

have drawn the description of the testing equipment and many details of experimental methods from current American specifications, and not all the tests described can be applied to meet specifications accepted in Great Britain. The section dealing with the determination of pH is perhaps unnecessarily sketchy and curtailed, and this criticism can be applied to most of the physico-chemical methods described in later chapters—polarographic methods, for example, being dismissed in one page.

The chapters dealing with the analysis of solvent mixtures cover both the chemical examination of the liquid solvents and the absorption and examination of solvent vapours. Several schemes are given for chemical identification, and a section on the determination of functional groups is included. One feels that ultra-violet and infra-red spectroscopic methods should merit inclusion in this section, since both can be very useful tools in the analysis of mixtures.

The remaining two-thirds of the book is occupied by detailed analytical procedures for specific groups of solvents. Included are aliphatic, aromatic and cyclic hydrocarbons, alcohols and polyhydroxy compounds, esters, acids, aldehydes and ketones, and solvents containing nitrogen and sulphur. Methods suitable to the general group of solvents, again mainly drawn from specifications, and detailed procedures for the determination of individual solvents are described. The use of trade names for reagents is sometimes confusing, and a mistake appears in the tests for acetic anhydride and formic acid. The general layout and binding are excellent, and the contents list and index satisfactory. References in the text are numerous, and an additional list of selected references is to be found at the end of each chapter.

The book is a most valuable addition to the library of all analytical chemists, and all concerned with the varnish and lacquer industries will find it particularly useful as a book of reference.

C. WHALLEY

WHAT IS KNOWN ABOUT SLEEP

Sleep

How to Get More of It. By Chapman Pincher. Pp. 120. (London: "Daily Express", 1954.) 5s.

THIS little volume will probably be added to the 3,500 titles currently listed in "How-to-Do-It Books: A Selected Guide"—books that are intended to instruct the reader in "how to do, be, become, make, or cope with something". However, in this sense, the title of Mr. Pincher's book is misleading, as it contains nothing to suggest that *more* sleep is desirable, or how to get it. Quite to the contrary, there is a chapter on "How to Stay Awake".

The eighty-odd pages of text, divided into seventeen chapters, each preceded by an appropriate humorous drawing, represent a fairly accurate digest of findings in research laboratories and hospitals, culled from "day-to-day study of technical reports from many countries". Interspersed historical and contemporary anecdotes pertaining to sleep, as well as accounts of the author's own varied experiences, in war and peace, serve to enliven an otherwise dry recital of scientific and medical discoveries. Mr. Pincher's interpretations of the latter are, unfor-

tunately, not altogether free from contradiction and one-sidedness. Thus, in Chap. 1 ("Settling Down to Sleep"), he chooses to "plump for the side-lying posture put forward recently as most satisfactory by Dr. James McDonnell, a London physician", using three drawings to illustrate the one proper and two faulty positions. Nevertheless, he admits, in the same chapter, that "no matter what posture you adopt for going to sleep however you are certain to change your position many times during the night". Evidently it makes little difference whether one goes to sleep in one position or another. Yet Mr. Pincher states that when he directed attention to Dr. McDonnell's recommendation in a newspaper, several readers wrote to him "gratefully because the information had brought them more restful sleep than they had enjoyed for years".

The author rightly rejects the old 'anæmia theory' of sleep; but, on the basis of a reported lowering of the degree of oxygen saturation of hæmoglobin, surmises that "the brain as well as the rest of the body is subjected to some degree of oxygen starvation during sleep" (p. 25). He further declares that "there is no doubt that the blood-supply to the brain is considerably reduced during sleep" (p. 41). As a matter of fact, the brain consumes just as much oxygen during sleep as in wakefulness (about 3.5 ml./100 gm./min.), and, as to blood flow, it is actually *increased* some 10 per cent (from 59 to 65 ml./100 gm./min.) in sleep, due to the dilatation of the cerebral blood-vessels.

Mr. Pincher abandons his role of mere interpreter of technical reports when, in Chap. 11, he propounds a theory of antidromic conduction from the visual area of the cerebral cortex back to the retina as an explanation of hallucinations. That a *psychological* projection from the brain to the visual field is involved in normal vision of real objects was convincingly demonstrated by Christoph Scheiner in 1614. A hallucination, therefore, or seeing things that are not actually there, can result from cortical stimulation (chemical, electrical, or other) that originates locally, instead of in the outside world, via a retinal image. It should be admitted, however, that the general reader will not comprehend, and so will not be harmed by, the author's excursions into the realm of oxygen starvation or theory of hallucinations.

The book also deals with the physiology of wakefulness and the diurnal variation in alertness. Many a reader will rid himself of a guilt complex on learning that Mr. Pincher found what he "had been seeking for thirty years—a medical reason for getting up late in the morning and going to bed late at night" (p. 32). Other topics touched upon are: dreaming, snoring, insomnia, sleep in animals and babies. Concerning the latter, it is not true that new-born babies sleep "most of the twenty-four hours", and that sleep is reduced to eighteen hours at three months and to seventeen hours at six months (p. 101). Recently published figures show that the average baby sleeps only about fifteen hours at birth and less than fourteen hours at the age of six months.

Summing up: when he is not venturing beyond his eruditional depth, Mr. Pincher does an excellent job of popularizing science. Disregarding the 'howtoism' of its title, and considering the universal interest in the subject-matter, the book will be found both instructive and entertaining. It can be recommended to the non-scientific reader as one of the better written accounts of the nature of sleep and wakefulness.

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