

Editors' note

This special issue of *Current Science* is the happy result of an unusual joint initiative by a physical scientist (S. R., Editor of *Current Science*) and a visiting biomedical scientist (G. M. M.). Both of us have been struck by the changing demographic patterns throughout the world and the need to address its implications for possible reassessments of long-term research priorities. As a developing country, India shall surely recapitulate the explosive growth of the geriatric populations currently taking place in the western world. Among the many new public health problems that will emerge as a result of the 'graying of India', none is more compelling than the insidious, progressive declines of cognitive function that are so tragically prevalent among older people. These can have a number of etiologies that may be intricately tied to one or more of the intrinsic biological processes of ageing, but that may also reflect both special genetic susceptibilities and special circumstances of the environment. Among these, vascular pathologies, especially those leading to multiple small infarctions (multiple small strokes) can be quite prevalent, although, because of the recent introduction of effective agents for the control of age-related increases in blood pressure and for reasons we still do not understand, many regions of the developed world (including the home institution of G. M. M.) are seeing comparatively fewer such cases. Instead, we are seeing more cases of the type of neuropathology called Alzheimer's disease. This pathology also includes a vascular component (depositions of an abnormal protein called beta-amyloid), but is also characterized by major degenerative neuronal changes. The number one risk factor for this chronic, dementing illness is advancing age, the relationship exhibiting exponential kinetics. We have therefore focused upon this disorder as a kind of prototype for future research on disorders of an ageing population.

The special issue is organized into five units. Unit One serves as an introduction, giving a general historical overview and a basic discussion of current views on pathogenesis. Holger Hoehn of the University of Würzburg (from which institution Alois Alzheimer received his MD) (page 407) provides an original translation of the short, but seminal description of Alzheimer's original 51-year-old patient. Hoehn's English translation differs significantly from a previous such publication and will certainly be welcomed by medical historians. Moreover, the Hoehn paper puts that contribution into a proper perspective. There follows an authoritative account by an American neurologist, Robert Katzman (page 416), as to how Alzheimer's disease gradually came to be recognized as a major

public health problem in his society. Katzman was himself a pioneer in that regard and continues to play a leading role in epidemiological investigations of the disorder. Finally, one of us (G. M. M.) presents (page 410) a view of pathogenesis that emphasizes what many would now regard as a seminal role for the metabolism of a family of proteins called beta-amyloid precursor proteins. The major motivation for such a view comes from the discovery, in a few special families around the world, of mutations in the gene coding for such proteins.

Unit Two is concerned with the phenotypes of degenerative disorders of the central nervous system. N. H. Wadia, (page 419) a leading Indian neurologist, nicely summarizes the Indian experience with such disorders and shows how clearly the parameter of age influences what types of degenerative disorder one is likely to encounter. S. K. Shankar (page 430) gives a thorough account of the neuropathology, but also ties this into pathogenesis.

Unit Three, dealing with demography and epidemiology, starts with a paper by P. N. Mari Bhat (page 440) summarizing the present and anticipated future demographic trends in India. An interesting prediction is that states in which a decline in fertility has been substantial (Kerala, Goa, Tamil Nadu and Punjab) are likely to experience particularly rapid 'population ageing' in the near future, with important implications for public policy. There follows a paper by S. A. Barodawala and P. S. Ghadi (page 449) giving original data on the spectrum of neuropathology currently being observed in a general hospital in Bombay. It demonstrates the substantial potential for such research at major medical centres, within India. A valuable, comprehensive overview of cross-cultural research on the epidemiology of Alzheimer's disease is given by L. R. White (page 456), an American member of a consortium of investigators who are now pioneering such studies. Unit Three concludes with a contribution by the distinguished Indian neuropathologist, D. K. Dastur (page 470), who reminds us of the evidence that environmental neurotoxins and novel infectious agents may result in degenerative and dementing disorders.

Unit Four deals with the growing importance of a genetic approach to understanding why some individuals and some families seem to be particularly susceptible to Alzheimer's disease. The general principles of neurogenetics and linkage analysis outlined by T. D. Bird (page 485) and F. M. Wijsman (page 487) are shown by G. D. Schellenberg (page 491) to have been productively applied to families with autosomal dominant forms of the disease.

Unit Five ends the issue via a scholarly review, by S. S. Agarwal (page 495), of a sample of the recent biomedical literature on Alzheimer's disease.

We would like to have done more with this special issue of *Current Science*. Psychosocial issues are not represented, although they are of great importance. These are subjects for some future publication. Nevertheless, we trust that our efforts and those of our contributors will point to new opportunities for relevant biomedical research in India, particularly

genetic, neuropathologic and epidemiologic approaches to the study of degenerative disorders of the ageing brain. The fact that at least half of us can live well into our eighties without clinically significant cognitive decline should indicate that there are potential interventions that could allow *all* of us to enjoy cognitively successful ageing.

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