no doubt wanted Elvidge to return with experience in angiographic techniques for the express purpose of improving the diagnosis of brain tumors and investigating the cerebral vasculature involved in epilepsy.

Return to Montreal and Appointment to the Montreal Neurological Institute

In 1932 Elvidge became a full-fledged member of the MNI, alongside Penfield and Cone. In 1933, he formally joined the neurosurgical staff of McGill as Lecturer in Neurosurgery. He was the first person to be recruited by Penfield and Cone for the newly formed department of neurology and neurosurgery.

Elvidge, like Cone and Penfield, managed his own neurosurgical service. Many cases at the MNI were referred to him by Cone; some, such as the malignant gliomas, were those that the other neurosurgeons may have thought difficult or hopeless. However, Elvidge relished these problems. With his skill and enthusiasm, he began to enjoy many successes, and his practice gradually expanded.

Surgical Technique

Elvidge was a frugal surgeon. Possessing an uncanny sense of surgical judgment and timing, along with great technical skill, he insisted that an effective surgeon be capable of operating with a small number of familiar instruments. Elvidge probably developed this bias in the course of his general surgery training at the Royal Victoria Hospital in Montreal. For Elvidge, the surgical armamentarium included fingers.

Although “finger surgery” was seen as somewhat unrefined, Elvidge preferred to use his exploring fingers deliberately to pick up the arteries penetrating the tumors so that they could be isolated, clipped, and divided. In this way he accomplished gradual devascularization of large tumors, especially meningiomas, as the circumference was dissected out. Although Penfield and Cone did not use finger dissection, it should not be assumed that Elvidge was less skilled, more impatient, or impulsive. On the contrary, he was deliberate and careful. A former resident remarked that Elvidge seemed to have “eyes on the ends of his fingers.”

In most instances Elvidge imitated Cone with respect to surgical technique. For craniotomies, he adopted Cone’s principles for myoplastic and osteoplastic craniotomy, even to the extent of borrowing Cone’s diagrams in several papers.3,5,10,38,62

Contributions to the Study of Gliomas

Elvidge held a deep personal devotion to his patients, especially those with brain tumors. His long interest in this subject led to a series of classic publications. His first paper about brain tumors, coauthored by Penfield and Cone in 1935, reported the largest series of these lesions amassed since the seminal publications of Bailey and Cushing in 1926 and Cushing in 1932. The paper on gliomas reflects a number of concepts relating to the growth and classification of these tumors that Penfield and Cone evolved during their earlier neurocytological studies at the Presbyterian Hospital of Columbia University.9,57–61

Because the earlier classification scheme for gliomas published by Bailey and Cushing had not withstood review in large series, Elvidge, et al., proposed to ascertain and recognize by simple histological statistics... the absolute criteria upon which a histological diagnosis [for glial tumors] may be made, stating more precisely and concisely their constant and inconstant peculiarities so as to make their recognition simpler.

He carefully studied patient data, including survival, tumor location, and, most important, histological appearance, with the goal of deriving some diagnostic and prognostic significance from a new nosology.

After working with [the Penfield–Cone] classification for eleven years, it has become apparent that the character of certain subgroups is different from what was anticipated; other subdivisions seem to be unnecessary, while the astrocytomas divide themselves into three well defined groups. This further
largest series of glioblastomas multiforme (495 cases) treated by external irradiation. This report correlated coauthored a report on one of the largest series of gliomas work that followed was of equal significance. In 1945 he impetus to the identification of what we know of as anaplasia of necrosis, mitosis, fibroblastic overgrowth, increased vascularity, adventitial proliferation, small cyst formation, and surrounding glial reaction. Well ahead of his time, Elvidge believed that these tumors were not strictly localized. He noted that they frequently showed “satellitosis,” and suggested that those satellites might have effects, including spread of the tumor, in areas seemingly remote from the main tumor mass. In the same paper he added impetus to the identification of what we know of as anaplastic oligodendroglioma and the various subtypes of ependymoma.

