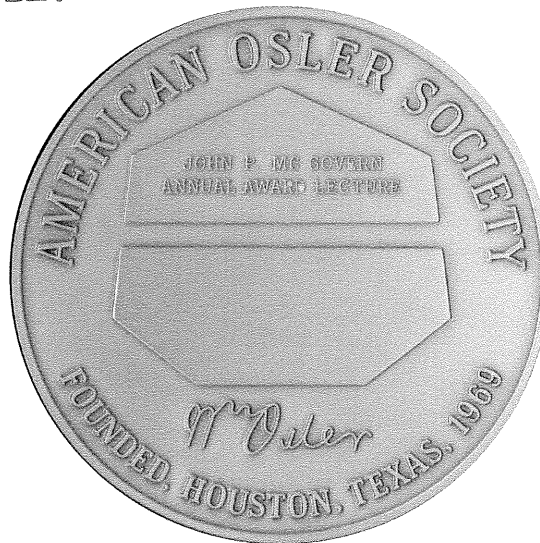


American Osler Society, Inc. John P. McGovern Award Lectureship

**(A) Leg to Stand On:**  
**Sir William Osler & Wilder Penfield's "Neuroethics"**  
**Joseph J. Fins, M.D., F.A.C.P.**



**OSLER  
PAMPHLET**



## John P. McGovern Award Lectureships

1. *Our Lords, The Sick* presented by Albert R. Jonsen, Ph.D., April 12, 1986, in San Francisco, California.
2. *To Humane Medicine: Back Door or Front Door?* presented by Edward J. Huth, M.D., April 29, 1987, in Philadelphia, Pennsylvania.
3. *Medicine and the Comic Spirit* presented by Joanne Trautmann Banks, May 3, 1988, in New Orleans, Louisiana.
4. *The 'Open Arms' Reviving: Can We Rekindle the Osler Flame?* presented by Lord Walton, April 26, 1989, in Birmingham, Alabama.
5. *Rx: Hope* presented by E. A. Vastyan, May 8, 1990 in Baltimore, Maryland.
6. *Osler's Gamble and Ours: The Meanings of Contemporary History* presented by Daniel M. Fox, April 10, 1991, in New Orleans, Louisiana.
7. *From Doctor to Nurse with Love In a Molecular Age* presented by William C. Beck, March 26, 1992, in San Diego, California.
8. *The Heroic Physician In Literature: Can The Tradition Continue?* presented by Anne Hudson Jones, May 12, 1993, in Louisville, Kentucky.
9. *'The Leaven of Science': Osler and Medical Research* presented by David Hamilton, May 10, 1994, in London, England.
10. *A Body of Knowledge: Knowledge of the Body* presented by Sherwin B. Nuland, May 10, 1995, in Pittsburgh, Pennsylvania.
11. *Other People's Bodies: Human Experimentation on the 50th Anniversary of the Nuremberg Code* presented by David J. Rothman, April 25, 1996, in San Francisco, California.
12. *The Coming of Compassion* presented by Roger J. Bulger, April 3, 1997, in Williamsburg, Virginia.
13. *Why We Go Back to Hippocrates* presented by Paul Potter, May 6, 1998, in Toronto, Ontario

Cover — Obverse and reverse sides of John P. McGovern Award Lectureship commemorative medal which is presented to each annual lecturer.



*The Twenty First John P. McGovern Award Lecture*



A Leg to Stand On:  
Sir William Osler and Wilder Penfield's "Neuroethics"



by



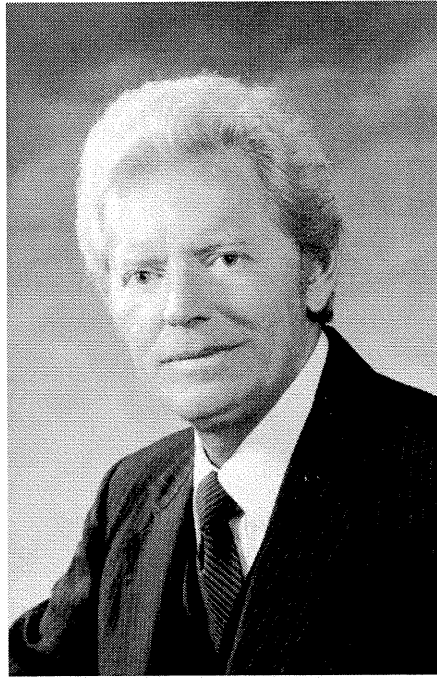
Joseph J. Fins, M.D., F.A.C.P.

Delivered 2 May 2006 Halifax, Nova Scotia  
at the Thirty-Sixth Meeting of the American Osler Society

