gation of electron paramagnetism in metals is ably presented by Knight, who has contributed so much to these developments. Pake's article is a lucid introduction to nuclear magnetic resonance and is long on discussions of relaxation times but short on other types of applications to solid-state problems (for example, one looks in vain for mention of the interesting results on the sublattice magnetization obtained by Poulis in his work on the proton resonance in an antiferromagnetic crystal).

A book like this, however, can be all things to all men. If, by chance, the particular volume contains a good article of special interest to the reader, he will be very pleased; otherwise, the tendency is to ignore entirely a given volume with its heterogeneous collection of articles and return to the less exhaustive but more coherent discussion to be found in a single-volume presentation. One can hope, though, that coherence will appear when the series as a whole is available, although the student will still require a good guide through the maze.

The book appears to have an adequate name and subject index; it is nicely composed and printed, but it has an unimaginative binding which, in my copy, quickly tore loose from the main bulk of the pages.

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Chemistry and Uses of Pesticides. E. R. de Ong. Reinhold, New York; Chapman and Hall, London, ed. 2, 1956. 334 pp. Illus. $8.75.

As stated in the preface, this book has been rewritten and brought up to date. Numerous references to the literature of 1955 are included. Citations to the literature, rather than the author's knowledge and experience, are the source of authority. The book is a compendium rather than a textbook or treatise, for it considers individual pesticidal active principles as single or pure substances, giving for each something of the chemical and physical properties, the uses for which it has been recommended, and its toxicology and pharmacology.

No important omissions have been noted, and a number of substances that are still considered experimental are mentioned. References to crops and pests are therefore incidental but can be traced through the index. Inorganic compounds are treated in 81 pages; petroleum products in 26; fumigants in 38; derivatives of plants in 30; synthetics in 96; heat, cold, dehydration and radiation in 15; and tolerances and exemptions from the requirements of tolerances of residues in two. Citations grouped at the end of each section are relied on for details of directions not to be expected in a book of this size.

There is no section on the pesticide laws and the requirements of lawful labeling, nor is there one on fertilizer-pesticide mixtures. Since the book relies so much on publications, its reliability can hardly be questioned. It should be more valuable to workers and students with a chemical background than to growers and farmers.

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Handbuch der Physik. Band XXXVI. Atome II. S. Flügge, Ed. Springer-Verlag, Berlin, 1956. 424 pp. Illus. DM. 88.

This volume of the famed *Handbuch*'s new edition contains four articles: "Quantum mechanics of the atom" by Friedrich Hund and "Statistical treatment of the atom" by Paul Gombas, both in German, and "Theory of atomic collisions," and "Excitation and ionization of atoms," both in English, by Harrie Stewart Wilson Massey. The authors write from great authority and with careful attention to the latest advances in their fields, but the vast amount of material covered in such review articles makes for a condensed style that demands much study as a prelude to understanding.

In Massey's beautiful article on atomic collisions, enough illustrative detail is provided for the simpler cases of *s*-wave scattering to make clear the essential ideas. It might nevertheless have been more helpful to the student if a few more steps had been provided at the risk of boring the experts. The article is much more general than the title indicates, and the enrichment of the calculational techniques by contributions from workers in nuclear scattering problems is evident throughout.

Massey's second article interweaves in a skillful manner a historical discussion of experimental techniques and results and a comparison with theoretical predictions. The article concludes with a description of applications of excitation and ionization to electric discharges in gases, the aurora, and so forth, thus relating the discussion to other fields.

Hund's article proceeds through a brief historical introduction, leaning heavily on the correspondence principle, to a treatment of the one-dimensional model and the approximations of perturbation theory and the method of Jeffreys (WBK). It is my impression that the emphasis on the correspondence principle is rather heavy despite its historical importance. A description of the periodic system is given; it lists the various quantum state specifications in spectroscopic notation without much discussion of how these things came to be known. However, these criticisms are of minor importance when the article is viewed as a whole, for the article provides a comprehensive summary of the symmetry characteristics of atomic systems from the point of view of group theory, the effect of electron spin, the basis for the vector model, and a discussion of approximation methods, stressing the self-consistent treatment due to Hartree.

The article by Gombas introduces the necessity for a statistical point of view which results from the complexity of the many-body problem. The basis for the treatment of atomic problems in the Fermi-Dirac statistics is noted as applying to electrons, and the simple Thomas-Fermi model is treated. Various corrections to the model such as exchange and relativistic effects are described, as well as the application of the model to the equations of state for extreme pressures and temperatures. Comparisons are made between the results given by the Hartree-Fock method and those of Fermi-Thomas statistical theory, and it is made clear that remarkable agreement between the two points of view is often possible. The general usefulness of the statistical method to questions of molecular structure and of the interaction of gamma radiation with atoms is also indicated. In addition to copious references throughout the Gombas article, an extensive bibliography with references through 1955 is given at the end.

