The demonstration to an audience of 2000 at the Chicago meeting of the Radiological Society of North America in October 1972 of a machine depicting computerized tomography of the brain marks a watershed in 20th century medicine. Beyond, a visiting Martian could be forgiven for concluding that clinical neuroscience is brain imaging. Before, the elite discipline was neurophysiology. A recent publication provides a rare insight into the lifetime contributions of one extant giant from that post-Sherringtonian generation in which neuroscientists focused on the correlation of structure and function at the single neurone and systems level. Vernon Mountcastle’s *The sensory hand* is reviewed by Edward G. Jones (page 3413). After training in neuroscience in New Zealand and Oxford, and in subsequent posts in the United States (Washington University, St Louis and the Universities of California, Irvine and, now, Davis), Professor Jones has also made seminal contributions to neuroscience—in studies of the forebrain, and its connections, sensory perception and cognition. He considers *The sensory hand* to rank with two somewhat different but nonetheless classic texts—*The Hand* by Sir Charles Bell (1834) and *The principles of anatomy as seen in the hand* by Frederic Wood Jones (1919). All three celebrate a structure that can ‘see’ around corners and ‘speak’ through gestures such as the elevated middle ‘finger impudicus or obscenus’. Edward Jones applauds Dr Mountcastle’s studies (‘not venturing beyond what the neurons may be telling into the realms of speculative mumbo-humbo masquerading as theory’) of the, mainly, glabrous properties of low threshold cutaneous mechanoreceptors in the Old World monkey hand; and he traces the anatomical and physiological arrangements that inform place and modality from receptor to cortex, giving especially high marks to Mountcastle’s account of the parietal lobe and intercortical connectivities. But this is no sycophantic rehearsal of star performance by one thespian preening another. For, despite the erudition and authority of ‘one of the most important figures in modern neurophysiology’, there are criticisms and concerns, plus trenchant blows aimed at others—named ‘scientist-charlatans’ and the flash *Times Literary Supplement* reviewer of David Hubel and Torsten Weisel’s *Brain and visual perception* (see also *Brain* 2003: 128; 1226–1229). In particular, Professor Jones exposes limitations resulting from the particular focus of Mountcastle’s simian physiology that leaves unexplored the deep receptors of muscle and joints, and functions that make (even, we must assume, in Old World monkeys) ‘caressing a loved one . . . more than just a sensation of touch’. Perhaps also in neglecting the thalamus, Vernon Mountcastle takes a hostage to fortune with our reviewer since Professor Jones’s own book, *The Thalamus*, explaining its role in coordinating and regulating cortical function associated with consciousness, perception and arousal, and in which he charts the neuroscience, history and literature of this great nucleus that gates traffic between most, if not all, hierarchies of the nervous system, first published 20 years ago, is now extensively rewritten (and will be the subject of a *Brain* book essay in 2007).

Two papers in this issue touch indirectly on the complex role of immunity in repair from tissue injury. Jennifer Fleming and colleagues from London, Ontario (Canada) and Miami, Florida (USA) return to the thorny issue of protective immunity in the context of spinal cord injury by characterizing the inflammatory infiltrates in the centre, penumbra and apparently normal tissue from a series of cases studied immediately or up to 1 year after traumatic spinal cord injury (page 3249): despite the reparative properties of some inflammatory cells, their conclusion is that more harm than good is done during the initial phase of cellular infiltration, and anti-inflammatory neuroprotective measures are appropriate. Claudia Bühnemann and investigators from Magdeburg, Giessen, Hamburg and Düsseldorf (Germany), describe the survival, glial and neuronal fate, and physiological properties of embryonic-cell derived neural precursors grafted into an experimental area of infarction in rodents (page 3238): the outcome is conditioned by on-going immune responses that culminate in some transplanted cells expressing sodium currents, firing action potentials and displaying synaptic activity—suggesting that neuronal losses might be compensated by stem cell therapy. Unambiguously a bad thing is the immune response that leads to the production of anti-glutamic acid decarboxylase antibodies in stiff person syndrome. Now, Raghavan Raju and a team from the National Institutes of Health, Bethesda, and the University of California Los Angeles (USA) provide evidence that gamma-amino-butyric-acid (GABAA) receptor-associated-protein (GABARAP) is a new autoantigen in stiff person syndrome; and anti-GABARAP antibodies inhibit the expression of GABAA receptors thus impairing GABAergic activity in the central nervous system (page 3270).