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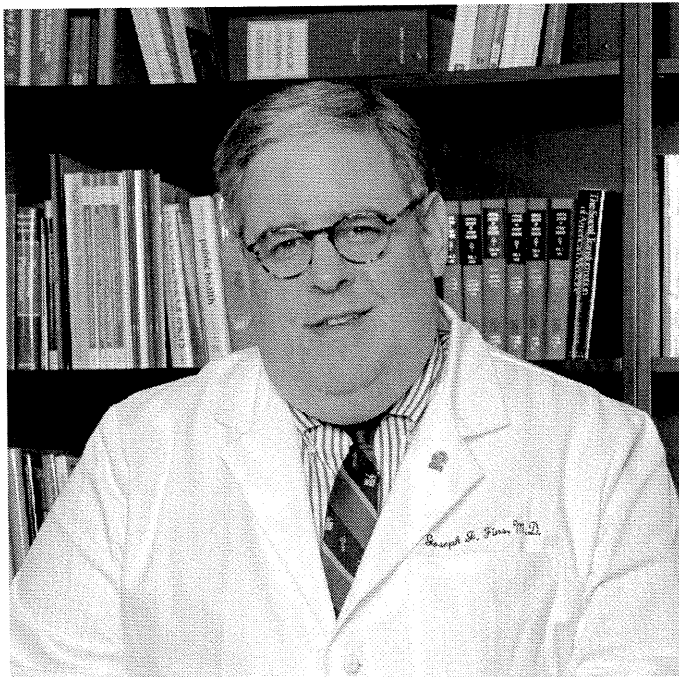


John P. McGovern

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## JOHN P. McGOVERN AWARD LECTURESHIP

Through the generosity of the John P. McGovern Foundation to the American Osler Society, the John P. McGovern Award Lectureship was established in 1986. The lectureship makes possible an annual presentation of a paper dedicated to the general areas of Sir William Osler's interests in the interface between the humanities and the sciences—in particular, medicine, literature, philosophy, and history. The lectureship is awarded to a leader of wide reputation who is selected by a special committee of the Society and is especially significant in that it also stands as a commemoration of Doctor McGovern's own long-standing interest in and contributions to Osleriana.



Joseph J. Fins M.D., F.A.C.P.

Joseph J. Fins is chief of the Division of Medical Ethics in the Departments of Public Health and Medicine at Weill Medical College of Cornell University, where he holds professorships in Medicine, Public Health, and Medicine in Psychiatry. He also serves as director of Medical Ethics at New York-Presbyterian Weill Cornell Medical Center, associate for Medicine at The Hastings Center, and Physician-Ethicist-in-Residence at the HealthCare Chaplaincy in New York City. He is a recipient of a Soros Open Society Institute Project on Death in America Faculty Scholars Award and a Woodrow Wilson Foundation Visiting Professorship. His publications include more than 100 peer-reviewed articles on a wide range of topics pertaining to medical ethics, such as allocation of health care resources, health care reform, economics and medicine, managed care, end-of-life decisions, palliative care, futility, advance directives, the doctor-patient relationship, postgraduate medical education, physician assisted suicide, brain death, ecosystem health, medical ethics in a pluralistic society, regenerative medicine, and clinical pragmatism as a method of moral problem solving for medicine. He is most recently the author of *A Palliative Ethics of Care: Clinical Wisdom at Life's End* (Jones and Bartlett, 2006).



*If ever I summon before me my highest ideals of men and medicine, I find them sprung from the spirit of Osler.*

—Wilder Penfield, M.D.

Neuroethics is a recently coined phrase that is shaping our cultural understanding of advances in neuroscience. Cautionary in tone, neuroethics has taken hold in the bioethics community, in large part, because of its putative novelty.

In this lecture, I will consider what the rise of neuroethics means for our ethical deliberations about advances in neurology and neuroscience and ask whether or not neuroethics is novel and distinct from more conventional sorts of ethical inquiry in medicine and research. To do this I will turn to the history of medicine, and in particular, the historical legacy of Sir William Osler on Wilder Penfield. Penfield was the neurosurgeon and neuroscientist who founded the Montreal Neurological Institute whose trainees formed the core of the National Institute of Neurological Diseases and Blindness in the early 1950's.<sup>1</sup> Penfield's pioneering work on consciousness, the mapping of the brain and the treatment of epilepsy bear directly upon the concerns addressed today by neuroethics.

### **Neuroscience and Neuroethics**

The advent of neuroethics as something distinct from more conventional medical ethics comes at a time of breathtaking advances in neuroscience. In the realm of disorders of



consciousness, that range of maladies from stupor and coma to the vegetative and minimally conscious state, neuroscientists are discerning mechanisms of recovery and refining diagnostic categories. Neuroimaging techniques like functional MRI and PET, coupled with electrophysiologic techniques, have allowed the realization of Osler's observation in "The Leaven of Science" that, "The determination of structure with a view to the discovery of function has been the foundation of progress."<sup>2</sup>

Progress has been made in categorizing these complex brain states. We now know that patients can regain some evidence of consciousness before the vegetative state becomes permanent.<sup>3</sup> In the window between the persistent and permanent vegetative states, patients can progress to what has recently been described as the *minimally conscious state* (MCS).<sup>4</sup>

Unlike vegetative patients, the minimally conscious demonstrate unequivocal, but fluctuating, evidence of awareness of self and the environment. Assessment of MCS patients, however, is complicated by the fact that these MCS behaviors are episodic and inconsistent, so when patients are not exhibiting them, they may be mistaken as being in the vegetative state. The episodic and intermittent nature of these behaviours make diagnosis difficult and these patients are easily confused—and sometimes polemically conflated—with vegetative ones.<sup>5,6</sup> Unlike vegetative patients who have reflexive eye movements, so famously captured on the edited videotape where Terri Schiavo *seemed* to look at her mother,<sup>7</sup> MCS patients may purposefully and intentionally track objects in their visual field.

