SCIENCE

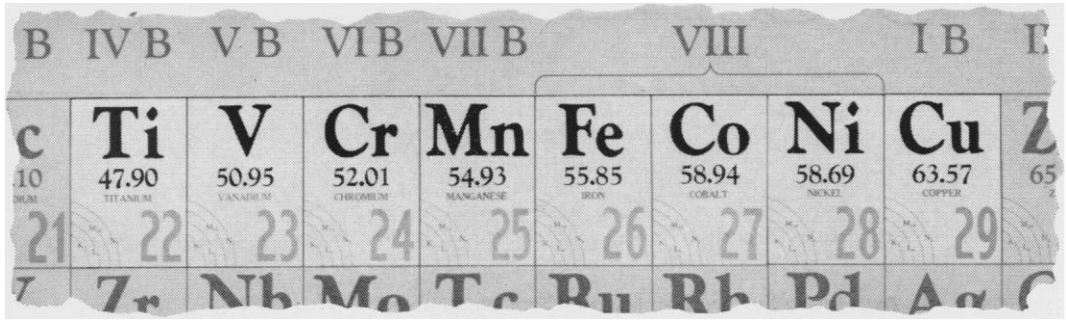
26 July 1957

Volume 126, Number 3265

QUICK DETECTION OF PARAMAGNETIC IONS

E-P-R AT WORK **6**

(Electron Paramagnetic Resonance)



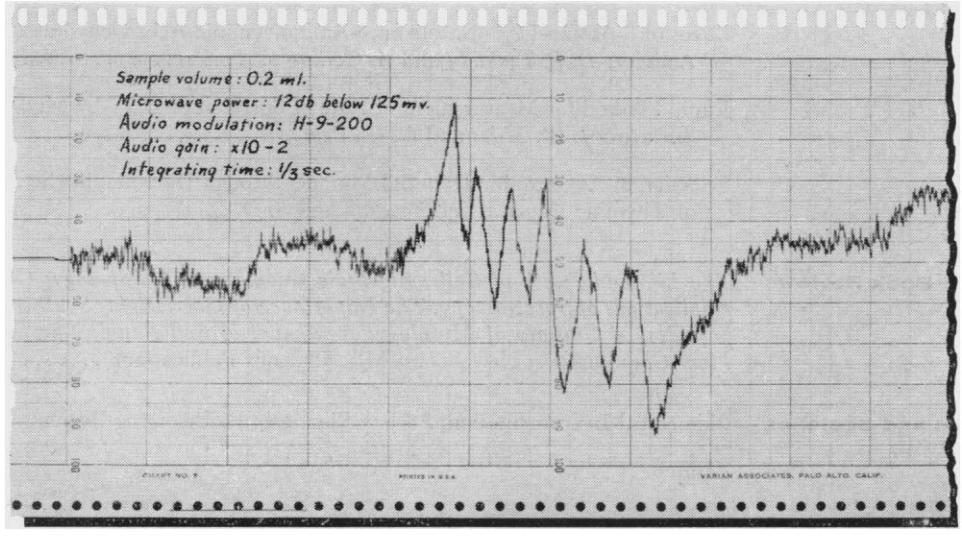
Where a trace of a transition element ion constitutes either a harmful impurity or a key to a chemical, physical or biological phenomenon, quantitative determination by E-P-R spectroscopy has a number of advantages. The test is fast and non-destructive. A typical sample size is 0.1 cc and the method is effective on concentrations as low as 10^{-6} molar. On a routine basis a quantitative E-P-R test can be made in a few minutes. The same results by chemical analysis might require hours or days of painstaking effort.

E-P-R Spectroscopy is effective on most transition element ions because the unfilled electronic shell causes the ion to be paramagnetic. Each ion yields a characteristic E-P-R spectrum which identifies its presence and concentration. By further interpreting this spectrum, the scientist can also determine configuration mixing and magnitudes and symmetries of microscopic electrostatic fields at the paramagnetic ion site. An example is shown below.

