Comments and Communications

Preparation of the Phosphatase Reagent Disodium *p*-Nitrophenyl Phosphate

Bessey and Love (*1*) have recently described a method for the preparation of the disodium salt of *p*-nitrophenyl phosphate which has the advantage of giving a better yield of the salt than the method of Ohmori (*2*). To obtain an essentially pure product, Bessey and Love recommend recrystallization from boiling 87% alcohol and drying over P_2O_5, stating that the preparation becomes yellower with time.

During the development and use of a sensitive method of testing the efficiency of milk pasteurization (*3*), we have gained much experience of this substrate which, for the differentiation of the small amounts of residual phosphatase left in heat-treated milk, must be of a high degree of purity and substantially free of yellow color.

It has been found difficult to obtain colorless crystals of the *p*-nitrophenyl phosphate by methods involving the use of *hot* solvents, such as the recrystallization from boiling 87% alcohol or the precipitation with acetone from solutions in hot aqueous methanol as recommended by Axelrod (*4*). Pure white crystals are more easily obtained by the following modification of Axelrod's purification procedure. The crude disodium salt is dissolved in *cold* 90% methanol at the rate of about 20 ml/g, and an equal volume of acetone is added to the filtered solution. The crystals are filtered off and washed with a volume of acetone equal to that originally added. A second crop of crystals is obtained from the mixture of filtrate and washings. The crystals are spread on filter paper and air-dried.

Disodium *p*-nitrophenyl phosphate crystallizes with 2 molecules of H_2O. It loses this water quite easily, and any loss causes yellowing of the crystals. Actual desiccation should, therefore, be avoided and air-drying of the ether or acetone washed crystals should be considered the method of choice. During and after drying the crystals should be protected from strong light, as this is also detrimental.

In well-stoppered containers, colorless air-dried preparations have been kept in an ice box for several years without visible discoloration. Even at room temperature, little deterioration has been observed after storage for several months, provided that care has been taken to prevent any access of light.

R. ASCHAFFENBURG

National Institute for Research in Dairying
University of Reading
England

References

1. BESSEY, O. A., and LOVE, R. H. *J. Biol. Chem.*, **196**, 175 (1952).
2. OHMORI, Y. *Enzymologia*, **4**, 217 (1937).
3. ASCHAFFENBURG, R., and MULLEN, J. E. C. *J. Dairy Research*, **16**, 58 (1949).
4. AXELROD, B. *J. Biol. Chem.*, **167**, 57 (1947).

Documentation

THE paper by Raimon L. Beard *et al.* on documentation (SCIENCE, **116**, 553 [1952]) was read with particular interest. The collecting, classifying, coding and indexing of scientific and technical literature has become so large an undertaking nowadays that it is frightening to think what it will be like in even 10 or 20 years. The only answer lies in some mechanical means of recording this enormous wealth of knowledge. But in the first place this information must be put on to a card, tape, disc, or film and that means a human indexer, since no machine can yet read and understand a scientific paper in a journal.

Dr. Beard's remarks about abstracting journals that ". . . indexing is based on the titles or abstracts, not on the original contribution . . ." is not true of all these journals. Nor is the indexing of the original paper beyond the scope of the abstracting services as he claims it is. Through lack of funds, inadequate support or staffing problems, it is necessary in some organizations to index from an abstract; probably no editor or abstractor will agree that such index entries are as good as those prepared from the original paper.

The ideal index entries must surely be prepared by the individual with a specialist knowledge of the subject matter of the paper, who has read it, written the abstract and is therefore in the best position to know the units and sub-units of thought in the original. This demands a new approach to documentation in that it is the specialist (not an indexer) who does the work of abstracting and indexing, and can thus bring his expert knowledge to bear on both the subject matter for the abstract and the right subject index entries.

This system is not just a hypothetical ideal: it has been in practice very successfully in several centres, and in particular with *Dairy Science Abstracts*. The human indexer who is primarily a specialist is best able to put the proper entries into an index, be it card, tape, disc or film.

A. W. MARSDEN

Commnowealth Bureau of Dairy Science
Shinfield, Reading, England

REGARDING our paper on documentation (SCIENCE, **116**, 553 [1952]), such generalities as referred to by Dr. Marsden inevitably lead to exceptions. The abstracting and indexing services merit the highest praise, and the exceptional ones deserve special recognition and encouragement in their efforts to perform an increasingly difficult function.

