dystrophy. This is a metabolic response characterised by the appearance of so-called "spheroids", ovoid axonal swellings believed to be a constant feature in superficial haemosiderosis.^{3,4} We have reported the finding of spheroids in the superficial layers of the cortex in three such cases as well as in the neighbourhood of haemosiderin deposits in eight cases of intracerebral haemorrhage.⁵ As spheroids were found in no other areas of these brains we suggested that haemosiderin results in NAD because of a local oxidative effect, perhaps due to lipid peroxidation.⁶

This possibility may have therapeutic implications as it could perhaps lead to the use of antioxidants such as Vitamin E with hope of retarding clinical deterioration and in particular, dementia. In this connection it

is of interest to note that neuroaxonal dystrophy is a feature of Vitamin E deficiency.⁷

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Book reviews

Nineteenth-Century Origins of Neuroscientific Concepts. By Edwin Clarke and L S Jacyna. (Pp 593; \$65.00.) California: University of California Press, 1987.

This book traces the ideas that emerged in the early part of the 19th century that led to the development of the neurosciences as we know them today. This period was crucial to the development of science as a whole and in neuroscience the old anatomical and physiological concepts, some of them held for hundreds of years, were overthrown and replaced by the emerging disciplines of experimental science. The authors take as their theme the development of ideas in neuroscience in relation to the prevailing philosophical ideas of the time, and in relation to the available and emerging technologies that enabled the observations to be made that themselves lead to recognition of the inadequacy of the earlier concepts. Thus the book is broken up into six main headings concerned with the cerebrospinal organisation of the nervous system, the nerve cell, reflex function, nerve function, brain function and the vegetating nervous system. The book is therefore concerned mainly with conceptual aspects of neuroscience, particularly derived from the concept of natural philosophy emerging from the work of the German philosophers in the early years of the 19th century, particularly Hegel and Kant and the development of the research tradition that occurred in universities such as Göttingen in the last years of the 18th century. These concepts were taken up in France and

the United Kingdom, particularly in London and Edinburgh, and used as the basis for experimental observation. In the early part of this period of ferment, clinical observations, such as those on the effects of lesions in the nervous system, allowed the foundations of studies of the major motor and sensory pathways to be laid and led to the gradual formulation of ideas concerning localisation of cerebral function, and of the more difficult task of the localisation of intellectual function within the brain. The problem of localisation of function was particularly important in relation to the cultural context of the time. It had earlier been held, particularly by Haller, that the brain had functional equipotentiality. This was refuted by Gall who held that the brain was composed of several discrete parts each with its own peculiar properties each representing the specific intellectual and moral faculties. Much has been written elsewhere concerning this concept and the role of Flourens in substituting the concept of functionally distinct sub-divisions, concepts that led to current ideas on cortical localisation. The authors are particularly interesting in their account of the development of these ideas of brain function. The book is, throughout, thoroughly well researched and detailed in its account of the development of these concepts. References are given at the end of the book together with detailed accounts of individual contributions in relation to the references, and to individual scientists listed by name in alphabetical order. This is a splendid source of information on 19th century neuroscience.

For the amateur historian, however, the book lacks *joie de vivre* in that there is

nothing said about the personal interactions between the scientists and the philosophers whose contributions are discussed in such detail. The casual reader would love to know the circumstances of the discussion between the proponents of Gall and Flourens, or the kind of reception received by Sir Charles Bell in his presentations and writings. Indeed, the contribution of localisation concepts to brain function in relation to the development of psychiatry receives somewhat scant attention. The ideas of the evolution of the nervous system arose out of some of these concepts and fall largely out of the scope of the book, although they receive adequate mention in the closing pages. One wonders how widely some of the ideas discussed were disseminated through 19th century culture and what was their influence on teaching, education, and the philosophy of everyday life. There is also much to be learned, and not really considered in this book, concerning the economics of research during this period. Many of the contributions of note appear to have been made by individual practitioners, perhaps working in relative isolation, and the institutionalisation of neuroscience, an important topic in relation to the dependence of scientific research on major funding from government sponsored institutions in the present time, receives no attention.

Altogether this is a splendid, if somewhat dry, account of the development of neuroscience concepts from the foundations laid in the Enlightenment by workers in the early part of the 19th century. An absolute must for anyone interested in history, neurology and neuroscience.

M SWASH