Elvidge did not publish other articles on brain tumors until nearly 10 years after his first paper. Nevertheless, the work that followed was of equal significance. In 1945 he coauthored a report on one of the largest series of gliomas treated by external irradiation. This report correlated patient outcome and survival with tumor malignancy and histological findings. Other reports, including the largest clinicopathological survey of gliomas at the time, followed in the 1950s and 1960s. He compiled the largest series of glioblastomas multiforme (495 cases) and was one of the first investigators to analyze the occurrence of seizures caused by astrocytomas (Fig. 1). He also wrote articles on medulloblastomas and cerebellar sarcomas. After his retirement, he compiled one of the most carefully studied and often cited series of ependymomas, again characterized by its adherence to rigorous correlation of histological and clinical information.

The Influence of Penfield and Cone

Penfield’s influence is most obvious in Elvidge’s early involvement in the study of gliomas and angiography. In addition, because of Penfield, Elvidge took a keen interest in electroencephalographic (EEG) techniques.

However, William Cone may have influenced Elvidge more deeply. They were the same age, and because of Cone’s driving passion for work and his willingness to undertake the majority of neurosurgery at the MNI, Elvidge spent more time during his neurosurgical training with Cone than with Penfield. Cone’s influence was also to be found in Elvidge’s interest in head trauma. During the 1930s and 1940s, Elvidge gained significant recognition for articles detailing the physiological effects of head injuries and methods for their rapid treatment. He became particularly interested in the causal mechanisms of posttraumatic consequences of head injury, including convulsions and other visual, sensorimotor, and psychological phenomena. With Herbert Jasper, he suggested that EEG studies could aid in locating focal cerebral injury in cases in which the clinical and radiographic examination did not suffice. With Herbert Jasper, he suggested that EEG studies could aid in locating focal cerebral injury in cases in which the clinical and radiographic examination did not suffice.

The depth of Elvidge’s attachment to Cone was made particularly evident in the obituary that he wrote for the Journal of Neurosurgery at the time of Cone’s death in 1959. Elvidge noted that Cone’s devotion to his patients and his clinical abilities “crowd upon the memory of those who saw him work. . . . I saw him come and I felt him go.”26,33 After Cone’s death, Elvidge became Neurosurgeon-in-Chief at the MNI as well as the Royal Victoria Hospital and the Montreal General Hospital.

A Monograph on Angiographic Techniques Heralding Surgical Treatment of Cerebrovascular Disease

Although Elvidge considered his work on glial tumors to be his greatest contribution to neurosurgery, his work in the field of cerebral angiography may have had a greater impact. He was the first neurosurgeon in North America to use angiographic studies routinely for the radiographic diagnosis of cerebrovascular disease.

Elvidge returned from Portugal in 1934, the year the MNI opened, and began to apply what he had learned from Egas Moniz. In 1937, Elvidge presented his classic paper, “The cerebral vessels studied by angiography,” at the Association for Research in Nervous and Mental Disease in New York. This monograph was the first to detail the use of angiography specifically to demonstrate cerebrovascular disorders. Elvidge described the contrast medium Thorotrast and explained his method of injection after induction of local and general anesthesia. He characterized the normal arterial and venous phases, considered how various main arteries could be visualized by altering the flow or injection, and contrived a means to film the rapid filling of the arterial phase on successive radiographic plates. In the last section of the paper, “Pathological Observations,” Elvidge outlined what he believed to be the place of angiography:

