it must be borne in mind that the author himself is neither biologist nor toxicologist. Thus some minor points regarding such matters do not show an exactitude comparable to that displayed in his own subject. But the author can be applauded for commending the plant insecticides, since they are less toxic than the synthetic ones. They are especially worthy of recommendation for the control of insects of medical importance or other insects living in inhabited buildings. Considering the shortness of some other chapters, that on historical development is somewhat long. The subject index at the end of the book is very comprehensive and undoubtedly useful.

WD. EICHLER

A SCIENTIFIC ANALYSIS OF FIXATION AND DYEING

Principles of Biological Microtechnique

A Study of Fixation and Dyeing. By Dr. John R. Baker. Pp. 357. (London: Methuen and Co., Ltd.; New York: John Wiley and Sons, Inc., 1958.) 45*s*. net.

WHEN the reviewer began learning the basic techniques of cytology and histology, it was believed that fixing and staining were more an art than a science: with the same material, the same fixative and the same stain, very different results were obtained by good and bad cytologists. For some reason, still mysterious, Unna's methyl green-pyronine always stains nucleic acids properly in Brussels and refuses to do so in many experienced laboratories elsewhere. It is the great merit of Dr. John Baker, who has been deeply impressed by the great work of Ehrlich—to whose memory the book is dedicated—that he has shown that fixing and dyeing are based on sound scientific knowledge: his book contains no practical instructions on how to make a microscopical preparation, but emphasizes "the principle that when we make a microscopical preparation of any sort, we ought to try to understand what we are doing, for otherwise we shall examine an unknown object that has been treated in an unknown way".

Dr. Baker's book is divided into two main parts: fixation and dyeing. In the first chapter, which is an introduction to fixation, the author emphasizes the differences between a fixative and a preservative, a coagulant and a non-coagulant fixative; he then discusses the question of artefacts. The next chapter deals with the visible effects of the reaction of fixatives with proteins (precipitation, flocculation, single clot formation, gel formation, etc.). The chemical changes produced in these reactions are the subject of Chapter 3: coagulants (sublimate, chromium tetroxide, potassium dichromate, acetic acid) are examined in this respect, and the differences between additive and non-additive fixatives are stressed.

In Chapter 4, Dr. Baker examines the reaction of fixatives with tissues and cells, partly on the basis of model experiments made on gelatine – albumin mixtures. Shrinkage and swelling during fixing and embedding in various media are discussed. In Chapters 5 and 6, coagulants (ethanol, picric acid, mercuric chloride, chromium trioxide) and non-coagulants (formaldehyde, osmium tetroxide, potassium dichromate, acetic acid) are considered individually from many points of view (standard concentration for fixation, description, ionization, redox potential, manufacture, introduction as fixative, reactions with proteins, lipids and carbohydrates, rate of penetration, shrinkage or swelling, effects on cell constituents, on dyeing and on the histological picture). Finally, in Chapter 7, twenty-five aqueous and two non-aqueous fixative mixtures are described and discussed.

Chapter 8, an introduction to the chemical composition of dyes, opens Part 2: chromophores and auxochromes are discussed, and pararosaniline, basic fuchsine, leucobases, basic and acid dyes serve as examples. Dyes are classified in Chapter 9 according to their chemical composition, while Chapter 10 deals with the more complex problem of the direct attachment of dyes to tissues: the role of the electric charges on the dye ions and on the objects dyed is especially stressed; the basophil or acidophil character of cellular constituents, apparent isoelectric point of the cell, the effects of washing with water or alcohol, the nature of the fixative mixtures used, etc., are examined in great detail. The subject of the next chapter is, by contrast, the indirect attachment of dyes to tissues (use of mordants, formation of lakes, differentiation, mechanism of Gram staining).

In Chapter 12, Dr. Baker discusses the differential action of dyes: depth of coloration is affected by chemical affinity, density and permeability; nucleic acids and collagen are chosen as the main examples. Metachromasy is examined in the next chapter, the emphasis being placed on Lison's theory. Blood dyes (Ehrlich, Romanowsky, Giemsa) are discussed in Chapter 14, while the two next chapters deal with vital dyes. Finally, dyeing is compared with other processes of colouring in the last chapter: substances which dye cell constituents by dissolving in them are called 'lysochromes' (for example, sudan III in the case of lipids); the principles of silvering and the use of fluorochromes are briefly presented.

The book ends with an appendix, in which the author presents a number of model experiments on fixation and dyeing, as well as a few notes on spelling: for example, he insists on the use of basiphil rather than the usual terms basophil or basophilic. Dr. Baker is probably right there, but he is almost certainly fighting a losing battle: scientists, as a rule, do not care enough about grammatical correctness and etymology to give up words which are in general use and understood by all.

The book is well written and well presented; the many German and French quotations (the latter not always perfectly correct) and the historical approach remind us of the fact that Dr. Baker is a true scholar. There is no doubt that his book will be useful to all those who want to understand what they are doing when they handle cells or tissues with 'classical' histological techniques.

J. BRACHET

MASS SPECTROSCOPY

Nuclear Masses and their Determination

Proceedings of the Conference held in the Max-Planck-Institut für Chemie, Mainz, 10–12 July, 1956. Edited by Prof. H. Hintenberger. Pp. ix + 267. (London and New York: Pergamon Press, 1957.) 84*s*. net.

THE conference, the proceedings of which are recorded in this book, was held to mark the sixtieth birthday of Prof. J. Mattauch, of the Max Planck Institute. He has himself contributed much