

very fully treated. Verbatim extracts of the leading judgments on each important topic have been quoted, and the author has not hesitated to criticize many of the decisions of the court. As he points out in his frankly written preface, "It is inevitable that in some cases a Court, approaching a problem of patent law for the first time, has come to a decision which seems erroneous to the specialist who has over a period of years reached a different conclusion, possibly through giving more weight to expediency in practice than to abstract rules of construction or the dictionary meaning of words. Such decisions have been frankly criticized in the following pages". It will be undoubtedly helpful to many a practitioner to have these critical and constructive comments.

In the contents are set out the principal changes enacted by the Patents Act 1949, many of which are likely to make the law more favourable to inventors who patent their inventions. New methods of processing or testing applicable to the improvement or control of manufacture are now patentable. New chemical substances may be patented *per se*, without reference to any particular method of manufacture, and this constitutes a substantial change in the law which is of importance in the chemical industry. Patents of addition are no longer to be invalidated by publication of the main patent or user of the invention which is described in it. Thus an opportunity is now afforded to a patentee to file a fresh application for letters patent covering details of his invention in the light of actual experience. This is likely to avoid the patentee being deprived in future of a chance of obtaining an effective monopoly for his invention.

The book commences with a brief history of the development of patents and the nature of patentable inventions. Next follows a chapter on the applicant and the application, including a valuable résumé of the difficult question which so frequently arises in practice—the extent of the ownership by an employee of an invention conceived while in the employment of a firm. The requirements laid down by the Act as to the contents of the specification and the grounds upon which the specification may be attacked before and after the grant of letters patent are set out in the succeeding chapters. The chapter on the action for infringement, the method by which a patentee in the last resort can enforce his patent privileges, contains an excellent summary of the principal matters to be considered and a review of the more important cases. The sections of the Act dealing with action which can be taken to deal with any abuse of the monopoly granted by way of patents are fully analysed. Now that government departments are so closely connected with industrial research, the sections of the Act dealing with questions of compensation payable by the Crown in respect of use of patented inventions are of considerable practical importance. These questions have been clarified by the new Act and are carefully summarized. No mention, however, is made of the facilities whereby a patentee may in certain circumstances have his claim dealt with by the Royal Commission on Awards to Inventors set up under the chairmanship of Lord Cohen.

While retaining the general layout of the former editions of this standard text-book, this new edition provides a more compact and logical approach to a difficult subject than did its predecessors. The book will be welcomed by all who are in any way concerned with inventions and patents.

R. G. LLOYD

A HANDBOOK OF PAPER CHROMATOGRAPHY

Papierchromatographie

Von Dr. Friedrich Cramer. (Monographien zu *Angewandte Chemie* und *Chemie-Ingenieur-Technik*, Nr. 64.) Pp. 81+2 plates. (Weinheim-Bergstr.: Verlag Chemie, G.m.b.H., 1952.) 9.80 D. marks.

OF all forms of chromatography, the paper chromatogram has proved the most popular and is now universally established. Since its inception in 1944, many articles have appeared reviewing its applications; but while these have served a useful purpose, the time has come for something more permanent than a review, and which brings together all the important features and is designed to be a work of reference. This has been accomplished by Dr. F. Cramer in "Papierchromatographie".

The monograph is arranged in two parts, general and special. The first gives the principles underlying the different types of chromatogram. Counter-current distribution is discussed and linked up with partition chromatography. The paper chromatogram is discussed as a partition process, and the arguments against it are also presented. After the theoretical sections, there follows a full and detailed account of the practical aspects of paper chromatography. An outline of the various methods of quantitative analyses is next presented, and then the use of paper, either in sheet or powder form, for isolations. Though not strictly chromatography, paper electrophoresis is usefully included, and this completes the general part.

The special part of the book is concerned with applications to all the important classes—amino-acids, sugars, purines, and so on. The treatment is thorough; many tables of R_F values are given, and full details are provided of solvents, reagents, and some of the more important quantitative methods. Non-aqueous and reversed-phase chromatography and the use of radioactive tracers are not overlooked. The emphasis throughout is on sheet chromatograms; the use of paper and starch in columns is mentioned only briefly.

In a work of this kind, so packed with information, it is perhaps inevitable that errors and omissions occur, but these are remarkably few. The only serious criticism that one can offer is that there is no subject index, which is essential in such a work of reference. Of the few errors, there are one or two references which do not relate to the subject-matter in the text. Of the omissions, there is no reference to Durrum's important contributions on paper electrophoresis¹. In the section on peptides, which is rather too brief, more could have been said about the techniques for determining the order of amino-acid residues in proteins and polypeptides, and a table of R_F values of peptides and derivatives might have been included. There is no mention of the theories relating R_F values of peptides with the thermodynamics of their structure². A 'map' of the amino-acid spots of a two-dimensional chromatogram would have been useful. Though the illustrations are clear and the colour photographs are good, it is rather a pity that a better two-dimensional chromatogram was not chosen for reproduction.

However, these are small blemishes in a work which provides all the information that one expects from a good text-book. It is up to date, well arranged, generously illustrated and clearly printed on high-quality paper. The price, at present rates of exchange,

is reasonable, and it is to be hoped that the book will be generally available outside Germany. Is it too much to ask for the monograph to be supplied in stiff covers? This would, of course, raise the price somewhat, but would be worth while as a protection against inevitable wear and tear. An English translation would undoubtedly widen its appeal. This book will be found invaluable by all, whether experienced or not in the subject, and Dr. Cramer and the publishers are to be congratulated on the production of an attractive text-book of outstanding importance.

