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January 2005

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## Recommended Citation

Shafqat, S. (2005). The long shadow of cerebral localization. *Journal of the Royal Society of Medicine*, 98(12), 549.

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## The long shadow of cerebral localization

Saad Shafqat

*J R Soc Med* 2005;98:549

In 1995, during my first week as a neurology resident at Massachusetts General Hospital, I had the privilege of meeting the late Raymond Adams. He was an established octogenarian by then, but the years had made no difference to his air of professionalism and academic authority. His reputation was made in the 1950s and 1960s, when he developed Boston as a major centre of clinical neurology. Among other things, he is immortalized through a famous textbook that has appeared in multiple editions.

Our meeting took place at a clinical conference in which I was required to present a case. He was a demanding clinician, and my neurological examination did not meet his standards of thoroughness. Despite my best efforts, I could not remove the look of displeasure from his face. I defended myself, invoking time efficiency and what not, but Dr Adams was unforgiving. 'You can't rush a neurological examination,' he said. 'A proper one takes three days.'

Dr Adams was, of course, echoing a mindset that goes back to the very foundations of neurology. In 1875, Jean-Martin Charcot had delivered a series of lectures to the Paris Medical School on cerebral localization, laying out a method that sought clinical alliance between pathological cerebral lesions and clinical signs in living patients. He was already much more than a professor by then, his profile and personality was compared to Napoleon and Caesar. He was also well into a legendary career at the Salpêtrière Hospital that would enshrine him as the father of neurology.

The method of cerebral lesion localization became the founding pillar of neurology as a clinical discipline. It is a powerful diagnostic tool that permits reasonably accurate spatial localization of a lesion within the nervous system without resort to technology. The benefits are obvious. The problem, unfortunately, is that lesion localization became an end in itself.

It is the element of theatre. A well-conducted localization exercise enables a formidable display of clinicoanatomic mental gymnastics that can leave impressionable medical students and trainees gasping. In no other specialty are clinical examinations performed in front of large audiences. They are called 'demonstrations', but to an external observer they have all the elements of a freak show. It is also a very visible activity that creates an impression that its practitioners are involved in very busy and important work. Burdened by these distractions, the line connecting lesion localization to patient therapeutics and functional outcomes became obscured.

Admittedly, the deck was always stacked against neurologists. The brain is a complex organ that is slow to yield its secrets, and without the benefit of imaging technology the clinical process does not get very far. But certainly neurologists did themselves no favours when they got seduced by lesion localization and pursued it for its own sake.

It was the advent of CT and MR scanning that finally liberated neurology from these shackles. Indeed, in the early days of brain imaging, it was commonly said that now that neurologists can see the lesion on a scan, they would have nothing to do. It was a joke—but only just. Such was the hold of lesion localization on the practice of neurology and on the perceptions it had created among professionals from other disciplines.

Modern neurology, thankfully, has finally emerged from this distracting influence. Over the last three decades, efficacious treatments have become available for the majority of neurological diseases, including epilepsy, migraine, Guillain-Barré syndrome, Parkinson's disease, multiple sclerosis, and ischaemic stroke. This revolution came about by keeping clinical outcomes foremost through the integrated application of basic research, drug development, biotechnology and clinical trial methodology.

And what about the extended neurological examination? With the availability of tissue-plasminogen activator as thrombolytic therapy for acute ischaemic stroke, even 3 minutes is a luxury, let alone 3 days.

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