Distinguishing the minimally conscious patient from the vegetative one is critical because the MCS patient is conscious and has the potential for longitudinal recovery. They may have "a life of the mind": they may say words or phras-

es and gesture. They also may show evidence of memory, attention and intention.<sup>8</sup> Patients are considered to have *emerged* from MCS when they can reliably and consistently communicate. This can occur years and, rarely even, decades after the patient becomes minimally conscious,<sup>9</sup> creating a host of ethical dilemmas for families and clinicians.<sup>10</sup>

The most notable example of emergence to consciousness is the case of Terry Wallis, a 39-year-old Arkansan nursing home patient who had carried the "vegetative" diagnosis for 19 years following traumatic brain injury in 1984. He began to speak in the summer of 2003.<sup>11</sup> Since then he has continued to improve, laying down new memories, regaining cognitive function and motor skills.<sup>12-14</sup> Neuroimaging studies by my colleagues at Cornell have found suggestive evidence of what may reflect remodeling of structural connections within Mr. Wallis' brain, raising the possibility of regrowth of axonal connection among neurons.<sup>15</sup> Linking this empirical observation to a neural correlate of the recovery of consciousness is more difficult. Nonetheless, these observations complement recent evidence that axonal regrowth may occur following structural brain injuries in adult primates and that this process has a molecular basis. Taken together these studies open the door to the possibility that a naturally-occurring process might be prompted, or accelerated, through therapeutic engagement.<sup>16-18</sup>

### **The Challenge of Neuroethics**

It is against this backdrop, of clinical possibility and scientific discovery, that neuroethics emerges. Neuroethics has been described by William Safire as the "examination of what is right and wrong, good and bad about the treatment of, perfection of, or unwelcome invasion of and worrisome manipulation of the human brain."<sup>19-21</sup> Safire's concerns are not limited to the "perils" of research and enhancement but even

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noted in the context of treatment.

Neuroethics is a prudential, if not wary ethic, warning of threats to personal identity and introducing rather strange and cyborgish concerns about the self and how technologies, like neuroimaging or neuroprostheses threaten “neural integrity” and portend a post-human future with all the perils of cognitive enhancement.<sup>22-24</sup>

In my view, all of this is a bit of overstatement. It comes at the cost of therapeutic engagement of patients who have heretofore been marginalized and sequestered from the fruits of neuroscience and the possibility of therapeutics.<sup>25</sup> If we take the domain of neuroimaging, a favorite topic of neuroethicists,<sup>26</sup> as an example, hyperbole has outstripped scientific reality. Despite all the futuristic warnings, imaging studies can tell us very little about disorders of consciousness. We can not identify thoughts, much less definitively distinguish the minimally conscious state from the vegetative one. And yet, when these technologies are invested with capabilities they do not possess, critics undermine the possibility that they will be used for legitimate and worthy purposes.<sup>27</sup>

The reasons for this are complex, but are explained, in part by the fact that neuroethics has developed as a speculative philosophy, rather than one grounded in clinical reality. It is neither therapeutically engaged, nor directed towards the needs of patients afflicted by neuro-psychiatric disorders. We see this explicitly in the view of Michael Gazzaniga whose definition of neuroethics excludes a consideration of “medical cure.” Instead, he views neuroethics as “spin-off of bioethics” that has the capability of making far more expansive social claims. Gazzaniga writes that:

... I would define neuroethics as the examination of how we want to deal with social issues of disease, normality, morality, lifestyle and the philosophy of living

*informed by our understanding of underlying brain mechanisms.* It is not a discipline that seeks resources for medical cure, but one that places personal responsibility in the broadest social and biological context. It is — or should be — an effort to come up with a brain-based philosophy of life.<sup>28</sup>

Notwithstanding that philosophy has almost certainly been “brain-based” since Plato and Aristotle, and most certainly since Descartes, Gazzaniga’s expansive stance is worrisome. Ascribing to neuroscience the possibility of what he describes as the articulation of a brain-based “universal ethics” is eerily reminiscent of a theological construct favoring natural law.<sup>29</sup> Despite appearing scientifically based, it sounds too prescriptive with its claim to universality limiting other legitimate ways of knowing and reaching ethical judgments.

Gazzaniga’s call for a universal ethics is also reminiscent of Jose Maria Delgado’s idea of using implantable brain implants to *psychocivilize society*.<sup>30,31</sup> Delgado, a physiologist working at Yale, studied aggression in primates and then manipulated their response through the use of implantable electrodes. He asserted that, “a better understanding of the neurophysiological mechanisms responsible for aggressive and destructive reactions may provide man with greater capacity to educate and direct his own behavior.”<sup>32</sup> The Spaniard came to international attention in 1965 when he stopped a charging bull in Cordoba’s bullring using a “stimociever” he had developed.<sup>33</sup>

Delgado asserted that civilization was about to embark on a new epoch during which the human mind could influence its own evolution through the use of technology. He wrote elegiacly of a new sort of self-determination that would allow humans to escape the capriciousness of normal

evolution in tandem with technology, achieving a "... future man with greater personal freedom and originality, a member of a psychocivilized society, happier, less destructive, and better balanced than present man."<sup>34</sup>

Safire's fears about the "unwelcome invasion of and worrisome manipulation of the human brain" coupled with the historical backdrop of Delgado's sweeping theories and Gazzaniga's current call for a "universal" "brain-based" ethics coalesce into a "neuroethics" that is wary about breaching the blood brain barrier. The message is clear: Engaging the needs of patients with disabling neuropsychiatric disorders is something to be done at one's own peril. Work in this area will only lead to recriminations and controversy.

