

of Takata, the experiments of Takata were repeated on a very large scale by the author and his co-workers during the period from autumn 1950 to spring 1952. The original Takata technique was considerably improved by the introduction of a new and more sensitive method of detecting the initial flocculation. Conductivity measurements were made instead of visual observation of the appearance of the flocculae, used by Takata. After having eliminated some preliminary sources of error, no "cosmoterrestrial Takata effect" could be found at all in more than 100 sunrise experiments despite the fact that decidedly more sensitive measurements were made than had been made by Takata. Also another effect described by Takata, the influence of electrically charging the person from whom the blood was to be taken on the protein liability, could in no way be verified, although, once again the sensitivity of measurement was higher than in Takata's experiments. Other properties of the human blood were experimentally investigated; namely, the pH value of the streaming blood, the blood cell sedimentation constant, the prothrombin amount of the blood and the albumin/globulin ratio of the blood (by electrophoresis). In no experiment was it possible to detect, in even the slightest degree, an effect of the sunrise. Finally, an experiment was performed to

determine whether a slight change in the electrical charge of an insulated human being could be detected, by direct electrical measurements, during the sunrise. No such effect was present. All these experiments, performed with high precision, having produced only negative results so far as the effect of sunrise is concerned, support the conclusion that the "cosmoterrestrial Takata effect" is not present at all. The results of Takata and Murasugi were caused by either systematic errors or psychological illusions involved in the original, rather inaccurate, technique of Takata.

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CORRECTION: In the paper by Evans that appeared on page 718, *SCIENCE*, June 26, the spelling of "Bromsulfalein" should be corrected to read "Bromosulfalein," which is the chemical name of a dye that can also be obtained commercially under the capitalized trade-mark "Bromsulphalein." Correct identification of the substance is important in all discussions of its use, including the recent one.

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Book Reviews

Crime Investigation: Physical Evidence and the Police Laboratory. Paul L. Kirk. New York-London: Interscience, 1953. 784 pp. Illus. \$10.00.

Dr. Kirk's avowed intention that this book should serve the "needs of police investigators, general criminalists in the small police laboratories, and students of criminalistics and police science" appears to be too broad. The needs of these groups are not identical or even nearly so. The police investigator is by far the largest of the three groups and is in itself a "specialty" not closely allied to the worker in the small laboratory or the student.

It is not believed that the book has strong appeal for the investigator whose requirements are best served by acquainting him with the possibilities that scientific evidence has to offer. It may be assumed that a more detailed listing of the scientific possibilities never hurts him, but it should be noted that memory is a fickle matter and people tend to remember "wholes" in reference to parts. Too much emphasis on the "parts" in learning often results in a lack of recognition of the "wholes." This, in my opinion, is the error of this book as applied to the "needs of the investigator."

There are many statements that will meet with disagreement by other workers in the field. Such statements and, in some cases, implications might lead the reader to believe that the uncommon becomes the routine. The author states that

From an examination of a glove found at the scene, the following inferences were drawn: (a) The culprit was a laborer associated with building construction. (b) His main occupation was pushing a wheelbarrow. (c) He lived outside the town proper on a small farm or garden plot. (d) He was a southern European. (e) He raised chickens and kept a cow or horse.

The untrained reader may conclude from the above that such inferential reasoning should persist in all cases, and when the police laboratory fails to provide a full description of the criminal in all instances, regardless of the evidence submitted, confidence in scientific crime investigation falters. In criminal investigation, the identification and examination of blood stains is important but usually difficult because of contamination and other factors. Yet the author suggests that "Examination of blood stains may yield information on the presence or absence of syphilis in the donor." Inclusion of the phrase "in the donor" implies fresh liquid blood. The determination of syphilis in fresh blood specimens is a routine examination, but since the heading is "Blood Stains," we presume the author implies that syphilis can be detected from an examination of the stain. Serologists with whom I have discussed the feasibility of testing blood stains for syphilitic bodies hold no claim for positive accuracy. In this procedure, in fact, they all advise against such examinations.

Such points of controversy can be easily recognized

by the specialist, but those not specialized will labor under misapprehension until they learn by experience.

