

Book Reviews

JAVIER DeFELIPE and EDWARD G. JONES (eds), *Cajal's Degeneration and regeneration of the nervous system*, transl. Raoul M. May, History of Neuroscience No. 5, New York, Oxford University Press, 1991, pp. xvi, 769, illus., £60.00 (0-19-506516-6).

One of the most exciting parts of neuroscience is the rapidly growing field of developmental neurobiology. As in all scientific enterprises today, the increasing volume of literature means that most participants are content to peruse only material of the last two or three decades. However, in this particular area of research ideas and experimental data reported almost eighty years ago are of relevance to modern workers.

Santiago Ramón y Cajal (1852–1934) of Spain was the most eminent histologist of the nervous system since investigations began in earnest during the 1830s. It was he who, along with Wilhelm His (1831–1904) and August-Henri Forel (1848–1931), confirmed the individuality of nerve cells, as formulated in the neurone doctrine. This was, however, only a small part of his life's work, which ranged over all types of nervous tissue, including the retina. In 1913 and 1914 he published *Estudios sobre la degeneración y regeneración del sistema nervioso*, a classic book based on six years' work. In it he reported a remarkable series of observations and experiments on all aspects of the nerve regeneration process, using his own staining techniques amongst others and critical analyses of his findings. As was his custom, he made liberal reference to his contemporaries and pupils, and, as well as describing his laboratory results, he also recorded theoretical interpretations arising from them together with new ideas and hypotheses. It is here that the modern developmental neurobiologist finds material eighty years old but still relevant to today's research.

Cajal's axone outgrowth theory, *neurotropism*, favoured the role of extraneous trophic agents in stimulating axone growth and of highly specific interaction between particular axone terminals and their synaptic sites following nerve fibre damage or section. For some time this theory was not widely accepted, but recent investigations seem to confirm the original thesis. Thus, his basic theories of neurogenesis and nerve degeneration have provided valuable guides to subsequent workers, which has also been the case with other parts of Cajal's writings.

His book of 1913–14 had a limited distribution and was virtually unknown in Europe and North America before 1928, when this English translation with the author's appended notes appeared. Despite facsimile reprints in 1959 and 1968 it, likewise, was never widely available and this has induced the present editors to re-issue the English translation. In so doing they have produced one of the very best types of modern reprints. The text is untouched, but 160 pages have been added. These include: a brief discussion of the usefulness of the book to modern research; a list of textual *errata*; valuable extracts from Cajal's other works which relate to this topic; an account of his labours by his favourite pupil, J. Francisco Tello (1880–1958); and a bibliography of Cajal's references to the original text, corrected and amplified.

It is to be hoped that this book will induce future editors of reprints to include similar enrichments. In the meantime it will be of value to the modern neuroscientist as well as to the historian of this speciality.

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PETER J. BOWLER, *Charles Darwin: the man and his influence*, Blackwell Science Biographies, Oxford and Cambridge, Mass., Basil Blackwell, 1990, pp. xii, 250, illus., £19.95 (0-631-16818-4).

LUCILLE B. RITVO, *Darwin's influence on Freud: a tale of two sciences*, New Haven and London, Yale University Press, 1990, 8vo, pp. xii, 267, £19.95, \$35.0.

Although a long-time stalwart of the Darwin industry, Peter Bowler has travelled significantly less far in the direction of a social history of science than have most of his peers. The author of *Evolution: the history of an idea* (1984) displays an abiding commitment to a more traditional