

REVIEWS.

FORENSIC CHEMISTRY. By A. LUCAS. Pp. vii.+268. (London: Edward Arnold and Co. 1921.) Price 15s. net.

The author is to be congratulated on having written a book which supplies many of the deficiencies of the standard text-books on Forensic Medicine and Toxicology. The title of his book "Forensic Chemistry" is, however, somewhat misleading since it suggests that the work deals mainly with chemistry. In point of fact microscopy, physical investigations, and investigations requiring the use of common sense and general scientific knowledge, which one might describe under the terms of "Scientific Detective Investigations," occupy a large portion of the book. These are of especial value since many of them are not dealt with in any other book.

The introductory chapter contains some very sound advice to those engaged in the scientific investigation connected with legal cases, and lays stress upon the careful details as to the mode of work and recording of everything that is done so that precise details may be given in the witness box. The advice as to the giving of evidence is sound and is obviously based on practical personal experience.

One of the best chapters in the book is that on blood stains, and the author acknowledges the help received from Mr. W. M. Colles, of the Ministry of Justice, Cairo, who also collaborated in the chapter on poisons. The various tests described for blood and their details are of great practical value; many useful helps in technique are given, and there is a good account of the biological test together with the modifications which are found necessary in a tropical climate. The chapters on bullet and other projectiles for firearms, clothing, counterfeit coins, firearms, explosives and explosions all contain interesting and useful information. One of the most interesting chapters is that on documents, which records most valuable information concerning the detailed examination of the material of a document, the various kinds of ink, visible and invisible, and the changes which occur with age. The whole of this chapter shows that the writer is speaking from a very extensive practical experience.

The chapter on poisons is a brief one, since the author aims at avoiding repetition of material to be found in other books. It would perhaps be advisable if in a future edition this chapter were somewhat extended. The method advised of taking samples for analysis is scarcely applicable to this country, since it is stated that strong spirit, either plain or methylated, should be added as a preservative in every case. In a tropical country this may be necessary, but in temperate countries it is most desirable that no preservative of any kind be added to viscera which are to be analysed for poison; there is always risk of the preservative containing poisonous substances, and the difficulties of analysis may be much increased in this way. It is stated that a generous supply of viscera should be sent for analysis in fatal cases and the quantities required of liver, kidney and intestines are given. In cases of suspected fatal poisoning it is most desirable that all the viscera be sent for analysis, since by this means a much more accurate estimation of the total amount of poison present in the body can be obtained. There is no mention made of the necessity for taking portions of the hair, nails, and muscle in arsenical poisoning. In cases where the question of acute or chronic poisoning by arsenic may arise, it is necessary that an analyst should be furnished with these materials. In the case of veronal poisoning further details might with advantage be given as to the methods of isolating and purifying this substance.

An interesting chapter is given on preservation of the human body, and this is based on a number of original observations made on dead bodies in Egypt at various periods after death.

This book on forensic chemistry forms a really valuable addition to the existing text-books on medico-legal investigations, and everyone engaged in that kind of work will be wise in providing himself with a copy. The volume should find a place in every scientific library and analytical laboratory.

W. H. WILLCOX.

THE SILVER BROMIDE GRAIN OF PHOTOGRAPHIC EMULSIONS. By A. P. H. TRIVELLI and S. E. SHEPPARD. *Monographs on the Theory of Photography from the Research Laboratory of the Eastman Kodak Co.* Edited by C. E. K. MEES and M. S. SCHRAMON. Pp. 143. (New York: D. Van Nostrand Co. 1921.)

More than twenty years have elapsed since it was first noticed that the fundamental units of photographic "emulsions" are small grains of silver halide embedded in the gelatin of the film, and during this period much research work has been done to discover more about these grains. It is therefore somewhat surprising that this monograph, the first of a series on the theory of photography, is the first book on this subject in the English language. Although it is intended to cover the whole of the literature of the subject—and to aid in this purpose numerous references are given and a complete bibliography appended—the greater part deals with original work carried out in the Kodak laboratories and not previously published.