. . . [W]e have restricted its use to patients thought to be suffering from some vascular abnormality or vascular neoplasm [arteriovenous malformation] . . . in the hope that it may pave the way to rational therapy, whereas we were this procedure withheld treatment might be misdirected or impossible. Incidentally the presence of a vascular lesion may throw some interesting light upon the cerebral circulation.
To illustrate his belief in the potential importance of angiographic studies for vascular disorders, Elvidge illustrated his points by showing an arteriovenous malformation (AVM) involving the right central cortex (Fig. 2), an AVM involving the right internal carotid artery (ICA) and the cavernous sinus, an abnormal arterial pattern of a probable cerebral scar of the right frontal lobe, angiograms of cases of bilateral ICA aneurysms (one giant), and two cases of smaller ICA aneurysms. Indeed, among his photographs of pathological correlated with angiographic studies, Elvidge included only one case of tumor and that was used to reveal a deformed carotid siphon. He concluded: “The practical implications from the gradually increasing knowledge of the physiology of the cerebral circulation have made it imperative to develop methods for the visualization of the cerebral vessels in living subjects. The relative ease and safety of intracranial operations make it more and more probable that surgery of the intracranial blood-vessels will play an increasingly important role.”

The Jesus Machine

A significant limitation of angiography was the lack of a method by which radiographic plates could be rapidly exchanged to visualize blood flow through the arterial, capillary, and venous phases. During the mid-1930s, Elvidge began to experiment with a mechanical system to solve this problem. He enlisted the help of a Spanish research fellow at the MNI, Jesus Sanchez Perez. Perez fashioned a changer from castoff materials, including a bicycle chain and pedal, and adapted it to stereoangiography. Elvidge was so impressed with the inventiveness and utility of this machine, even though it clanked very loudly, that he nicknamed it the “Jesus Machine.” This machine was one of only three semiautomatic film changers in existence at the time.

Continued Use of Angiography at the Montreal Neurological Institute

Elvidge continued to develop the use of angiography over the next 20 years. First, he exposed the carotid artery in the operating room. Then the patient, still draped, was transported down the hall to the neuroradiology department. After the angiogram was obtained, the patient was brought back to the operating room in anticipation of a definitive surgical procedure to follow.

In contrast, Cone did not advocate angiographic examination. This attitude may have originated from an unfortunate incident that occurred in the mid-1930s. A Swedish physician visiting the MNI was invited by Elvidge to demonstrate his method of percutaneous carotid injection on a nurse who was thought to harbor a large frontal AVM. With her consent, the artery was injected. To everyone’s horror, the woman had a severe, unexpected reaction and died on the radiology table. Films taken at the time of injection revealed no contrast medium in the cerebral vessels. It was concluded that another substance may have been injected accidentally. Elvidge later noted that Cone, “... owing to objections raised against angiography in clinical work with present methods,” was loathe to adopt its use routinely. However, Elvidge was not dissuaded and adopted a technique of percutaneous carotid injection shortly after this incident.

Successful Intracranial Surgery of Anterior Circulation Aneurysms Guided by Angiography

In 1946 Elvidge used angiography and EEG studies to diagnose aneurysms of the anterior circulation in two cases. Both aneurysms were successfully clipped (Fig. 3), and one was excised. The paper describing these cases was presented to an audience, including Egas Moniz, at the 36th Meeting of the Society of British Neurological
Surgeons in Lisbon in 1947, and was published in 1950.\textsuperscript{40} Prior to that time, only nine reports existed of anterior circulation aneurysms that had been successfully treated by an intracranial approach. They had been packed, wrapped, or excised, but not clipped. At that time, most intracranial aneurysms, if surgically managed, were treated by carotid ligation.\textsuperscript{12-14,48-51,54-56,64,65,68,69,71-72} Elvidge believed that although “carotid ligation may be effective in the prevention of recurrent bleeding from aneurysms not only of the carotid artery but also those of the main cerebral vessels . . . [t]he local lesion . . . still remains and its behaviour over a long period is not predictable.”\textsuperscript{41} Elvidge’s report was the first publication stating that an anterior circulation aneurysm could be clipped and left in situ. The EEG study was suggested as a way of identifying the degree of dysfunction caused by the aneurysm hemorrhage, as an adjunct to localization, and as a means of evaluating the postoperative recovery. Preoperatively, the EEG studies showed a pulsation artifact in the leads overlying the region of the aneurysm. Because the electrographic disturbance was greater than expected from the amount of hemorrhage and brain damage disclosed at operation, Elvidge and Feindel concluded that the aneurysm hemorrhage was capable of causing “changes in the normal circulatory equilibrium with a resulting ischaemia of the cerebral tissue lying beyond the aneurysm.”\textsuperscript{41}

