It is almost 20 years since the appearance of Spencer and Schaumburg’s ground-breaking volume on occupational and environmental neurotoxicology, which gave us a comprehensive survey of the subject as understood at the time. That book served a useful purpose but is now largely out of date. Dr Feldman’s new work has a different approach. It is a survey of the problems posed by occupational and environmental neurotoxicology as shown by a comprehensive and detailed account of the effects of 20 chemicals widely employed in industry. These include various metals, several types of widely employed solvent and agrochemicals to which workers in the field and in the factory become exposed. In the context of the title, the ‘environment’ is that contaminated by man’s industry and inventiveness stemming from his desire to improve the lot of his race, of which this book offers the most noteworthy examples. It does not include toxic substances of the natural environment derived from animals, plants, insects, dinoflagellates, bacteria or other living organisms, interesting though these certainly are. This is a handbook providing all relevant details of these 20 important chemicals, enabling clinicians and others to have ready access to such data. It even goes so far as to provide web site addresses, so that up-to-date information can be obtained about regulations governing the use of potentially hazardous compounds in the workplace, their threshold limit values, permissible exposure limits and so forth as laid down, in this instance, by various American government agencies. It is a pity that WHO and European sources of information are by and large not included, but these may not have been so readily available to the author.

The complex question of the clinical recognition of the chemically exposed person and the relationship between this event and the development of symptoms is an important matter that is discussed in thoughtful detail. This is probably the most difficult question facing the clinician and the highly sophisticated physiological and behavioural/psychological methods that can now be brought to bear to detect deviations from ‘normal’ are given close attention. Such objective methods should be applied wherever possible, although it must be admitted that interpretation of their results may not always be straightforward. There is the ever present question as to how real the patient’s symptoms are and how much there is perhaps a psychological overlay to be uncovered. Chemicals produce their effects by modifying the basic metabolism of the individual, and individuals are by no means uniform in their response to such agents. Witness the case of the woman who had worked in the dry cleaning business, who, after an episode of overexposure, became abnormally sensitive to the merest trace of similar solvents in her home. Even the mild consumption of alcohol is another variable that may determine whether a subject will respond adversely or not to solvents, and how real the once identified New Building Syndrome was will, perhaps, never be known. A large uncertainty in the equation is the individual’s response to behavioural testing, a technique now playing an increasing role in ascertaining whether exposure to certain chemicals, particularly solvents, is having an adverse effect. In this section there is a lot of information not only for the clinician but also for the worker, the trade unionist and the manager, for to be well informed about possible chemicals hazards is to be protected against them. The lawyers may also find food for thought as well as action in the lists of symptoms reported to affect those exposed.

Throughout this volume it is apparent that Dr Feldman has maintained a lifelong interest and developed a wide experience of cases of exposure to hazardous substances in the workplace. He has methodically set out each section on the 20 chemicals in a standard manner to include exhaustive data on sources of exposure, exposure limits and safety regulations, tissue distribution, biochemistry, clinical manifestations, neurophysiological, biochemical, neurobehavioural and neuropathological diagnosis and prevention and therapeutic measures, ending in every instance with a number of clinical experiences that encapsulate each intoxication. Much of this information is tabulated and illustrated from his own or others’ experience and, together with a full bibliography, make a valuable work of reference for any whose business brings them into contact with the potential hazards of the chemical industry. Vigilance is the price we must pay for the great benefits that stem from the chemical industry and it is only by being aware of the experience of others that we can be watchful. The need for vigilance continues in view of the numbers of cases of industrial illness reported each year and the probable larger number that go unreported where the diagnosis has been missed.

In such a book there are bound to be good and not-so-good points and its strength lies in its wealth of clinical and laboratory information. The neurophysiological examination of the peripheral neuropathies of arsenic, lead, mercury, the solvents, CS₂ and hexacarbons, and the various organophosphates used widely in the agrochemical industry are good guides to follow and necessary for separating natural
diseases from those truly developed from the workplace, a
distinction not always easily made. Where the author does
fall down occasionally is in his delineation of the underlying
pathogenetic mechanisms of the toxic lesions. Thus, the
mechanism of pentavalent arsphenamine encephalopathy is
quite unrelated to the process responsible for the peripheral
neuropathy of trivalent arsenic. The former is a hyper-
sensitivity, Arthus-like vascular response that for some reason
selectively affects the small cerebral vessels and may occur
after only a single dose of arsphenamine, while the latter
arises from a block in the pyruvate dehydrogenase system at
the lipoate step and is thus a pure energy deprivation effect.
Since thiamine and lipoate, to which arsenic binds, lie next
to one another in the pyruvate dehydrogenase complex, this
similarity of effect is hardly surprising. The resemblance of
arsenical neuropathy to beri-beri due to vitamin B1 deficiency
is thus explicable and has long been recognized. Witness the
Salford outbreak of arsenical poisoning in 1900 that was at
first considered by many experienced clinicians of the time
to be an outbreak of beri-beri. It was ultimately shown to
have been an environmental disaster, the result of arsenic
contamination of mined sulphur subsequently used in the
local brewing process. There are several other similarly close
toxic relationships that the author could have drawn attention
to. Triethyl lead produces exactly the same changes in the
brain as trimethyl tin, hence the close similarities in their
symptomatologies, quite different to the effects of inorganic
lead or triethyl tin toxicity. Similarly, the neuropathy of
hexacarbons is virtually identical to that of CS2 due to similar
cross-linking neurofilaments in both the peripheral and central
nervous system axons. The additional capacity of CS2 to
bind to copper and inhibit the copper-dependant enzyme
dopamine-β-hydroxylase, gives a further psychiatric
dimension to the CS2 toxic syndrome. Of course it is
important that the empirical clinician is aware of these
matters, for not only does it make the understanding of each
process simpler and helps to explain many of the signs and
symptoms, it must also contribute to a more rational process
in the judgement of prognosis and management. Toxicology
is one of the major areas of medicine where the cause of the
illness is known and for that reason the signs and symptoms
should be understood. With the accumulation over the last
three decades of such a large volume of data from
experimental and human studies, it becomes increasingly
urgent to sort out some of the underlying principles of
neurotoxicity. This subject area is distinctly absent in
Occupational and Environmental Neurotoxicology, but
because of its wealth of clinical and laboratory information
the book will be much valued by clinicians and others, and
is recommended for the shelves of both the office and
the library.

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