In the early chapters factors determining the "ripening" of emulsions are considered. A new theory is put forward to explain the so-called "ammonia development" of exposed plates; the authors have shown that this is a development not of the latent, but of the visible image, produced by the recrystallisation of silver halide-ammonia compounds on nuclei furnished by the exposure.

The bearing of von Weimarn's theory of precipitation on the dispersity of silver precipitates is then considered. One would have expected that the authors would have given a more lucid account of the theory; they give the average reader credit for a better knowledge of this than he might be expected to have, and matters are not simplified by the rash manner in which symbols are employed without definite indication of their significance. However, in spite of this, in the chapters dealing with the application of von Weimarn's work to the more complicated processes of ripening in the presence of colloids, solubilising agents and other additions, the theory is applied in an exceedingly interesting manner, and leads naturally to the consideration of the phenomena of crystallisation and of the forms of the crystals finally resulting. The catalysis of crystallisation and the effect of capillarity on crystal growth receive attention, the latter having been extensively investigated both theoretically and practically.

The second portion of the book deals with the experimental study of the crystallisation of silver bromide, and this section of the work is considerably less involved and more likely to appeal to the practical man. It is illustrated with reproductions of a large number of photomicrographs, both of actual photographic emulsions and of silver-bromide crystals grown under carefully controlled conditions. Many of these exhibit the most diverse forms, and some, notably those taken with polarised light, are excellent examples of photomicrographic work of a high order. For an exhaustive investigation of the crystallography of silver bromide the specially grown crystals were used, and the directions of most rapid growth of the crystals determined, an explanation thus being afforded of the

various kinds of the crystal which occur in the emulsions of commerce.

The monograph concludes with a consideration of the use of polarised light in the investigations and a summary of the results of crystallographic study. Although in places there is a notable lack of the lucidity desirable in the treatment of somewhat involved theories, on the whole the arrangement is good and the work should serve admirably the purpose for which it is intended.

G. I. HIGSON.

THE ANALYSIS OF COAL AND ITS BY-PRODUCTS. *By S. ROY ILLINGWORTH, assisted by J. GRIFFITHS. Pp. 380, with 63 figs. in text. (London: The Colliery Guardian Co., Ltd. 1921.) Price 21s.*

The publication recently of several books dealing with the analysis of coal and its by-products is a healthy symptom of awakened interest in the subject of the scientific use of coal. No better exponent of the subject could be desired than Mr. Illingworth, whose scientific work on the carbonisation of coal is well known and admired and whose practical experience is wide. The latter fact becomes self-evident from a perusal of the work now under review, wherein are described, with a wealth of practical detail, those methods of analysis and examination of coal which, presumably, its author has found most reliable. Many of the details of the methods described with such care have been worked out by the author, who has also devised apparatus which enables results of such routine determinations as "moisture" and "ash" in coal, to be obtained rapidly and with sufficient accuracy.

Alternative methods of analysis are frequently given. In this connexion it is, perhaps, unfortunate that the reader should sometimes be left in doubt as to which method the author regards as the more satisfactory. However, if such vagueness stimulates analysts to make investigations for themselves (and to place the results on record) rather than blindly to follow Mr. Illingworth's advice, it will help to realise the ambition expressed in his preface that the methods described should "furnish a nucleus around which there is subsequently crystallised a more scientific control of the winning, sale and use of coal and its products."

As already indicated, a striking feature of the book, and that which must render it a boon to the busy analyst and a godsend to the lazy-minded, is the care and clarity with which even the simplest operations are described. For this reason occasional lapses are the more noticeable; for example, the estimation of moisture in coal is recommended to be made in a copper-jacketed water-oven fitted for use under a vacuum (p. 15), but when the method is described (p. 16) it is not stated whether a vacuum is, in fact, to be used or whether a current of air is to be created, as when mine dusts are analysed (p. 359); incidentally, information as to how to render the door of this oven airtight would be welcome. There are a few similar deficiencies, but the only inaccurate statement, apart from obvious misprints, noticed is that regarding the estimation of benzene and olefines in gas analysis (p. 268), which recommends the use of fuming instead of ordinary sulphuric acid (sp. gr. 1.81) as an absorbent for benzene vapour.