A new disorder is described by Steven Vucic and colleagues from Randwick (Australia) and Boston (USA): mimicking the appearance of syringobulbia, facial onset sensory and motor neuronopathy (FOSMN syndrome) starts with trigeminal impairments progressing to a
cape-distribution pattern of sensory loss, and with bulbar motor involvement; but the electrophysiological and histological findings indicate a degenerative disorder of sensory and motor neurones in brain stem nuclei and the anterior and dorsal horns of the cervical cord (page 3384). Two papers discuss the therapeutic role of 'endurance training' in the mitochondrial myopathies. Tanja Taivassalo and investigators from McGill, Quebec (Canada), Newcastle-upon-Tyne (UK), and Dallas, Texas (USA) performed a cross-over study of training and detraining to show physiological adaptation resulting in transiently improved capacity for work and oxygen utilization in muscle that does not change with respect to mtDNA deletion heteroplasmy (page 3391). Tina Jeppesen and colleagues from Copenhagen (Denmark) report a broadly similar study that also demonstrates the beneficial effect of aerobic training on oxidative capacity and exercise tolerance in these patients, and there are no adverse effects on muscle mtDNA copy number or morphology (page 3402). Together, encouraging physical activity seems good (and probably safe) advice for maintaining exercise capacity and skeletal muscle oxygen utilization and extraction in the mitochondrial myopathies.

Amongst the papers on cognition and behaviour, Marie-Eve Doucet and a group from Montreal (Canada) explore the extent to which cross-modal re-organization (in this instance, visual function in deaf individuals treated by cochlear implants) adapts depending on successful restoration of hearing and speech recognition (page 3376): the results suggest enhanced audiovisual coupling as the basis for functional improvement in speech discrimination in deaf individuals who benefit from cochlear implantation. Max Hilz and colleagues from New York, NY (USA), Erlangen (Germany) and Cracow (Poland) describe autonomic responses to visual stimulation of varying emotional valence in patients with frontal lesions (page 3343); they conclude that the left ventromedial prefrontal region drives parasympathetic responses, and registers appreciation of pleasant stimuli, whereas sympathetic autonomic reactions, and reactions to unpleasant scenes, depend on that same region in the right hemisphere. On a related theme, Dawn Bowers and colleagues from Gainesville, FL (USA) use the startle blink response to explore the role of the amygdala in reactions to unpleasant events in cognitively intact dopaminergic medicated individuals with Parkinson’s disease (page 3356); they show blunted responses in these patients that are not confounded by motor difficulties or altered mood but correlate with disease severity, suggesting that the amygdala normally translates cognitive appraisal into somato-motor arousals required for the aversive behavioural response to a nasty fright.

In his scientific commentary (page 3147), Kenneth Smith surveys four papers that inform the subject of demyelination and remyelination, and the molecular changes associated with adaptation of the denuded and re-coated axon, in the context of multiple sclerosis and experimental models of that disease (pages 3165, 3173, 3186 and 3196). He suggests that active remyelination—rather than offering a welcome ‘Bandaid’ to the naked nerve fibre—may in fact represent a particularly perilous period during which the axon is especially vulnerable to damage from abnormal ion fluxes; hence, neuroprotection is especially important at this crucial stage in the cycle of injury and repair. On this subject, we end as we began. Brain has always been a repository for new discoveries relating to the physiology of nerve fibres in the peripheral and central nervous systems. In From the Archives, we review: Focal experimental demyelination in the central nervous system, by W.I. McDonald and T.A. Sears, Brain 1970: 93; 575–582; The effects of experimental demyelination on conduction in the central nervous system. By W.I. McDonald and T.A. Sears, Brain 1970: 93; 583–598; The restoration of conduction by central remyelination, by K.J. Smith, W.F. Blakemore and W.I. McDonald, Brain 1981: 104; 383–404.

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