With the assurance of Dr. Marsden that indexes to abstracts can be prepared in such a way that the important casual observation, incidental to the main theme of a paper, gets recognition, the facilities being tested by the Chemical-Biological Coordination Center offer no advantages over the more conventional ap-

proach—insofar as an indexing system alone is concerned. To this extent, both efforts follow the "growing trend in documentation toward considering units of thought as fundamental . . ." to quote from our paper.

Although the CBCC also calls for specialists to catalog units of thought, the real novelty of its methods lies in the medium of handling the units of thought in such a way that they can be searched from many different points of view, with wide choice as to degree of selectivity, and in simple or complex combinations not possible by any other existing scheme.

RAIMON L. BEARD
KARL F. HEUMANN
Connecticut Agricultural Experiment Station
New Haven, and
National Research Council
Washington, D. C.

Book Reviews

Geology. O. D. von Engeln and Kenneth E. Caster. New York–London: McGraw-Hill, 1952. 730 pp. Illus. $7.00.

Another in the series of new textbooks in the field of general geology, this book combines the talent of a well-known physical geologist of senior citizenry and the efforts of a paleontologist of established position. The new text, of pleasing appearance, attempts an integration of physical and historical geology into a single unit by interrelated chapters stressing principles of both subjects simultaneously, and avoiding either the artificial separation of physical from historical that is sometimes found, or the repetition necessary in two separate treatments. Throughout, as ideas are presented, relationships to paleontologic and stratigraphic principles are explained.

The text is organized in what is probably correctly termed "the conventional approach." Major headings are (1) "Introduction to Geology," 3 chapters; (2) "The Natural History of Igneous Rocks," 6 chapters; (3) and "Structure, Process, Forms," 13 chapters, which completes the section devoted primarily to physical geology (52% of the 706 pp.). "Geologic History" follows time-scale subdivisions beginning with "Cenozoic Era," 4 chapters; "Mesozoic Era," 3 chapters; "Paleozoic Era," 7 chapters; and "Cryptozoic Eon," 3 chapters. Transition from physical to historical geology is accomplished by closing physical with glaciation, and opening historical with the Pleistocene glacial epoch. It will be interesting to discover, as usage of this text progresses, if the technique of newest to oldest in chronology of historical geology takes any better today than it did in earlier texts similarly constructed.

Few geologists will disagree with the writers that "A basic text in geology should present the subject so as to afford the student . . . inspirational satisfaction," or with their position that the text should also provide a "comprehensive survey of the science to furnish an adequate sound foundation for the advanced courses that comprise the training of the professional geologists." That these two important objectives can be effectively met in the same textbook is an open question. The numerous texts that have appeared in the past 10 years, with only one exception so far as this reviewer is aware, have attempted by monotonously similar techniques to accomplish these objectives. The adding of new texts scarcely seems justified, no matter how sincerely conceived, unless unusual new approaches can be introduced to reach the varied objectives customarily attempted.

The illustrations are well placed and the diagrams attractive.[1] Many are new and original with this book. Some are not as effective as they might be were printing contrasts greater.

The vocabulary of geology is emphasized throughout. Questions for review found at regular intervals whose purpose is defined as permitting "the student to know just what is expected of him in . . . comprehension . . . (and serving) . . . the teacher . . . for tests" could, in this reviewer's opinion, be more imaginative and more commanding of the interrelationships of geological principles, rather than the fact mastery.

Emphasis is placed on reducing the special difficulty of mastering a multitude of technical terms, and it is asserted that "to facilitate attainment of . . . proficiency the explanation of each technical term appears where it is first used." This objective is reached in text, but it would appear that little thought was given when illustrations were inserted, since terms are introduced in subtitles without definition before the concept is introduced in the text, such as in Fig. 39, page 90, where cirque and alluvial fan are introduced, with explanations on pages 112 and 340, respectively, top-set beds, Figs. 50 and 52, pages 109 and 111, and bottom-set beds, Fig. 51, page 110, defined on page 132. Some words new to text treatments, such as "glacierization," are introduced as though they were stock. Some new limitations on common concepts such as restricting magma to plutonic environments, and legalizing "molten lava" for surface magma, appear. This usage may be desirable in modern petrology, but it will probably have limited adoption. A noble effort is found in carefully explaining basic language roots for all technical terms. A few careless statements are evident, such

[1] One important implementation is the recent announcement that a systematic set of 290 colored slides keyed to this text is available from Ward's Natural Science Establishment, Rochester, N. Y.