### **An Alternative Neuroethic of Care**

While neuroethics, as currently conceived, raises interesting theoretical concerns about the nature of human nature, it has ill-served the pragmatic call of the clinic. This is not unexpected because most of the commentators in this nascent field have been ethicists and philosophers, and not physicians.<sup>35</sup> Such a theoretical orientation is reminiscent of the early history of bioethics, itself, when the field was focused on abstract principles, and populated by the philosophers and theologians who espoused them. David Rothman has called them "strangers at the bedside."<sup>36,37</sup>

Like many other clinicians, when I was first exposed to this mode of ethical reasoning I found it somewhat wanting. Who could be against the four principles of bioethics, autonomy, beneficence, non-maleficence and justice? The real question was how does one decide between principles when they are in conflict and articulate a process that takes account of clinical nuance, the specifics of the case, and the interactions of all involved? In response to these questions, my col-

leagues and I developed a method of moral problem solving, which we called *clinical pragmatism* drawing upon the American Pragmatic tradition and the writings of John Dewey in particular.<sup>38</sup> The basic idea is that there is a relationship between ethical theory and clinical practice, with one informing the other in the service of determining a reasonable course of action.<sup>39,40</sup>

I digress into the autobiographical because my initial thoughts about neuroethics reminded me of my initial reaction to principle-based bioethics. It also directed me towards the clinic and ultimately the history of medicine to see whether I could find an alternative — and perhaps earlier — formulation of neuroethics. In the work, life and legacy of Wilder Penfield I found an alternative formulation that was experiential as well as theoretical and which advanced, rather than feared, incremental therapeutic engagement. Penfield's contributions to neurodiagnostics, as a neurologist and neuropathologist, and therapeutics, as a neurosurgeon and neuroscientist, embodies a rich ethical sensibility. Though it was never designated as neuroethics, *per se*, Penfield's writings are especially relevant to ethical deliberations about neuroimaging and neuromodulation, especially as they relate to consciousness, because his own work anticipated, and inspired, many current developments.<sup>41-44</sup>

### **Penfield's Osler**

Let us turn to the broad outline of Penfield's life. He was born in 1891 in Spokane, Washington, the son of a failed and reclusive physician-father and a strong-willed and proud educator mother. When she took the kids to Wisconsin as a single parent, she founded a special school so that a proper education would be given. He was educated at Princeton and went to Oxford as a Rhodes Scholar, something that his mother had dreamt of since he was a teen.

After studying medicine at Oxford, and being tutored by Osler, he was directed to Hopkins for medical school. He graduated in 1918 and interned at the Peter Bent Brigham Hospital under Cushing. He completed his residency at the old Columbia Presbyterian Hospital on New York's Upper East Side and began his career there until moving to Montreal in 1928.

Penfield's choice of medicine as his life's work came after a long rejection of medicine as a field. His career was graced with a long-line of patriarchal figures who can perhaps be seen as surrogates for his own absent physician-father. The greatest names in medicine passed through his life: Osler, Halsted, Whipple and the Nobel Laureates Sherrington in Queens Square and Ramon y Cajal in Madrid. And if this was not enough there is Harvey Cushing, who called Penfield his "senior pupil"<sup>45</sup> with whom he had a more complicated relationship, almost a sibling rivalry with a much older brother—two heirs of the Oslerian legacy.

But of all these relationships, the one with Osler was the most influential and formative. At a dinner in Montreal in 1971, Penfield sought to capture Osler's influence on him with the touching tale of a young man seeking guidance for a life time. He asked his audience how he could make them:

... see and hear him saying goodbye to an anxious student, opening the door for the young man, reassuring him with a few words, approving the plan he has made for a life time, and sending him off on his bicycle through the rain with renewed courage and the warm awareness that he has a friend?<sup>46</sup>

Wilder Penfield first met Sir William Osler in 1915 when the Regius Professor of Medicine greeted the young Rhodes Scholar to Oxford. Osler was 65 and Penfield 23, having just

arrived from undergraduate work at Princeton. Penfield later convalesced with the Oslers at 13 Norham Gardens — "The Open Arms" — in 1916 when the S.S. *Sussex* taking him across the Channel to do aid work in France was torpedoed. He broke his leg and was, as Bliss notes, "taken into the family to recuperate."<sup>47</sup> Penfield reminisced that, "it was a time when their much-beloved only child, Revere, was home on leave from fighting in France, and I was, for the moment made a member of a never-to-be-forgotten family."<sup>48</sup>

In an address to the Osler Society, University of Western Ontario in 1941, Penfield tells of the concern the Oslers had for the wounded American. While still in a military hospital in Dover, he wrote his mother:

... My! Everyone is nice. Both Sir William and Lady Osler and their cousin have written and Sir William telephoned.