R. CONSDEN

¹ Durrum, E. L., *J. Amer. Chem. Soc.*, **72**, 2943 (1950).

² Martin, A. J. P., *Biochem. Soc. Sym.*, **3**, 4 (1949).

ARCHAEOLOGY IN ECUADOR

The Archaeology of the Santa Elena Peninsula in South-west Ecuador

By G. H. S. Bushnell. (Occasional Publications of the Cambridge University Museum of Archaeology and Ethnology.) Pp. xv+155+5 plates. (Cambridge: At the University Press, 1951.) 42s. net.

THIS volume presents the results of Dr. G. H. S. Bushnell's field-work in an area until now practically unknown archaeologically, together with a discussion of the small corpus of relevant comparative material, mainly the work of Spanish archaeologists.

Dr. Bushnell's excavations indicate the presence on the Santa Elena Peninsula of three separate cultures: Guangala, Engoroy and Manteño. They were nowhere found in stratification, but there is some evidence indicating this sequence. Manteño, previously known from Manabí as probably the last period before the Spanish Conquest, the author considers to be intrusive in the Peninsula. He is rightly cautious about dating, but produces some comparative material suggesting that Guangala, the earliest found, is later than A.D. 900.

Detailed descriptions of these three cultures are given. There is also a brief chapter on a possible pre-Guangala culture (now being further investigated by E. N. Ferdon, jun.), and another on an early post-Conquest cemetery at La Libertad, partly excavated by the author.

Besides much characteristic pottery, sites belonging to all three cultures yielded tools of stone and shell. In Guangala and Manteño sites metal tools and ornaments were found; the single Engoroy site produced no metal. Among Manteño objects were two celts. That these at least were of local manufacture is indicated by the close correspondence of one of them to a clay mould excavated at La Libertad by Mr. A. J. R. Murray in 1923-24 (now in the Pitt Rivers Museum, Oxford). A metallurgical report by the British Non-ferrous Metals Research Association on some of the metal objects (Appendix A) shows them to be of copper and not of bronze.

Most of the human remains were either calcined or in very poor condition. In Appendix B, Dr. W. L. H. Duckworth reports on the seven skulls of the Guangala period which were capable of preservation. They show artificial deformation at the occiput such as is characteristic of Peruvian skulls, which they resemble in other details also.

In culture, however, Dr. Bushnell thinks that the Guangala period may prove to owe more to Central America than to Peru. For Engoroy he can suggest

no outside relationship. He agrees with the view held by Saville from his work at Manabí that the Manteño culture shows "a considerable degree of independence of outside influence".

Although many problems remain unsolved, Dr. Bushnell's work has put into place a piece of the jig-saw puzzle which will eventually be completed to produce a picture of the archaeology of coastal Ecuador. The book is well illustrated, with maps and plans, numerous line-drawings, photographs, and an excellent colour plate of Guangala pottery types. It should give a good start to the welcome new series which it inaugurates.

B. M. BLACKWOOD

PHYSIOLOGY OF MITOSIS

The Mitotic Cycle

The Cytoplasm and Nucleus during Interphase and Mitosis. By Dr. Arthur Hughes. Pp. viii+232+16 plates. (London: Butterworths Scientific Publications, Ltd., 1952.) 35s. net.

IT is rightly emphasized on the dust-cover of this valuable monograph that the process of cell division presents one of the most difficult problems the experimental biologist has yet attempted to solve, and, if this present account of the mitotic cycle is not an easily flowing and well-balanced narrative, the reflexion is not on the author but on the present state of our knowledge of the subject. There is a large and widely scattered literature of unequal relevance and of uneven quality. The lines of advance have been largely dictated by considerations of the materials and techniques available, and a strong medical bias is also evident. Thus we now have an extensive knowledge of the early cleavage of a certain few eggs, of the growth in culture media of a certain few tissues, of the methods of induction of cancerous growths, and of the methods of mitotic inhibition by a multitude of diverse substances. The obvious questions posed by the mitotic activity of normal animal and plant tissues have been almost entirely neglected, although very recently a start has been made towards their solution.

The book gives an extensive survey of this patchy subject, and it will for many years remain a valuable tool in the hands of those who are working in or around this field of research. Chapters are devoted in turn to the nucleic acids, to the cytoplasm and nucleus in interphase and in division, and to the experimental methods of analysis of the problems presented. Sections are contributed by Dr. M. M. Swann on the spindle, and by Dr. C. Waymouth on the nature of the stimulus to mitosis.

Because this is such an extensive review, the few gaps that are left unfilled appear all the more obvious. In particular, it has to be noted that the short section on hormones and mitosis gives a surprisingly inadequate account of our present fairly extensive knowledge. Another lesser criticism which may also be offered is that the long reference lists are arranged in order of mention and not, as is more customary in biological works, in alphabetical order. This is particularly regrettable, since these lists are one of the most valuable features of the book.

Such criticisms do not, however, invalidate the final judgment that this is certainly the best review of the difficult subject of cell division yet to be published, and its appearance will be warmly welcomed.

W. S. BULLOUGH