Number 6 of a series **PARAMAGNETIC IONS IN MICRORGANISMS**

INTERPRETATION: Transition elements form a critical part of the diet for most microrganisms. The ability of many of these organisms preferentially to concentrate certain of these elements is well known; however, the monitoring techniques have been the standard time-consuming chemical processes.

E-P-R provides rapid analyses for many of the ions of these elements as evidenced by the spectrum below.
The spectrum is that from a young culture of Ustilago grown on a medium containing Manganese. The six lines are those from Mn^{2+} resulting from isotropic hyperfine coupling of the electrons to the Mn^{55} ($I = 5/2$) nucleus.



For full technical details on E-P-R and N-M-R Spectroscopy and Spectrometers, write to the Varian Associates Instrument Division

VARIAN associates
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that are the most difficult to find in the literature. One hundred and fifty pages are given to the Phycomycetes; a large number of these are devoted to the Mucorales and based on Zycha's monograph, which is in German and is not available to many workers. The Ascomycetes are covered in 36 pages, and the Basidiomycetes in one. Many of the species that are described here are important in medicine and industry and as the agents of food spoilage. Some cause the deterioration of cellulose, leather, and other important products.

Following the descriptive text is a list of pertinent literature, with 245 titles and a glossary of several hundred terms. The book is well furnished with usable keys for identification, down to the species. The descriptions are well written, and line drawings illustrating the genera, and 13 plates of photomicrographs, add greatly to the book's usefulness.

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The Study of Plant Communities. An introduction to plant ecology. Henry J. Oosting. Freeman, San Francisco, Calif., rev. ed. 2, 1956. 440 pp. Illus. $6.

The appearance of a second edition of *The Study of Plant Communities* is a matter of great interest to students of vegetation and to other ecologists. An eminently readable book, suitable for an introductory course in synecology (of plants), it seems also to be the most satisfactory presentation available of much of the current thinking of the American school of plant ecology. This is one second edition that is definitely not a mere reprinting of the earlier edition. It has been critically rewritten; the author has profited from criticisms of the first edition and incorporates freely from the results of the present active period of thinking and publishing in the field.

Especially welcome are the full discussion and comparison of the monoclimax and polyclimax ideas, although one could have wished that the treatment of polyclimax had been as well integrated and sympathetic as that of monoclimax. The introduction of the ecosystem concept is an important innovation, although it is touched on much more lightly than the publisher's advertising leads one to expect. Also very valuable is the greatly expanded bibliography, abundantly referred to throughout the text. This suffers seriously, however, from the usual American weakness of completely inadequate inclusion of foreign literature. Only seven items in languages other than English are included, and five of these are classics. It is doubtful that the provincialism of American natural science and the ineptitude with languages of American scientists will ever be significantly lessened as long as authors of the most important textbooks continue to convey the impression that a student can get along perfectly well with only a knowledge of English.

Little attention is paid in this book to the several European schools of phytosociology. True, the Braun-Blanquet school is mentioned, and certain of its concepts and methods of collecting data are described. However, its basic philosophy, its recent development, and its important contribution to the plant indicator concept are not touched on. And, in the current passion for objectivity, the greatest contribution of Braun-Blanquet —the subjective selection of plots—is not even mentioned. This amounts to a recommendation that the best tool available to the phytosociologist, the trained human mind, be neglected. However, the repeated emphasis elsewhere in the book on the importance of good judgment suggests that such is not really the intention of the author. The fine chapter on applied ecology also suggests that the author himself has brought to his work a first-class intellect and has made exceptionally good use of it.

In general, this volume can be highly recommended, both as a textbook for students and as an exposition of the views of the American school for other scientists and foreign professionals. It will not meet the philosophic objections of some of the critics of the earlier edition, since the author's own philosophy has not changed. But the material that is presented may actually be more within the grasp of the audience for whom it was intended in its present form than if the approach had been strictly from a holistic viewpoint.

