to survey an even wider field including not only proteins, nucleic acids, polysaccharides, lignin and rubber, but also inorganic polymers—the constituents of rocks. In general, it is reasonably successful but this is an enormous expanse to cover and it is scarcely surprising that both authors and reader are left a little breathless from time to time. The last title, *Aspects of Analytical Chemistry*, is the most technical of all and one wonders whether it is not perhaps rather a marginal subject for a series of this nature. Dr Chalmers rightly emphasizes that "analytical chemistry is presented not as a separate branch of chemistry, but in its proper relation to chemistry as a whole", and the examples and situations that he chooses are for the most part good ones, but for all that it still smacks too much of the straight textbook rather than material for the educated layman.

Production standards remain good, although the organic chemical formulae still leave something to be desired, and the volumes are excellent value for the money.

PETER SYKES

REFERENCES TO SCHISTOSOMES

Schistosomiasis

A Bibliography of the World's Literature from 1852 to 1962. By Kenneth S. Warren and Vaun A. Newill. Vol. 1: Keyword Index. Pp. xv+598. Vol. 2: Author Index. Pp. vii+395. (Cleveland, Ohio: The Press of Western Reserve University, 1967.) $20 the set.

THIS great compilation covers references to virtually all that has been written on schistosomiasis from the influence of cosmic forces on the eggs schistosomes lay to the electron microscopy of their flame cells. The two volumes represent a tremendous amount of effort on the part of both man and computer. The arrangement is good; the first volume lists the entries under approximately 2,000 very carefully selected keywords which are additionally listed in an appendix. In the second volume the same entries are arranged chronologically under their authors; it is thus possible to find an author's complete output on this subject grouped together in chronological order even though he may not be the senior author of some, or any, papers. There are 10,286 references; more than half the titles were in 24 foreign languages and have been translated into English. This in itself is valuable, for much work in this field has been done by Japanese, Portuguese, French and German workers and is liable to be overlooked because of language difficulties. There are 1,409 Japanese and 1,392 Portuguese titles. Of the citations 75 per cent have been verified against the original.

The result of all this labour is a source of references which cannot fail to be of great value to all connected with work on schistosomiasis, be this basic research, clinical implications or field control. It must be remembered that much evidence points to the spread of schistosomiasis in many developing countries and its increasing importance as a factor hindering their development. An extension of the bibliography beyond 1962 could, it is stated, be gathered "quite easily in comparison with obtaining the early literature", and it is to be hoped that now the production mechanism has been set up this extension will be carried through. Publication at short intervals would be preferable for those wishing to use recent work. Indeed, for most workers in this field it is the recent work which is of greatest importance and the question arises as to whether the collection of the earlier references has been worth the effort bearing in mind the practical use to which they will be put. We must, however, be grateful to those who have had the energy and time to make this compilation and suggest that the work be continued in the form of frequent, perhaps annual, extensions to the present volumes.

A. W. WOODRUFF

SMOKING AND CANCER

Tobacco and Tobacco Smoke

Studies in Experimental Carcinogenesis. By Ernest L. Wynder and Dietrich Hoffmann. Pp. xiii+730. (New York: Academic Press; London: Academic Press (London), 1967.) 270*s*.

THE first thing that should be said is that this is a good book—a specialist's book—which should be in the hands of all workers in the field of smoking and its relation to respiratory diseases. It introduces important subjects which are outside the normal range of discussion by those working either in the laboratory or in the clinics. For example, the valuable chapters 3 and 4 describe the cultivation and subsequent treatment of tobacco, both of which profoundly influence the subsequent chemistry of the end product. Thus, as is now beginning to be recognized, the different end effects in man of prolonged smoking of cigar or cigarette tobaccos are related to the different curing methods of the two tobaccos; cigarette tobacco, the most harmful biologically, both in man and in rats, being flue-cured, while cigar tobacco, which is the least harmful, is air-dried.

Out of 700 pages, some 300, chapters 7 and 8, are devoted to tobacco smoke constituents and carcinogenesis. A reader, new to the subject, may well be struck by the exhaustive thoroughness of the work done on the carcinogens in tobacco smoke, which have been identified or which have been suspected, so that he may hesitate before entering this particular field himself. And yet it has taken us no further towards a solution of our problem other than to increase our doubts of this explanation.

Is it not high time that we question the whole idea of exogenous carcinogens as an explanation of the high incidence of lung cancer, and turn our attention to other possible explanations of our problems? There is no evidence to support the commonly held belief that lung cancer in smokers is the direct result of exogenous carcinogens, whereas there is the unexplained clinical paradox that, in those parts of the respiratory tracts which are exposed to the greatest concentration of tobacco smoke, such as the lips, jaws, mouth and tongue, cancer is on the decrease, while the "lungs", where the exposure is weakest, have been and still are presenting a fantastic increase in cancer incidence. Surely this argues against a direct carcinogenic action and suggests a far more complex situation, not necessarily associated with carcinogens, for which I have pleaded elsewhere[1].

On page 143 the authors direct attention to the curious phenomenon that in their laboratory the tumour yield from cigarette tar painted on mouse skin has fallen "markedly" in the past 10 years. Wynder *et al.*[2] published an experiment showing that out of 81 mice, 44·4 per cent presented skin carcinomata, suggesting that cigarette smoke condensate is highly carcinogenic. At the same time, in Great Britain some of us working with great care were only achieving something like 3 per cent to 5 per cent, indicating a low carcinogenicity. This divergence of results has never been properly understood in Great Britain. However, most recently, T. D. Day has supported us in his very thorough experiment, finding only 3 per cent of malignant skin tumours out of 7,875 mice[3]. I will not offer any explanation of this divergence of results, but it is fair comment to suggest that, if Wynder's first result had been 3 per cent to 5 per cent malignant tumours instead of 44·4 per cent, the whole experimental problem of lung cancer would have been approached more conservatively; the clinical approach, too, might well have been modified, and less attention might have been paid to the tobacco tars.

The authors provide a splendid selection of references, and, in the text, frequently express their own judgment of the value of some particular work, a practice which unfortunately is not always followed by other writers.