[April] Received my first bunch of flowers. The first ever. They came from Lady Osler. I can hardly understand all their kind attention. A letter came from him yesterday to tell me about the surgeon who is in charge of me, Mr. Linington. He says he seems to be a good man, to judge from his directories, and he remembered an article by Linington in the *Lancet* and told me to ask the latter about it. So I did, and he seemed quite pleased and brought it for me to read. This morning, Mr. Linington said he had heard directly from Sir William.<sup>49</sup>

Penfield's Oxford experience was formative. Osler became an ego ideal. Again quoting from a letter home, Penfield spoke of Osler's ethical sensibility: "he sees good and something to admire in everyone."<sup>50</sup> He also spoke of his



desire to emulate him:

He (Osler) said, at the end, that *his rule had been to like and sympathize with everyone*. That's his creed, I think. He is the least sentimental and the most helpful man I've ever seen — the most lovable. You may believe that he is stimulating to me, too, and is on something of a pedestal. If I were not so dumb, I should have the nerve to hope and dream I might follow in his footsteps.<sup>51</sup>

And he did. Like, Osler who pursued pathology before internal medicine, Penfield became a neuropathologist before becoming a neurologist and neurosurgeon. His career trajectory reflected Osler's own preparatory work in the laboratory medicine and its utilization in subsequent diagnostic efforts.

And is well appreciated here, it could be argued that Osler himself was a neurologist/neuropathologist having authored about 200 articles on general neurology out of a total of 1400 publications.<sup>52</sup> In his work in neurology and everything else Osler modeled an inductive and discriminating approach. Not one for broad unsubstantiated claims, the details mattered. This was exemplified in an 1881 article in which Osler debunks a theory by Moriz Benedikt that the fissures and gyri of criminal brains were somehow different than normals.<sup>53</sup> In an example of careful methodology, that should not be lost on today's generation of neuroimagers, Osler examined the brains of 4 criminals and compared them to 31 controls without a criminal background and found that there were no differences.<sup>54</sup>

Penfield's habits as a pathologist were formed at Osler's side, although his initial efforts did not portend great success. Recalling his first failed effort, Penfield captures Osler's

patience and ability to encourage the novice and inculcate good habits:

Although he gave us no formal lectures, Sir William made possible many contacts with the medical students. One morning, he watched me for a few minutes trying to perform my first autopsy. "Splendid! Splendid!" he exclaimed at last. "It is always better to do a thing wrong the first time." Whereupon, he took up my instruments and showed me how to do it correctly.<sup>55</sup>

The lessons stuck with Penfield late in life recalling what he had learned at Osler's side:

In the autopsy room at Oxford, Sir William Osler taught me how to remove the brain. At the same time, he made me realize that a post-mortem examination is admirable, a splendid thing in which the physician takes pride. It brings always the hope that this patient did not die in vain...<sup>56</sup>

This neuro-pathologist who Osler trained, had the last word, as it were, when the Montreal Neurologic Institute made a neuropathological examination of Osler's brain in 1959 when it was loaned to MNI from the Wistar Institute in Philadelphia.<sup>57</sup>

The same curiosity that motivated their mutual interest in pathology also fueled Penfield's quest for scientific discovery. Hoff has observed that Osler "...touched Penfield at a critical time in his early professional life, strengthening his commitment to a life of innovation and investigation."<sup>58</sup> This influence comes across in a celebratory essay for *The McGill News* that he authored on the Centenary of Osler's birth.

Asking what made Osler unique among doctors, Penfield stressed Sir William's uncompromising need to know and understand the cause of things. In a mock prescription he wrote out the ingredients needed for an "ordinary doctor" and what else made Osler special. If an average doctor needs:

Rx

One part—compassion for human suffering;  
One part—curiosity about the body and mind of man;  
Two parts—willingness to work  
Dissolve in a decade of time and decant!<sup>59</sup>

He continued:

If that makes an ordinary doctor, then how was Osler different? One difference was that from the outset he was consumed by desire to discover the cause of things.<sup>60</sup>

Beyond his training in pathology, I would assert that Penfield also gleaned an ethical sensibility from Osler. The importance of Osler on Penfield is captured in his assertion that, "If ever I summon before me my highest ideals of men and medicine, I find them sprung from the spirit of Osler."<sup>61</sup> But what was it that sprung from Osler?

Osler's pronouncements on ethics were rare. According to Bliss —his most recent biographer: "Osler's statements on scientific ethics are so few because he was usually in the company of physicians who did not need to discuss them."<sup>62</sup> Yet there are clues, at suggesting how Osler's ethical sensibilities influenced Penfield. We have already heard how Penfield reported that Osler's "*rule had been to like and sympathize with everyone.*" This was a call for clinical engagement and benef-

icence in the service of others. And yet it was a measured and incremental response, growing out of Osler's own careful and deliberate approach to medical practice, a practice that was responsive yet responsibly cautious because it was founded on a growing body of empiricism and broad training.

Feindel—whose scholarly work is cited throughout this paper with gratitude—points to this Oslerian imprint on the development of “medico-chirurgical neurology.” He observed that:

Osler's liberal attitude toward brain surgery stemmed from his awareness of the focal nature of some intracranial lesions examined in his pathological studies. His published reports and editorial comments informed his medial contemporaries about the exciting advances in this young surgical specialty. In a more personal sense, Osler's spirited humanism influenced the future of neurosurgery through his friendships with Cushing and Penfield, who both warmly declared their intellectual and inspirational debt to him.<sup>63</sup>

But Osler's endorsement of medical advance is not without limits as we see in a remarkable statement on research ethics reported in Bliss's magisterial biography. In “The Evolution of the Idea of Experiment in Medicine” presented to the Congress of American Physicians and Surgeons in 1907, Osler delineates the parameters within which human subjects research might be permitted:

The limits of justifiable experimentation upon our fellow creatures are well and clearly defined. The final test of every new procedure, medical or surgical, must be made on man, but never before it has been tried on