As well as descriptions of analytical methods, the book contains a chapter (Chapter I.) on the sampling of coal, the importance of which is rightly emphasised; and one (Chapter XV.) on the resolution of coal into various components by means of solvents—a subject of which Mr. Illingworth has made a special study; altogether it is a valuable addition to the literature of fuel. It has the merit, also, of being well printed and produced.

R. V. WHEELER.

OBITUARY.

H. INGLE.

Dr. Harry Ingle, who died on December 4, 1921, was educated at the Leeds Middle Class School, and at the Yorkshire College where he graduated with first-class honours in chemistry and gained the Le Blanc medal for technical chemistry. He was the first Doctor of Science of Leeds University and the first graduate of that University to obtain an 1851 Exhibition Scholarship, with the aid of which he studied under von Bayer and Thiele in Munich. Returning to this country with the degree of Ph.D., he served successively as honorary demonstrator in organic chemistry in the University of Leeds and head of the chemical department in the Technical School, Hull. His next post was chemist to Messrs. Barry Ostlere and Co., linoleum manufacturers, of Kirkecaldy, and latterly he carried on a consulting practice in Leeds.

Ingle contributed eleven communications to this Society, of which five were read before the Scottish Section (1902-08), and six to the Yorkshire Section (1912-19); the majority of these related to the chemistry of oils, and in particular to their oxidation. He was a regular attendant at the meetings of the Yorkshire Section and served upon its committee from 1917 to 1919.

PUBLICATIONS RECEIVED.

THE MANUFACTURE OF CANE SUGAR. *By J. JONES and F. J. SCARD. Second edition, revised. Pp. 481. (London: Duckworth and Co. 1922.) Price 25s.*

SOAPS AND PROTEINS: THEIR COLLOID CHEMISTRY IN THEORY AND PRACTICE. *By DR. M. H. FISCHER, with Drs. G. D. McLAUGHLIN and M. A. HOOKER. Pp. 272. (New York: John Wiley and Sons, Inc.; London: Chapman and Hall, Ltd. 1921.) Price 24s.*

DIE METHODEN DER ORGANISCHEN CHEMIE (WEYL'S METHODEN). General Part. Vol. I. Edited by Prof. J. HOUBEN and associates. Second revised and enlarged edition. Pp. 1121. (Leipzig: Georg Thieme. 1921.) Price, paper, 700 mk., bound 800 mk.

NACHWEIS, ISOLIERUNG, ABBAU- UND AUFBAUSTUDIEN AUF DEM GEBIETE DER GERBSTOFFE. *By K. FREUDENBERG. ISOLIERUNG, NACHWEIS UND AUFBAUSTUDIEN AUF DEM GEBIETE DER GERBSTOFFE.* *By E. SIEBURG. Handbuch der Biologischen Arbeitsmethoden. Edited by Prof. E. ABDERHALDEN. Section I. Chemische Methoden., Pt. 10, Vol. II. Pp. 439-584. (Vienna: Urban und Schwarzenberg. 1921.) Price, paper, 78 marks.*

BULLETIN OF THE IMPERIAL INSTITUTE. Vol. XLV., No. 3, 1921. Pp. 271-446. (London: John Murray. 1921.) Price 3s. 6d.

THE PRODUCTION OF COAL AND COKE IN CANADA DURING 1920. *Canada Department of Mines. Mines Branch. Pp. 36. (Ottawa: P. A. Acland. 1921.)*

PUBLICATIONS OF THE MINES BRANCH, CANADA. Department of Mines. (Ottawa: Government Printing Bureau. 1921):—

THE PREPARATION, TRANSPORTATION, AND COMBUSTION OF POWDERED COAL. *By J. BLAZARD. GAS-PRODUCER TRIALS WITH ALBERTA COALS.* *By J. BLAZARD and E. S. MALLOCH.*