The worker in the small laboratory and the student may well profit from the treatment given in this book to the wide variety of scientific methods that may be applied in criminal work. These groups, however, will have the time necessary to evaluate the suggested techniques and recognize the limitations inherent in such instances, such as the educational background necessary and the amount of practical experience required to arrive at the logical conclusion in a given method.

Persons more experienced and more learned in the field of scientific criminal investigation will take a more kindly view of this book. Such must be the case as evidenced by the fact that New York University Graduate School of Public Administration and Social Service conducted an institute on "Modern Methods in Law Enforcement" on August 3-7, and selected this book as the textbook for the course.

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Marine Fouling and Its Prevention. Prepared for the Bureau of Ships, Navy Department, by the Woods Hole Oceanographic Institution. Annapolis, Md.: U. S. Naval Institute, 1952. 388 pp. Illus. \$10.00.

This compilation is the outgrowth of the fouling investigations conducted by the Woods Hole Oceanographic Institution during the years 1940-46. It is both an introduction to an important aspect of marine ecology and a manual of antifouling techniques and materials.

Most of the book is designed for the use of naval and shipping interests, and the biological discussions are intentionally elementary, to be consulted by laymen, with one important exception. This is Chapter 10, "intended for the professional biologist and may have little interest to others." Although the professional biologist will consider most of the introductory chapters excellent essays in what might be called semi-popularization, this chapter intended for him has some serious defects. The key to the chapter is its 30-page appendix, a "list of species recorded from fouling." It appears to be a first approximation in several respects; eight categories, for example, have been compiled from single references and half a dozen more from only two or three sources. Granted that most of the categories so treated are groups of minor importance, nevertheless this list is used as the basis for several tables summarizing the distribution and types of organisms involved in fouling. Another defect of this master list is that several important groups are composed in large part of species drawn from unpublished sources and in several cases the determinations were made by individuals without published papers in these systematic groups. In almost every group, a specialist may be able to offer

additional species overlooked by the compiler of this list or point out duplications. This is extreme in the case of the anemones, where 12 species and varieties are listed although there are only 5 fully recognizable species (5 of the names are easily equated to 2 species by inspection). Nevertheless the 12 different names are carried into the summary tables as full species.

For the biologist, at least, one of the most useful chapters in this book is Chapter 5, "The Seasonal Sequence," summarizing by graphs the temperatures, periods of settling, and quantitative aspects of fouling in various parts of the world. The second half of the book is given over to methods of fouling prevention and control, starting with a short history of the subject and including a list of British, German and U. S. patents issued for antifouling compounds and devices. The emphasis throughout this section is on the protection of surfaces; the most adequate discussion of fouling control in salt water systems is to be found in the first chapter. The use of double systems in industrial plants or aquaria is not mentioned.

The book is well printed and illustrated; the large page size makes the volume comparable to an ordinary octavo of perhaps more than 500 pages.

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Wood Chemistry, Vols. 1 and 2. 2nd ed. American Chemical Society Monograph Series. Louis E. Wise and Edwin C. Jahn, Eds. New York: Reinhold, 1952. Vol. 1, 688 pp., illus.; Vol. 2, 652 pp., illus. \$15.00 the volume.

General interest in wood chemistry has grown rapidly in recent years because of increased demands for wood pulp and because of greater fundamental interest and industrial curiosity regarding the numerous non-cellulose components of wood. For all persons interested in wood chemistry the new edition of *Wood Chemistry* will be of great value. It is a complete and extensive revision of the work first published in 1946. Because of the amount of material presented, the second edition is in two volumes.

Volume I is divided into three parts, each with its complement of chapters written by established research men. Part I, "Growth, Anatomy and Physical Properties of Wood" contains chapters by H. P. Brown and C. C. Forsaith. Here is described the general morphology of soft and hard woods from the biological viewpoint, but with notations as to the location of chemical compounds. Tensile and compressive strengths of woods are treated in relation to such factors as structure, moisture, and the presence of the various chemical substances.

Part II, "Components and Chemistry of the Cell Wall" contains chapters by W. M. Harlow, L. E. Wise, H. Mark, C. B. Purves, A. J. Stamm, E. C. Jahn, and F. E. Brauns. This part deals with the chemical composition of wood cells and middle lamella, and the physical and chemically modified