The second aneurysm may have had a traumatic origin. Elvidge, with typical understatement, refrained from reporting the excitement that actually surrounded the case. In the paper he wrote, “. . . when we were prepared to make the final delivery, the friable sac blew out unexpectedly with violent haemorrhage which was not satisfactorily controlled until three clips had been placed on a large vessel identified in a calmer moment as the right anterior cerebral artery. The sac was then excised. . . .”\textsuperscript{41} Feindel, Elvidge’s junior surgical intern, recounted the story between the lines. The original plan had included clipping but not excising the aneurysm. The sac was freed and four small feeding vessels were clipped. With the operation having proceeded so well up to that point, Feindel suggested that Elvidge might also excise the sac. For a moment Elvidge hesitated, but then began to dissect out the aneurysm to excise it. Suddenly the aneurysm ruptured with an arterial geyser. As he calmly placed his finger into the pool of blood and onto the aneurysm to halt the bleeding, Elvidge looked at Feindel and, in his slow monotone, uttered, “Thank you, Bill.” Within 5 minutes all was again under control, and the procedure went on to a successful conclusion. The macro- and microscopic pathological examination of the aneurysm was instructive, showing several small auxiliary feeding arteries to the sac, in addition to the main feeding artery. The wall of the sac lacked elastic and muscle fibers and consisted mainly of friable, organized thrombus.

### Identifying Carotid Atherosclerotic Disease

In 1937 Elvidge\textsuperscript{30} and Egas Moniz and coworkers\textsuperscript{23} made the first important observations on thrombosis of the carotid vessels independently of each other. In 1951 Elvidge elaborated on these initial findings in his last paper on angiography in cerebrovascular disease.\textsuperscript{43} This paper was written “to review the clinical facts and to determine whether it is justifiable to speak of a ‘syndrome of thrombosis of the internal carotid artery,’ and to record the value of angiography in the study of cerebral thrombosis.” He included cases of middle cerebral artery involvement. Elvidge drew on long-term clinical follow-up reviews, pneumoencephalography, and EEG studies, although the latter two did not figure prominently in his conclusions about pathogenesis and patient assessment. Among Elvidge’s conclusions were that angiographic examination could be used to localize the inferior limit of the clot thrombosis and that thrombotic occlusions appeared as a cone-shaped narrowing of the vessel. He cautioned that failure of the artery to fill with dye did not necessarily indicate thrombosis. He demonstrated that thrombosis of the carotid artery most commonly occurred near the bifurcation, followed by the petrous portion of the vessel. He did not believe that carotid thrombosis necessarily resulted in neurological deficit. He understood the significance of embolic stroke and concluded that “carotid hemiplegia” and “syndrome of thrombosis of the internal carotid artery” were inaccurate terms, because the clinical manifestations were not necessarily caused by involvement of the carotid, but by individual, more distal intracranial vessels. He preferred the term, “syndrome of occlusion within the internal carotid system,” and recommended that Krayenbühl’s method\textsuperscript{50} of periarterial sympathectomy, with occasional removal of a portion of the thrombosed ICA, merited further study.

### A Dedicated Teacher

As a dedicated tutor for the neurosurgical housestaff, Elvidge evoked great fondness and inspired respect as a teacher (Fig. 4). The system of choosing which residents would be on the Penfield, Cone, or Elvidge services left...
Elvidge the last choice. However, residents soon realized that it was perhaps on his service that they learned the most about general neurosurgery. Many residents identified with Elvidge and found him more approachable than Penfield or Cone. As Director of the MNI, Penfield’s time was taken up by day-to-day management duties; his surgical service tended toward more specialized problems, and he expected unremittingly high performance. Cone, Neurosurgeon-in-Chief and Neuropathologist, ran a grueling service that often exhausted his residents. Many residents found their experience on Elvidge’s service to be their most productive and enduring influence. “His quiet, calm, unhurried ways were not as dramatic as the two Americans [Penfield and Cone]. Every once in a while he would suddenly make an appropriate remark or a joke that exactly fitted the situation. His teaching was that way as well. A great deal of thought was given before he spoke.”

