

are universally based on the assumption that the pollen grains are dispersed uniformly through vast volumes of air. This is the only assumption on which one can base the premise that the pollen counts taken at U. S. Weather Bureau city offices are meaningful to the residents of cities. It is, however, absolutely impossible to attain a state of uniform dispersion of particles the size of pollen grains in any appreciable volume of open air. Concentrations at any specified point depend primarily on the distance up-wind to the nearest pollen source and on the wind speed. Because of the slow rate of dispersion, the random nature of the location of sources, and the random occurrence of upward gusts, the pollen count may change quite drastically from one point to another only a short distance away and from one moment to another at a given point. It is undoubtedly this anisotropy that renders "official pollen counts" clinically useless, although this does not necessarily mean that pollen counts are useless. Counts made at any point in conjunction with pertinent meteorological observations (i.e., wind speed and direction) would give useful information on the relations of pollen counts to the weather. It is even conceivable that particularly offensive local pollen

sources could be located and eradicated by this method. In any case, the hay fever patient, whose allergy is reasonably specific, will derive greater benefits from the correlation of personal weather observations and symptoms, or pollen counts, for by this means he will be forewarned of unfavorable or favorable conditions to come.

Instead of reporting of "pollen counts," local weather bureau and news dispensers would be more helpful if they would forecast wind speeds and directions, and the general expected state of air pollution (*stability*, in meteorological parlance). These are elements of the weather and, contrary to an apparent popular impression, they are fully as important as the temperature and humidity in a given locality.

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References

1. SUTTON, O. G. *Quart. J. Roy. Meteorol. Soc.*, **73**, 257 (1947).
2. HEWSON, E. W., et al. *Research on Turbulence and Diffusion of Particulate Matter in the Lower Layers of the Atmosphere*. Final Rept. Round Hill Field Station, MIT (1951).

Book Reviews

Introduction to Geophysical Prospecting. Milton B. Dobrin. New York-London: McGraw-Hill, 1952. 435 pp. \$7.00.

The author has produced a much-needed textbook, intermediate in character between the exhaustive treatises by C. A. Heiland and J. J. Jakosky, and the more popular treatment by Eve and Keyes. The treatment is similar to L. L. Nettleton's in *Geophysical Prospecting for Oil*, but is more exhaustive and, furthermore, attempts to include a coverage of geophysics in mining exploration. Because of the author's association with a petroleum company, it is to be expected that the treatment of oil geophysics will be more accurate and more thorough than that of mining geophysics. By far the larger part of the book is devoted to the geophysical techniques that have contributed so greatly to the development of the oil industry—108 pages being devoted to seismic technique, 89 pages to gravitational techniques, and 73 pages to magnetic prospecting, whereas electrical methods (exclusive of well-logging) are covered in 28 pages, and radioactive methods in 19 pages. The remaining 100-odd pages are devoted to the integration of geophysical methods, well-logging methods, radio position locations, and current research in geophysical exploration. The allocation of space reflects the current relative importance and extent of application of geophysical methods in the oil industry in contrast with the mining industry.

The treatment of the various subjects is mathematical in approach, but does not require knowledge of mathematics beyond trigonometry. It is not an elementary text suitable to a survey course for geologists or engineers, but it should be valuable as an introductory text for those who expect to be, or to work closely with, geophysicists. Each branch of geophysics is dealt with systematically, and the fundamentals of that geophysical science to which each exploration technique is related is considered. Thus, the subject of gravitational prospecting is related to the broader field of the earth's gravitational force; magnetic prospecting is set against the background of the earth's magnetic field; and earthquakes and the information they yield about the internal constitution of the earth form the background for the discussion of reflection and refraction prospecting. Considerable attention is devoted to the instruments used in the various methods, the treatment of the data obtained, and the interpretation of the results.

The few paragraphs devoted to the history of geophysical prospecting give the erroneous impression that the electrical and magnetic techniques are recent developments. No acknowledgment appears of the early work of Robert Fox, of Cornwall, in 1830, and of Carl Barus in Nevada in 1880, on the spontaneous polarization or self-potential method, nor of the fact that Robert Fox was the first to suggest that resistivity measurements of the earth could yield geological

information. The work by C. and M. Schlumberger is mentioned, but no credit is given to Hans Lundberg for his pioneering developments in the field of alternating current prospecting. The history of magnetic prospecting also suffers from overcondensation; magnetized bars were used in prospecting for iron ore in Sweden as early as 1640, and a dip needle survey was made of New Jersey about 1760.

