mercial lecithin, painted thinly on the bottom of a planchette, is an admirable tissue adhesive. It has the advantages of (1) rapid arrival at a constant weight, (2) excellent adhesive properties, (3) resistance to heat treatment, (4) low surface tension, which promotes spreading of fluid samples into thin layers, and (5) permanence for storage.

The method we have used is to swab a thin layer on as many planchettes as are needed, allowing them to dry to equilibrium with room air. In our air-conditioned laboratory, it has been found that the moisture content is so stable that planchettes can be preweighed and stored, with errors of only a few tenths of a mg in subsequent use. We then weigh the wet tissue on the planchette and dry thoroughly on a slow hot plate. In this process, the tissue and lecithin form a tenacious bond that prevents the tissue from curling or flaking and keeps it so adherent to the metal that even accidental dropping to the floor seldom disrupts it. The lecithin film promotes the spreading of drops of blood or of standard solution, thus assuring better and more consistent geometry in the counting chamber. Lecithin remains plastic and sticky even after heating, and long half-life isotopes can be stored safely and counted several days later.

We have not made quantitative measurements of the effects of the lecithin film on back-scattered β-activity from the metal planchette, but it is assumed that, since the film is quite thin and its density low, this effect will not be important, especially if the standard isotope solutions and tissues are handled similarly. Furthermore, the more consistent geometry of tissues bonded to their planchette by lecithin should give a more uniform back-scattering from sample to sample, thus offsetting the slight losses.

Among the other adhesives, it was found that albumen promotes spreading but readily flakes on drying; acacia, although adhering well to tissue, forms a very poor bond to the metal; hydrophobic adhesives, on the other hand, such as Canada balsam, acetate cements, and fish glue, although bonding well to the metal, do not stick to tissue.

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Book Reviews

The Nature and Properties of Soils: A College Text of Edaphology (Lyon, Buckman, and Brady). 5th ed. revised by Harry O. Buckman and Nyle C. Brady. New York: Macmillan, 1952. 591 pp. $5.75.

This is an extensive revision of the earlier text of the same title. In the revision the authors have not only brought the material up to date to conform to the rapid progress made in the field of soil science in recent years, but they have also extensively revised and rewritten large sections of the book.

The text closely follows the excellent sequence found in previous editions. The initial chapters are devoted to a general discussion of soils, designed not only to provide the student with a degree of orientation in the field of soil science and an appreciation of the importance of soil, but also to acquaint him with some of the problems. The authors begin the detailed treatise with a discussion of the physical and chemical make-up of soils and soil materials. Succeeding sections of the book treat, respectively: soil life and its influence on soil properties, soil water and its control or management, soil air, the genesis of soils and the principles and schemes of soil classification, and organic soils. The concluding chapters cover plant nutrients and their availability in soil, the use of manure and green manure, and the principles of practical management of field soils. In general the book gives a good, balanced discussion of soils, their formation, and use.

The book is intended for beginning students in soil science, but the authors have presumed a general knowledge of elementary chemistry and physics on the part of the reader, courses commonly taken during the freshman year in college. The text, therefore, is best adapted for general courses in soil science taken during the sophomore or junior year.

Numerous subheads and a generous supply of figures make the text easy to follow and enhance the presentation of the technical material. The book is a good text for beginning students in soils, as well as a valuable source of general up-to-date information for all who are interested in soil science.

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Molybdenum Compounds: Their Chemistry and Technology. D. H. Killeffer and Arthur Linz; with a chapter on "The Structural Chemistry of Molybdenum" by Linus Pauling. New York–London: Interscience, 1952. 407 pp. $10.50.

Molybdenum has found its chief technical use in nonferrous alloys and more importantly in alloy steels. The current interest in the use of the unalloyed metal as a material of construction, when the problems of high temperature become critical, promises further metallurgical importance. However, the chemistry of molybdenum has received, by comparison, little attention either in inorganic texts or in the chemical literature. As the authors also say, the comprehensive trea-

tises of inorganic chemistry "report everything about the chemistry of the element—true and false, probable and fantastic."

These considerations have prompted the authors, who represent a company that is a leader in the technology of the element, and who, therefore, can write authoritatively, to prepare a text that can be of great value to those dealing with the metal or with the complexity of its reactions.