The story of the ruptured aneurysm illustrates Elvidge’s relationship with his residents. He usually included them in the decision-making process and the residents returned his regard. For a resident to have suggested the excision of an aneurysm sac to Cone or Penfield would have been quite unusual.

Elvidge was no stranger to long, torturous hours. One day the nurses found him asleep in the linen room after working for nearly 2 straight days. Unlike Cone, whose regular 7:45 p.m. return to the hospital was an announced event for attendance by his residents, Elvidge quietly slipped into the hospital anywhere from 8:00 to 11:00 p.m. Nurses would then alert the residents to join him as he made rounds and started his ritual of selecting operative cases for the next day. He interviewed and examined each of his patients and left on their chart a written summary of his findings and working diagnosis. Toward the end of rounds, he stood with the residents at the chart rack and pulled charts slightly out for those patients worked up for a surgical procedure. As he reviewed the cases with the residents, some of these charts were pulled out or pushed back in slightly more than the others, depending on how far along the clinical workup had proceeded or how interesting the case might appear. When one chart stuck out farther than any of the others, Elvidge happily listed that patient as the first case for the next day.

Surgical Triumphs

Residents loyal to Elvidge enjoyed the chance to present his surgical results at weekly grand rounds and remember his dry wit, candor, and soft-spoken mastery of understatement, which made for humorous encounters. During one grand rounds presentation, for example, the radiologist, Donald McRae, had reviewed the films of a very large intracranial tumor in some detail. The description of the complicated surgical maneuvers involved in removing such a monstrous lesion was anticipated with great suspense. When it came time to review the procedure, McRae looked at Elvidge and inquired, “Now Arthur, tell us, how did you accomplish this fantastic feat?” Elvidge replied anticlimactically, in a rather matter-of-fact monotone, “Well, [pause] I think we [pause] took it out,” indicating that he had scooped the tumor out with his fingers. The room remained silent and McRae’s hopes for a spectacular recitation were dashed.

Another man harbored a large meningioma arising from the cribriform plate, seen as calcification on plain x-ray films and well defined by the grossly displaced anterior cerebral arteries evident on angiographic studies. Having been selected for surgery by Elvidge late one night, the patient, who had been asleep on the ward, was suddenly awakened as the nurses rapidly wheeled him in his bed to the examining room. As the patient tried his best to be alert, Elvidge explained in his usual friendly manner that the man had a tumor, probably benign, which would mean an operation. The patient’s initial shock at this news was not relieved when Elvidge described it as the size of an orange, or after the patient asked, “When would you do the operation, Doctor?” and Elvidge quietly replied, “Well . . . we were thinking of tomorrow . . . actually.” Next day, the removal, via a bifrontal craniotomy, went without complication. The tumor was removed in several large pieces which were reconstructed, and photographed in the anterior fossa of a skull, to make an impressive sight. The patient, quite well, and a slide of the tumor “in situ” were presented at grand rounds, evidently a great success.
After the case presentation, Penfield severely announced to the audience, “Grand rounds are not to present surgical triumphs!” With a confident smile in return, Elvidge seemed pleased that the residents had prepared and presented the case, although Penfield, and, to a lesser extent Cone, did not appreciate being upstaged.

An Amiable Personality

Arthur Elvidge became a highly regarded member and leader of many professional organizations. He served as President (1956–1957) of the American Academy of Neurological Surgery (where he was a great favorite) and President (1964) of the Canadian Neurological Society. During World War II he served as a Major with the 6th Canadian Field Ambulance (Fig. 5) and also gave freely of his time on several overseas medical aid missions.