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animals... For man absolute safety and full consent are the conditions which make such tests allowable. We have no right to use patients entrusted to our care for the purpose of experimentation unless direct benefit of the individual is likely to follow. Once this limit is transgressed, the sacred cord which binds physician and patient snaps instantly. Risk to the individual may be taken with his consent and full knowledge of the circumstances...Enthusiasm for science has, in a few instances, led to regrettable transgressions of the rule."<sup>64</sup>

Anticipating much of what would follow in research ethics, — Osler articulated a remarkable doctrine for human subjects research. Forty years before the Nuremberg Code<sup>65</sup> and nearly seventy before the Belmont Report,<sup>66</sup> he dictates that the purpose of research is clear, informed consent is secured and that antecedent studies are preformed in animal models. Most critical, though, is the requirement that the experimentation harbours the possibility of "direct benefit," for without that "the sacred cord which bind physician and patient snaps instantly."

### Penfield's Ethics

Penfield was bound by a similar Oslerian ethic: An enduring commitment to the patient and to the creation of new knowledge in the service of future patients. We see Penfield striking this balance in his poignant re-telling of the diagnostic dilemma posed by a young patient with a brain tumor.<sup>67</sup>

The year was 1921 and Penfield had just come to the Presbyterian Hospital in New York from his internship with Cushing to become a surgical associate of Allen Whipple. The first patient admitted to his care was Federico, an Italian

boy of ten who was rapidly losing vision from a tumor. Penfield asked for a neurology consult and was curtly informed by Frederick Tilney, Professor of Neurology, that, "No operation was to be carried out." It was a categorical judgment for a hopeless situation, and one in which the neurologist knew best. Penfield sought to appeal the judgment and Tilney would not budge. Penfield thought him rude.

Out of options he went to Allen Whipple his chief and found himself in the midst of a political battle concerning the placement of the neurology service at either the Presbyterian Hospital or the New York Neurological Institute (stocked with their own surgeons.) Faced with this additional concern, Whipple urged that Penfield wait for the Dean to return from a trip to settle things. He told Penfield, "... unless there is a real chance to cure the boy or to save his life, please don't push the issue too quickly."<sup>68</sup>

Most would have stopped there—but Penfield needed to know more, to make a sound and proportionate judgment. So—and here is an echo for neuroethics and current deliberations about neuroimaging—so, Penfield sought refuge in a new technology, that might provide more information.

About that time, the neurosurgeon Walter Dandy of Johns Hopkins, had just developed the ventriculogram. Penfield thought it might be useful in determining whether his patient was an operative candidate. But like many of today's neuroimaging techniques, the ventriculogram was controversial, not because it read one's soul, but because it was felt to be dangerous. Cushing and Charles Elsberg—chief of neurosurgery at New York Neurological Institute both opposed it.

Cushing, who had been seeking to professionalize neurosurgery, establish residency training, and set standards and norms for this subspecialty criticized the use of the ventriculogram and Dandy, his former assistant at Hopkins, who

incidentally had spurned an offer to join his chief in Boston. According to Rosa Lynn Pinkus, who has studied medical error and the rise of professionalism through the prism of the early history of modern neurosurgery, Cushing's legendary attacks on Dandy were over what "constituted 'safe' practice" and about integrity. At the 1922 meeting of the Society of Neurological Surgeons, Cushing publicly rebuked Dandy for introducing the technique to those who might not be adequately prepared to use it and for neglecting to report three early deaths from the procedure.<sup>69</sup>

Bliss shares more details of the confrontation between Cushing and Dandy. Although Cushing admitted that if ventriculography worked in even a small number of cases, "we must accept the procedure as a very important contribution" he was far from convinced that this technology should go forward. He also questioned whether Dandy had faithfully reported the true risks and benefits of the procedure:

I wish Dr. Dandy would state specifically the number of tumor cases he has investigated in this manner. I believe that he has tended to be overenthusiastic about the procedure and to belittle the risks... In Dr. Dandy's enthusiasm, he has led many to believe that a shortcut to localization of brain tumors has been discovered and that all such patients be subjected to it. I may be unduly conservative, but I have grave doubts of this. If the procedure has been so successful in Dr. Dandy's hands, it is incumbent on him, for the sake of others, to be less general and more specific.<sup>70</sup>

Penfield was undoubtedly aware of this tension but felt—as he ironically conveyed in his *Cushing* Oration of 1971—that ventriculography "was a great step forward, welcomed eagerly by those of us who were younger than he (Dandy)

but frowned upon by other more senior surgeons (Cushing among them). Dandy put the final diagnosis of brain tumors into the hands of the neurosurgeon and freed him from the neurological patronage that Horsley had been forced to accept."<sup>71</sup>

So a year before Cushing and Dandy's public confrontation, Penfield went to Hopkins to learn the procedure. He returned to New York and did it safely on the boy. He vowed, "I decided then to continue to use Dandy's method of ventriculography, regardless of the disapproval of elder clinicians."<sup>72</sup>

Unfortunately the ventriculogram demonstrated that Tilney was indeed correct. He was not going to be able to save the child: the tumor was indeed inoperable. Penfield lamented, "I could not be sure of saving the boy, and it seemed kinder and wiser not to try." He told the parents with great compassion: "I am afraid your little boy is going to die...But I may be wrong. Doctors *are* wrong sometimes, you know."<sup>73</sup> Sadly, he was right and the little boy died. He recalled his own heartache: "I remembered how he had looked at me with his appealing dark eyes when I realized that vision in them was a light about to fail. Some pictures one never forgets."<sup>74</sup>

Federico died a couple weeks later and that insistent curiosity Penfield inherited from Osler tugged at him again. He had to know if he might have been able to save the child. He went downtown to the tenement where the family lived and got permission to do a post-mortem examination. The autopsy confirmed the anatomy seen on the shadowy ventriculogram but raised new questions about histology. Again in the spirit of Osler's quest for knowledge, these unanswered questions would lead Penfield to Madrid to learn Ramon y Cajal's silver staining methods from his master cytologist, Pio del Rio-Hortega.<sup>75</sup> This, in turn would lead to



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his pioneering work on oligodendrocytes, brain scar tissue and the epilepsy, which often formed in its wake.