The properties of molybdenum are presented in a critical manner; the fundamental chemistry is discussed in chapters on the oxides, halides, sulfides, and in chapters on complex ions. Uses of compounds are described, as is the role of molybdenum in life processes. The chapter on "Analytical Procedure" includes those used by the Climax Molybendum Company; as such, they are to be considered as authoritative. The importance of molybdenum catalysts is emphasized by the listing and abstracting of 1755 patents and 535 journal references.

All the chapters are well documented with literature references, a valuable part of the book. The text is free from typographical errors, and the book is well bound and printed.

Molybdenum Compounds should be found in the library of all inorganic chemists and of others whose interests deal with this element in its many forms and uses.

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The Primeval Atom: An Essay on Cosmogony. Georges Lemaître; trans. by Betty H. and Serge A. Korff. New York: Van Nostrand, 1950. 186 pp. $3.00.

For some twenty years past Canon Lemaître has been working toward an extremely bold and most exciting theory of cosmogony. This theory has as its cornerstone the hypothesis that the present physical universe had its origin in a single massive superradioactive atom, whose decay products after many generations are to be identified with the material particles and radiation constituting the universe. The spatiotemporal structure of the universe is then the expression of the external relations of this horde of product particles, governed by the field equations of the general theory of relativity as developed in the theory of the expanding universe. At each stage in the evolution, the material particles are accordingly subject to an attractive force and to a repulsive force, the former (gravitation) more effective at shorter distances, and the latter (due to the "cosmological constant") more effective at greater distances. The interplay of these two forces brings about the aggregation of matter into stars, of stars into well-defined galaxies, and of galaxies into more loosely organized nebular clusters. Meanwhile, the more vagrant high energy particles and radiation resulting from the decay are coursing through the finite closed universe as ultrapenetrating cosmic rays.

Such is the grand scheme of Lemaître's cosmogony; rather than a finished theory, it is an outline of problems to be attacked, enlivened by most exciting suggestions as to how the answers may be expected to fall out. This is the fare which is offered the intellectually mature English reader in the present little volume of five of Lemaître's papers and addresses. These essays, tied together by an introduction written by the author, represent a spread in time from 1929 to 1945; although some repetition is thus inevitable, the spread enables the reader to partake vicariously in the evolution of the theory. The more technical aspects of the subject are for the most part only alluded to in passing, but the technical expert will find the mathematical backbone of the hypothesis, the theory of the expanding universe, most elegantly presented in an appendix. The more philosophical implications of the effort are touched upon in a preface by Ferdinand Gonseth, and its relation to astronomical fact in a brief foreword to the English edition by Henry Norris Russell. The translators, recognizing that "translation involves a compromise between transliteration of the author's words and conveyance of the author's meaning" have consciously leaned heavily toward the former, with the result that in some cases the author's meaning has been somewhat obscured by a too literal translation.

Let no one be misled by the author's distinguished position in the Church to expect to find therein the *raison d'être* for his cosmogony. Its formulation is a truly scientific venture, which is to stand or to fall on its ability to measure up to the facts in accordance with accepted scientific methodology. The general reader will find intellectual stimulation in this splendid account of the hypothesis of the primeval atom, and the technically expert among them may well be incited to accept the challenge to test the hypothesis where it impinges upon his own field.

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Scientific Book Register

The Prenatal Origin of Behavior. Porter Lectures, Series 18. Davenport Hooker. Lawrence: Univ. Kansas Press, 1952. 143 pp. Illus. $2.50.

Handbook of Aerial Mapping and Photogrammetry. Lyle G. Trorey. New York: Cambridge Univ. Press, 1952. 180 pp. Illus. $6.00.

Structural Aspects of Cell Physiology. Symposia of the Society for Experimental Biology, No. VI. New York: Academic Press, 1952. 357 pp. and plates. $7.50.

A Field Guide to Shells of the Pacific Coast and Hawaii. The Peterson Field Guide Series. Percy A. Morris. Boston: Houghton Mifflin, 1952. 220 pp. and plates. $3.75.

Storage Tubes and Their Basic Principles. M. Knoll and and B. Kazan. New York: Wiley; London: Chapman & Hall, 1952. 143 pp. Illus. $3.00.

An Introduction to Medical Science: An Elementary Text on Pathology. 4th ed. William Boyd. Philadelphia: Lea & Febiger, 1952. 304 pp. Illus. $4.50.