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New Books

Recent Advances in Anaesthesia and Analgesia (including oxygen therapy). C. Langton Hewer and J. Alfred Lee. Little, Brown, Boston, Mass., ed. 8, 1957. 303 pp. $8.50.

One Man's Life with Barley. The memories and observations of Harry V. Harlan. Exposition Press, New York, 1957. 223 pp. $6.

Theories of Nuclear Moments. R. J. Blin-Stoyle. Oxford University Press, London, 1957. 89 pp. $1.40.

Principles of Immunology. John E. Cushing and Dan H. Campbell. McGraw-Hill, New York, 1957. 343 pp. $6.50.

Geologic Field Methods. Julian W. Low. Harper, New York, 1957. 504 pp. Professional edition, $6; text edition, $4.50.

Hospital Treatment of Alcoholism. A comparative, experimental study. Menninger Clinic monograph ser. No. 11. Robert S. Wallerstein and others. Basic Books, New York, 1957. 223 pp. $5.

Visual Methods in Education. W. L. Sumner. Philosophical Library, New York, ed. 2, 1957. 231 pp. $6.

The Demand and Supply of Scientific Personnel. David M. Bland and George J. Stigler. National Bureau of Economic Research, New York, 1957. 219 pp. $4.

The Principles of Heredity. Laurence H. Snyder and Paul R. David. Heath, Boston, Mass., ed. 5, 1957. 518 pp. $6.25.

The American Teenager. H. H. Remmers and D. H. Radler. Bobbs-Merrill, Indianapolis, Ind., 1957. 267 pp. $3.75.

Introduction to Electrical Applied Physics. N. F. Astbury. Philosophical Library, New York, 1957. 252 pp. $10.

Analytical Microscopy. Its aims and methods in relation to foods, water, spices, and drugs. T. E. Wallis. Little, Brown, Boston, Mass., ed. 2, 1957. 215 pp. $5.50.

The Biological Action of Growth Substances. Symposia of the Society for Experimental Biology, No. XI. Academic Press, New York, 1957. 351 pp. $9.50.

The Early Diagnosis and Treatment of Acoustic Nerve Tumors. J. Lawrence Pool and Arthur A. Pava. Thomas, Springfield, Ill., 1957. 169 pp. $5.50.

Miscellaneous Publications

(Inquiries concerning these publications should be addressed, not to Science, *but to the publisher or agency sponsoring the publication.)*

Conference on the Role of Gravitation in Physics. At the University of North Carolina, Chapel Hill, 18–23 January 1957. WADC Tech. Rept. 57–216. ASTIA Document No. AD 118180. Wright Air Development Center, Wright-Patterson Air Force Base, Ohio, 1957 (order from ASTIA Document Service Center, Knott Building, Dayton 2, Ohio). 155 pp.

Papers on Reduction Methods for Photographic Meteors. Smithsonian Contributions to Astrophysics, vol. 1, No. 2. 61 pp. *Chromospheric Spicules.* Sarah L. Lippincott. *Studies of Solar Granulation.* Gerard Wlérick. *Variations in the Thermodynamic State of the Chromosphere over the Sunspot Cycle.* R. G. Athay, D. H. Menzel, F. Q. Orrall. Smithsonian Contributions to Astrophysics, vol. 2, Nos. 2–4. 36 pp. Smithsonian Institution, Washington, 1957.

Blueprints in 3-D and Drawing in Motion. David Gordon. The Author, 771 Lindley St., Bridgeport, Conn. 2 pp.

The Culicine Mosquitoes of the Indomalayan Area. pt. 1, *Genus Ficalbia Theobald.* P. F. Mattingly. 61 pp. 15s. *New Genera and Species of Ethiopian, Mascarene and Australian Reduviidae (Hemiptera-Heteroptera) in the British Museum (N.H.), London.* Bulletin, Entomology, vol. 5, No. 2. 53 pp. 5s. *The Sessile Tunicata.* John Murray Expedition 1933–34, Scientific Repts., vol. X, No. 4. Patricia Kott. 21 pp. 8s. British Museum (Natural History), London, 1957.