Some criticism must be leveled against carelessness in editing and proofreading. Some of the bibliographic references are incorrectly cited, and there are also omissions and errors in the text, affecting particularly the field of mining geophysics. The spontaneous polarization method is omitted from the tabulation on page 5, and the electrical resistivity technique is included therein as though its only function were to determine the depth to interfaces, such as water tables and bedrock. Mention of its application in the search for quartz veins, for shear zones, and in mapping geological structures is omitted. The author states (p. 286) that the spontaneous polarization method is "... valid only for locating ores within 100 feet of the surface." The depth limitation placed upon the method by those cognizant with the procedure is usually 300 feet. On page 290 he states that, although the strongest spontaneous polarization potentials "... are excited in sulphide ores such as pyrites, a number of other minerals such as pyrrhotite and magnetite, give rise to spontaneous polarization patterns. . . ." Magnetite does not ordinarily give rise to spontaneous polarization currents, and pyrrhotite is just as much a sulfide as pyrite. The author tends to use the terms "ore" and "sulphides" as though the two were synonymous, to which any mining engineer or geologist would take violent exception. A line or so further down from

the above quotation, the author refers to a 1700 mv potential anomaly in Peru. This is an impossible potential, and the value reported was actually 700 mv.

It is to be hoped that in future editions of this book the subject of mining geophysics will be more adequately treated, and that errors and omissions such as those cited above will be remedied. The present edition suffers from the fact that the author, himself an oil geophysicist, has submitted his manuscript for review only to other oil geophysicists, who have given a cavalier treatment to the geophysical techniques used in mining exploration. Aside from this criticism, the author is to be congratulated on having produced a book that fills a serious gap in geophysical literature.

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Proceedings of the London Conference on Optical Instruments 1950. New York: Wiley, 1952. 264 pp. \$7.00.

The London Conference on Optical Instruments, sponsored by the Royal Society through its Subcommittee for Optics, was held in July 1950 at the Imperial College. The present volume represents a collection of the papers given, including the introductory address by Sir Thomas R. Merton. Altogether, 21 papers are included, most of them followed by summaries in English and French. The different topics discussed concerned photographic and projection lenses, reflection microscopy, gratings and grating instruments, phase-contrast microscopy, spectrophotometers, reflecting telescopes, and new optical materials.

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Scientific Book Register

The Nile. A general account of the river and the utilization of its waters. H. E. Hurst. London: Constable; New York: Macmillan, 1952. 326 pp. Illus. \$6.00.

The Permeability of Natural Membranes. Reissue. Hugh Davson and J. F. Danielli. New York: Cambridge Univ. Press, 1952. 365 pp. Illus. \$6.00.

Postural Development of Infant Chimpanzees. A comparative and normative study based on the Gesell behavior examination. Austin H. Riesen and Elaine F. Kinder. New Haven, Conn.: Yale Univ. Press; London: Geoffrey Cumberlege, Oxford Univ. Press, 1952. (For the Yerkes Laboratories of Primate Biology.) 204 pp. Illus. \$5.00.

The Oxidation States of the Elements and Their Potentials in Aqueous Solutions. 2nd ed. Wendell M. Latimer. New York: Prentice-Hall, 1952. 392 pp. Illus. \$7.50.

Problems of Consciousness. Transactions of the Third Conference, March 10-11, 1952, New York. Harold A. Abramson, Ed. New York: Josiah Macy, Jr. Fdn., 1952. 156 pp. Illus. \$3.25.

Computing Methods and the Phase Problem in X-Ray Crystal Analysis. Report of a conference held at The Pennsylvania State College, April 6-8, 1950. Ray Pepinsky, Ed. State College: X-Ray Crystal Analysis Laboratory, Pennsylvania State College, 1952. 390 pp. Illus. \$7.50.

Elements of Food Engineering, Vol. I. Milton E. Parker, with collab. of Ellery H. Harvey and E. S. Stateler. New York: Reinhold, 1952. 386 pp. Illus. \$8.75.

Photoconductivity in the Elements. Trevor Simpson Moss. New York: Academic Press; London: Butterworths, 1952. 263 pp. Illus. \$7.00.

Essentials of Fluid Dynamics: With Applications to Hydraulics, Aeronautics, Meteorology and other Subjects. Trans. of 3rd ed. of *Führer durch die Strömungslehre.* Ludwig Prandtl. New York: Hafner, 1952. 452 pp. Illus. \$6.00.

The Molecular Theory of Fluids. Monographs on the Rheology of Natural and Synthetic Products. Herbert S. Green. Amsterdam: North Holland Pub.; New York: Interscience, 1952. 264 pp. Illus. \$5.75.