Book Reviews

Pesticides and Health

Aldrin, Dieldrin, Endrin and Telodrin. An Epidemiological and Toxicological Study of Long-Term Occupational Exposure. K. W. JAGER. Elsevier, New York, 1970. viii, 234 pp., illus. $9.

The cyclodiene insecticides have been produced in large tonnage at the Shell Chemical Company plant at Pernis, Rotterdam, beginning with aldrin in 1954. Jager's book deals with a long-term study of the health effects of occupational exposure to the pesticides aldrin, dieldrin, endrin, and Telodrin in a group of over 800 workers at this plant.

Studies of this sort are needed to provide data on the effects of pesticides on human health to supplement experimental studies using animals. Workers may be exposed for long periods to dosages many times higher than those to which the general population is exposed. Therefore, as Jager points out, it should be possible to detect toxic effects in these subjects earlier than they would occur in the general population. This is the most comprehensive study yet published on the health effects of occupational exposure to pesticides.

The twice-yearly medical examination of these workers was quite thorough and included medical and occupational history and general physical examination with (yearly) chest x-ray, urinalysis, blood count, liver function tests, electroencephalography, and determination of blood concentrations of the pesticides under study.

There is no doubt of the high, acute toxicity of these pesticides, as shown by the 54 cases of clinical intoxication reported and by the 52 transfers of pesticide workers to other, unexposed activities on account of suggestive nonincapacitating symptoms. The reported symptoms were reversible and disappeared after cessation of exposure. Medical history and examinations revealed no disproportionate incidence of other types of illness.

A most interesting finding was the fact that endrin workers had lower blood concentrations of DDE than did controls whereas aldrin and dieldrin workers showed no differences from controls in this regard. Also, the excretion of 6-beta-hydroxycortisol in urine remained normal in aldrin and dieldrin workers but was elevated in endrin workers. These results suggest that in man aldrin and dieldrin exposures up to 175 times the exposure level of the general population do not stimulate the enzyme system that metabolizes DDE. However, occupational exposure in endrin manufacturing does appear to induce this enzyme activity.

In general, the author's evaluation of the clinical and laboratory data on the worker groups appears to be sound. However, it must be kept in mind that, in the case of diseases with low incidence and long incubation periods, large numbers of subjects or very long periods of observation or both would be required to detect small differences in incidence between the worker group and the control population.

The early chapters of this book provide a thorough summary of general toxicological data on the cyclodiene insecticides.

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The Myelin Sheath

Myelination. A. N. DAVISON and ALAN PETERS. Thomas, Springfield, Ill., 1970. xiv, 238 pp., illus. $13.50. American Lecture Series, No. 782.

The myelin sheath is a highly ordered material deposited around certain nerve fibers in higher animals. Fibers ensheathed with myelin are able to conduct nerve impulses up to 100 times faster than small, unmyelinated fibers. The advantage of possessing myelinated nerve fibers is obvious, and in higher animals myelin may account for as much as one-third of the weight of nervous tissue. As would be expected, damage to the myelin sheath leads to serious neurological disease (multiple sclerosis, for example). Studies of myelin are thus important to both the biologist and the physician.

During the past 15 years new anatomical and biochemical techniques have considerably changed our views regarding the nature of the myelin sheath. The electron microscope has established that the myelin sheath is formed from the membrane of a nonneuronal cell; biochemical techniques (including methods for isolating myelin from brain tissue) have allowed precise determination of the constituents of myelin, as well as studies of the alterations in these constituents during development and in disease.

The strength of this timely book is the primary collaboration of an anatomist and a biochemist—both active contributors to the knowledge of myelin acquired during the past decade. The initial chapter, on the morphology and development of the myelin sheath, is complete, well illustrated, fair, and indeed fascinating. (How does one myelinating cell provide segments of myelin of appropriate thickness for as many as 30 different nerve fibers?) The second chapter, on myelin biochemistry, documents the gradual evolution in thought regarding the turnover of myelin components. Initially myelin was considered to be one of the most stable materials of the body, but recent biochemical studies (utilizing more direct labeling techniques) have established that each myelin component has its own turnover rate, half-lives varying from over a year for cerebrosides to about 35 days for the three protein components. This chapter also documents the gradual realization that myelin is not composed of typical plasma membrane (though it is formed therefrom); its chemistry reflects its special function as a barrier material, without agencies for active transport.

The third chapter falters somewhat. Beginning with the unfortunate misprint that "whether or not myelination results in intellectual or other deficiencies is not yet established," it treats the problems of abnormalities of myelin composition too superficially to establish certain of the arguments set forth. With respect to small defects in the book two other points may be made: (i) The surname of the German histologist Lanterman, who published on the presence of the clefts along the length of the myelin sheath