Although somewhat shy, Elvidge added as much individuality and personality to the MNI as did Penfield and Cone. Patients would at first often not regard Elvidge—extraordinarily good natured, relaxed, and friendly—as a brain surgeon (Fig. 6). This was largely because in speaking with them he used such plain language that none of the
procedures sounded very complicated. In an era when many surgeons did not talk to their patients, this was unusual. His patients revered him for his plain-spoken approach and his ability to put them at ease. Although he maintained a low profile and remained somewhat of a mystery, Elvidge “always had time to speak with you.”6

Traveling the World

Arthur Elvidge had a private passion for exotic travel (Fig. 7). Every summer he would deny any holiday plans, but would disappear to turn up a month later, having visited a wondrous place. He would visit his favorite travel office in downtown Montreal to inquire of his favorite agent about the latest and most unusual travel bargains. He frequently arranged trips to visit former residents in other countries, sometimes to operate with them. Once when several of the staff riding in the elevator began to talk about how silent the new British Comet passenger jets must be, from the back of the elevator a voice said, “Well . . . , they do make some noise.” With that Elvidge admitted that his latest trip had been a safari to Africa, planned so he could be one of the first to fly in a Comet from London to Cape Town.

A favorite destination of Elvidge was South America, and at any opportunity he would attend medical meetings there. During one particular meeting in Peru, Cone became worried because Elvidge’s return to Montreal was nearly 1 week overdue. Having been on call much longer than expected, Cone sent a telegram to the last known contact of Elvidge in Lima. A reply was promptly received from a Peruvian physician that read, “Dr. Elvidge on vacation in Andes.” Elvidge had taken a train into the Andes, had become snowed in (most probably to his great delight), and was unable to return to Lima until nearly 1 week later. Notorious for giving incorrect information about his return from trips, Elvidge might state his return as “Tuesday, the 14th.” But Tuesday was not the 14th, and the 14th was not Tuesday. Therefore, Cone and Penfield never knew exactly when Elvidge would show up.

Whether it was about his latest trip on the Oregon Trail, or visiting a former resident in Bombay, his entertaining travel talks to the institute staff, illustrated by his own slides, became legendary. He once prefaced his talk by holding up a small pencil sharpener in the shape of a globe and began, “You know . . . , the world is a very small place.” From one of his trips to Africa he showed a slide that seemed to show a lion right beside him—in reality it had been a (mistaken) double exposure. His consulting office walls were graced by fine paintings of African animals rendered by his artist grandfather, Joseph Smit.

Elvidge retired in 1962, but remained as an honorary consulting neurosurgeon at the MNI. During the years that followed retirement he fought courageously against the relentless incapacitation of Parkinson’s disease. He died at the MNI as a result of complications of the disease on January 17, 1985.

Conclusions

As the third man at the MNI, Arthur Elvidge seemed to be overshadowed by Wilder Penfield and William Cone. This may be because, although blessed with an astute intellect, he was more humble than his colleagues. In addition, Elvidge enjoyed no major administrative base with which to identify his impact on the Institute.

If the legacy of a neurosurgeon can be measured by the impact and longevity of his contributions, Penfield and Cone chose their first hire remarkably well (Fig. 8). Seldom does a person make more than one significant offer-
ing in a scientific career, yet Elvidge made several. Not only did he introduce and routinize the use of angiography to North America, he also promoted angiography as the standard diagnostic procedure for cerebrovascular disease. His work with angiography was decades ahead of its time, largely because he was able to overcome problems associated with toxic contrast media and the lack of suitable mass-produced technology to acquire multiple film plates. His 1935 publication on gliomas was the first to test the classification system proposed by Cushing and Bailey and became a recognized monograph in its own right. He formulated a revised nosology for the tumors of the neuroepithelial group and standardized many definitions and clinical associations, especially for glioblastoma. Outside the field of neurosurgery, Elvidge described the mode of transmission of poliomyelitis, coauthoring two important papers that defined polio as a disease of the central nervous system exclusively.7,8 Those who trained with him, even during the most severe circumstances, remember that he often made the laborious hours somewhat easier to bear. Perhaps summa-

Acknowledgments

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