Returning to the case of young Federico, we see echoes of Osler's ethical sensibility in Penfield's actions. We see a practitioner committed to his patient's welfare and courageous advocacy, if you consider that his use of the ventriculogram challenged his local superiors and the received wisdom of elders like Cushing. Yet, despite his convictions, Penfield pursued his diagnosis in a truly incremental fashion. He did not rush to operate but sought additional information from a less invasive, albeit novel and as yet not fully vetted technology. His judgment was an ethically proportionate one because the ventriculogram was less risky than surgery and no surgery could be contemplated unless a more favorable anatomy could be demonstrated. Penfield made an independent assessment of the technology and was adventurous in its diagnostic application, but knew where to draw the line and pursue a palliative course of care.

This streak of independent thinking, here limited to the use of the ventriculogram, and leap-frogging figures he respected like Cushing, foreshadowed the greater advances he would make in the field, often confronting conventional or accepted wisdom. Bliss describes Dandy and Penfield as Cushing might have considered them, as "the radical young surgeons."<sup>76</sup> Notwithstanding that designation, Penfield, as distinguished perhaps from Dandy, pushed the envelope with due deference and respect to what had been established. For example, he once reported to John Fulton — Cushing's biographer and neurophysiologist of Yale, linked to the story of lobotomy — of both the enormous debt he owed Cushing and his willingness to improve upon his masterful technique:

...no one has ever excelled Cushing in fastidious care and devotion to detail. It seems fair to say, therefore,

that throughout my surgical career I have used Cushing's method as a sort of classic and have constantly referred to the general principles while he laid down in neurosurgical operating. We have departed from his procedures in a manner that I believe he would have approved. In my opinion he would never have adhered to his own ritual as slavishly as some pupils might.<sup>77</sup>

This was not disrespect but the continuation of an historic legacy, an embellishment that departed from received wisdom and was itself a legacy of Osler and reminiscent of Cushing himself. Again, the image of two siblings come to mind, with Cushing the much older brother, or perhaps the paternal proxy for his beloved Osler. Writing a eulogy for the Harvey Cushing Memorial Meeting of the Montreal Neurological Society in November of 1939, Penfield reflected that:

It was easier for me to see in Cushing the imprint of his masters because of the fact that I was a medical student under Osler at Oxford and under Halsted at Hopkins. It is a common experience for all of us to see in a son an unexpected trick of manner or attitude the recalls his father. In similar way, to see Cushing walk down the corridor of a hospital was sometimes for me to see Osler in the same attitude — and to hear his banter...<sup>78</sup>

Years later, Penfield reminisced about an encounter with Cushing during the First International Neurological Congress held in Berne, Switzerland in September 1931. Cushing hosted a private dinner for those who had worked with him at the Brigham. Also present were elders like

William H. Welch founder of Hopkins and Sherrington the Nobel Laureate. Cushing who arranged the place cards, put Penfield at the head of the table:

...Saying I was the oldest living representative, he placed me at the end of the table opposite him. Cushing is the most unexpected man I know. He either snubs me or he envelopes me, but what a dynamic force he is.<sup>79</sup>

Indeed, Penfield was his opposite number. Some have drawn a parallel to Penfield's pioneering work operating on epilepsy and his neurosurgical excursion into that daunting territory to Cushing's tackling of tumor resection a generation earlier. As Preul and Feindel put it, "Both began their work when many physicians had serious reservations regarding the therapeutic benefit of definitive surgery."<sup>80</sup>

Such innovation amidst a deference to tradition, however, came with an historic sensibility that the antiquarians Osler, Cushing and Penfield all shared. Each loved books and libraries and their stories are linked in the historical libraries we cherish today. It is well known that Cushing donated his considerable library to Yale —after the dedication of the Osler library at McGill. Penfield was an honorary librarian and one of the curators of the Osler Library. Indeed he was the one entrusted to release what Osler had called the "secret history" of the Johns Hopkins Hospital with the revelations about Halsted's addiction.<sup>81</sup>

That reverence for books also reflected an awareness that one has a place in history and that one needs to collaborate with others — and build institutions — in order to leave an historic legacy. On more than one occasion Penfield wrote about Victor Horsley, the neurosurgeon at Queens Square in London who founded the field in 1886, but left no disciples.

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In contrast to Cushing who built a service and left disciples and a speciality, Horsley —“the most distinguished pioneer neurosurgeon, had died in 1916 without having established a school of neurosurgery.”<sup>82</sup> And to Penfield the historian, this meant that Horsley had lost his chance to influence history.

