A. Definition of Alzheimer’s Disease and Scope of Chapter

Alzheimer’s disease (AD) may be defined clinicopathologically as a progressive presenile dementing organic brain disease, starting insidiously between 40 and 65 years of age. The dominant psychiatric symptoms are amnesia, apraxia, agnosia, and aphasia, the most prominent pathoanatomical correlate of which is cerebral atrophy with striking histological changes such as senile plaques and neurofibrillary degeneration.

ALDRED ALZHEIMER in a lecture in 1906 first presented the disease that was to bear his name and later published a more complete account (1907, 1911). It is striking how he was able to identify from a limited material most of its major features including the clinical picture. Thus he reported a bilaterally symmetrical cerebral atrophy that was most pronounced in the temporal and parietal lobes, less marked in the frontal lobes but spared the central areas. This pattern he found also to be paralleled by the distribution of senile plaques and neurofibrillary tangles, which latter structure he discovered. He also described other changes such as degeneration mainly of the superficial cortical layers, various forms of neuronal alterations and spongy degeneration. Since then many of these findings seem, however, to have been forgotten or neglected.

ALZHEIMER regarded the disease as separate from senile dementia. The question whether senile dementia of the Alzheimer type (SDAT) (dementia senilis alzheimerisata) and AD are separate diseases or not is still debated. Attempts or suggestions to separate the diseases have been made on structural and topographic (SHIFFER 1977; SOURANDER and SJÖGREN 1970; SCHEIBEL 1979 b), clinical (ROTH 1971, SJÖGREN et al. 1952) or genetic (LARSSON et al. 1963) grounds. The evidence has been regarded by others (TERRY 1978 a; CONSTANTINIDIS 1978) as unconvincing. An epidemiological approach is recommended by GRUFFERMAN (1978). The delineation from ageing is equally unclear. BOWEN et al. (1979), however, arrives at the conclusion that with its selective loss of cholinergic neurons AD is a primary degenerative nerve-cell disorder and not just simple premature ageing. Furthermore, aged brains do not always show senile plaques and tangles and in SDAT tangles may be missing.

By definition, AD and SDAT are presently mainly separated by age of onset, and also intensity of the degenerative process, differing thus rather on quantitative than on qualitative grounds. The three “conditions” AD, SDAT, and ageing may be regarded as facets of the same process (CONSTANTINIDIS 1978) or AD and SDAT as the same disease regardless of age of onset (NEUMANN and COHN 1978).
Among cases designated as AD there are some which do not conform to the majority with regard to main features and which are therefore set aside as atypical and treated separately. The main presentation to follow here concerns the great bulk of cases with AD conforming to the definition given above but not SDAT, which is treated in Chap. 8 in this volume, although structural and many clinical features are alike.

Our concept stems from experiences in a collaborative study on AD involving psychiatrists (L. Gustafson), neuropsychologists (J. Risberg and B. Hagberg), neurophysiologists (D. H. Ingvar), and neuropathologists (A. Brun) at the University of Lund in Sweden. AD and SDAT have been the subject of many extensive and elegant clinicopathological presentations through the years. During the last 10–15 years new techniques and new branches of basic medical science have tremendously expanded our knowledge in this and neighbouring fields. This has resulted in a vast literature, difficult to cover, ranging from e.g. bio- and histochemical, ultrastructural, virological, immunological, and cytogenetic research to neurophysiological, e.g. electroencephalographic and isotope-guided blood flow studies. This has led to important new findings and elucidation of many older problems. With reverence and reference to the older literature it will therefore be covered less thoroughly than recent writings.

B. Frequency and Sociomedical Importance

AD is the most common of all organic presenile dementias. The real prevalence or incidence is, however, difficult to define since most figures refer to AD and SDAT together. Studies including cases of dementia above 65 (Tomlinson, cit Terry 1978a) and 55 (Jellinger 1976) years of age agree on a figure of about 50% for dementias caused by Alzheimer lesions, while, e.g. Pick's disease accounts for little more than 2%. Sjögren et al. (1952) calculated a morbidity risk of 0.1% for Pick's disease and presenile AD together, meaning 75 new cases per year in Sweden, viz. mostly examples of presenile AD. The frequency of AD in a geriatric patient material, well documented both clinically and histopathologically, was a high as 5.6% (Sjögren and Sourander 1962). Most studies concern relatively small groups or communities, but a large scale investigation may be more enlightening such as that presently under way in Finland (Palo et al. 1979).

Exact figures are thus difficult to obtain for the presenile AD under discussion. However, with the approximate figures available and a disease duration of a few to 15 or even 20 years, with a considerably shortened life span, it is obvious that AD is a great social problem and a heavy burden to medical institutions. This statement is even more valid if SDAT is included in a unitarian concept of the disease.

C. The Clinical Picture of Alzheimer's Disease

I. Clinical Characteristics and Course of the Disease

As early as 1907, when Alois Alzheimer in his lecture „Über eine eigenartige Erkrankung der Hirnrinde“ first described what he considered a new disease entity,