Of course Penfield did just the opposite. And here is another Oslerian legacy. Like Sir William at Hopkins, and Cushing at The Brigham, Penfield was an institution builder. The title of his valedictory memoir, *No Man Alone*, embodied the philosophy that led to the visionary founding of the Montreal Neurologic Institute in 1934. This man who was trained as a neurologist, neurophysiologist, neuropathologist and neurosurgeon— brought all these disciplines together under one roof, to minimize the schisms that impede learning and patient care. It was a deliberate exercise of bringing together people in order to create synergisms through, as the Rockefeller philanthropist Alan Gregg put it, the “contagious companionship of excellence.”<sup>83</sup>

Penfield’s organizational ethic was a deliberate one, of putting together the pieces in a careful and reflective way. Indeed, reading his memoirs one gets the sense that there was ever more for him to learn before he acted. He was like a coiled spring, waiting to pop and advance. But it was a calculated and not impulsive series of moves. It was also progress devoid of hubris and an evolution appreciative of his debt to his teachers. Worried about whether he could build the MNI, Penfield reflected:

Sherrington had pointed the way toward the unexplored place of understanding when I entered medicine. I had done many things since then. I had learned the methods of his friend Ramon y Cajal and applied them to human anatomy and pathology. Now I was ready to begin a new approach in which I hoped to

become a physiologist studying the brain of man. Could I, at forty, *gather together a group* (italics added) that would make a worthwhile physiological approach to the working of the brain while carrying on routine neurosurgery for the relief of pain and the removal of tumors and treating focal epilepsy by radical excision?...<sup>84</sup>

On another occasion while conceptualizing his institute and traveling in Germany in 1928, he observed that, "When one is alone, it is easy to go off on a tangent."<sup>85</sup> It was important for Penfield to innovate but still be mainstream. This need to push forward in a balanced and deliberate way becomes all the more obvious if we contrast it with his assessment of the approach of his contemporaries Freeman and Watts, who were developing psychosurgery.

On the one hand, he was intrigued by their work because of his own interest in the frontal lobes and outcomes following large resections followed with his colleague Hebb.<sup>86</sup> But he was also cautious about side-effects in a way that would, perhaps, been only apparent to someone with his broad training and wide range of colleagues. Drawing upon his surgical work on epilepsy and his experience as a neuropathologist, he was early to point out a seizure risk. Pressman notes that Penfield "astutely observed that the leucotome method left in place damaged brain tissue that might eventually lead to epileptic seizures." This observation was made as early as a 1937 just two years after Egas Moniz began this work.<sup>87, 88</sup>

Five years later he was more accepting of psychosurgery, although he viewed it as a means to deeper understanding and evolving treatments, not the summation of neuroscience. This point is subtly made in a congratulatory note to Freeman and Watts in 1942 on the publication of their

*Psychosurgery:*

It is beautifully and thoughtfully done. It will prove to be the building stone in a structure of therapy in a field where little therapy has stood the test of time.<sup>89</sup>

Note the wording: psychosurgery is a building stone, a single stone, in a larger structure of a field devoid of therapy. It is not the end of progress but the beginning of what today is just taking root under the guise of neuromodulation.

In contrast to the zealotry, which marked the sad story of psychosurgery,<sup>90</sup> Penfield engaged in both responsive and responsible research, in keeping with the Oslerian tradition, of which he is an important part. He was an incremental innovator, with an ethic of humility, who sought the approval of his colleagues. He was also aware of precedent. Again, from the Cushing Oration of 1971:

We have learned to cross the body-to-brain frontier, with safety for the patient, bringing him relief and sometimes cure. The door has opened wide, and yet I suspect that the past is no more than a prelude to understanding.<sup>91</sup>

This historic sensibility gave Penfield a sense of when to move forward and when to hold fast. This is *a sound neuroethic*, from the past for today, even if Penfield did not call it such.

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- <sup>41</sup> My colleague Dr. Nicholas D. Schiff, who has done pioneering studies in disorders of consciousness, acknowledges his debt to Penfield's work and William Feindel's hospitality during a formative visit to the MNI, the Penfield Collection and the Osler Library while still an undergraduate at Stanford in 1986. My collaboration with Schiff later directed me to the life of Penfield.

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## John P. McGovern Award Lectureships

14. *Health Care in the Next Millennium* presented by John D. Stobo, M.D., May 5, 1999, in Montreal, Canada.
15. *"Writ Large": Medical History, Medical Anthropology, and Medicine and Literature* presented by Gert H. Brieger, M.D., PH.D., May 17, 2000, in Bethesda, Maryland.
16. *Reflections on American Medical Education* presented by Kenneth M. Ludmerer, M.D., April 18, 2001 in Charleston, South Carolina.
17. *John Shaw Billings as a Historian* presented by James H. Cassedy, Ph.D., April 24, 2002 in Kansas City, Kansas.
18. *The Evolution of The Controlled Trial* presented by Sir Richard Doll, May 23, 2003 in Edinburgh, Scotland.
19. *Practising on Principles: Medical Textbooks in 19th Century Britain* presented by W.F. Bynum, MD, PhD, FRCP, April 20, 2004 in Houston, Texas.
20. *Just Call Us Children: The impact of tsunamis, AIDS and conflict on children* presented by Karen Hein, MD, April 2005 in Pasadena, California.
21. *A Leg to Stand On: Sir William Osler & Wilder Penfield's Neuroethics* presented by Joseph J. Fins M.D., F.A.C.P., May 2, 2006 in Halifax, Nova Scotia.