Infrequent typographical errors and failures of the printing to register made for a small amount of confusion.

FREDERICK REINES
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Ninth Annual Report of the Advisory Council on Scientific Policy 1955–1956. Her Majesty's Stationery Office, London, 1956 (order from British Information Services, 30 Rockefeller Plaza, New York 20). 12 pp. $0.14.

In the United Kingdom, the member of the cabinet who is responsible for the formulation and execution of government scientific policy is the Lord President of the Council. On general questions relating to the whole field of civilian science, the Lord President is advised by an Advisory Council on Scientific Policy, which was established in 1947 and is composed of eminent men from the universities, industry, and government. The type of information contained in the annual reports of the council parallels in many instances that to be found in the reports of the U.S. National Science

Foundation—for example, expenditure on research, manpower, and education in the field of science.

During the year under review, the council sponsored two inquiries into scientific manpower. The results of the first inquiry were published in November 1955 under the title *Recruitment of Scientists and Engineers by the Engineering Industry*. This inquiry, carried out by the council's Committee on Scientific Manpower, dealt with the value which firms in the engineering industry attach to different methods of training professional engineers.

The Committee on Scientific Manpower followed up this inquiry with two further studies, the first on the present distribution of scientists and engineers and the second on the likely demands for such persons during the next 10 to 15 years. The first study was a comprehensive statistical survey, carried out by the Ministry of Labour, of the number of scientists and engineers now in industry and of industry's estimate of its expected demands in the coming three years. The committee itself undertook to estimate long-term demands. The results of both these investigations have recently been published jointly by the council and the Ministry of Labour under the title *Scientific and Engineering Manpower in Great Britain*.

Other topics discussed by the council in its current report are availability of Soviet scientific and technical literature, population problems of tropical countries, and the need for an institute of tropical agriculture.

Inhaltsstoffe und Prüfungsmethoden Homöopathisch Verwendeter Heilpflanzen. Herbert Schindler. Editio Cantor, Aulendorf, West Germany, 1955. 231 pp. Illus.

This volume hides a wealth of information behind an unpretentious title. The author has selected 115 plants and described and discussed their medicinal properties. He brings up to date material that has not been compiled since Wehmer's *Die Pflanzenstoffe* was revised during the period from 1929 to 1935.

The comparison with Wehmer's classical work is, of course, qualitative, not quantitative. The plants which Schindler includes in this volume are the ones he considers important in homeopathy. However, he goes far beyond the narrow confines of homeopathic application. His book represents much more than a discussion of drug plants used for this particular purpose. He deals with each plant in such an exhaustive manner that many of the individual chapters could quite well have been published independently. A considerable amount of literature that, to my knowledge, has not been gathered together elsewhere is cited.

Analytic methods are discussed in a concise manner. One is tempted to make a comparison with some of the chapters of another German classic, Klein's *Handbuch der Pflanzenanalyse*. I consider this part of Schindler's contribution of unique value from which the recent publication of Paech's and Tracey's monumental *Modern Methods of Plant Analysis* does not detract. By focusing distinct constituents of pharmacological and pharmacognostical interest and often by discussing them in greater detail, Schindler furnishes a valuable extension of the information given in the handbooks mentioned.

The student of drug plants and plant drugs can hardly afford to overlook Schindler's book. Reading it will prompt him to express the hope that the author may deal with other plant species in a similar manner.

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New Books

Ageing in Industry. An inquiry, based on figures derived from census reports, into the problem of ageing under the conditions of modern industry. F. Le Gros Clark and Agnes C. Dunne. Philosophical Library, New York, 1956. 150 pp. $7.50.

Perspectives in Personality Theory. Henry P. David and Helmut von Bracken. Basic Books, New York, 1957. 435 pp. $6.50.

Franklin and Newton. An inquiry into speculative Newtonian experimental science and Franklin's work in electricity as an example thereof. I. Bernard Cohen. American Philosophical Society, Philadelphia, 1956. 657 pp. $6.

Principles and Problems of Modern Economics. William A. Koivisto. Wiley, New York; Chapman & Hall, London, 1956. 834 pp. $6.

The Structure of a Moral Code. A philosophical analysis of ethical discourse applied to the ethics of the Navaho Indians. John Ladd. Harvard University Press, Cambridge, 1957. 474 pp. $8.

Structure of Rings. American Mathematical Society Colloquium Publ., vol. XXXVII. Nathan Jacobson. American Mathematical Society, Providence, R.I., 1956. 263 pp. $7.70.

Breads, White and Brown. Their place in thought and social history. R. A. McCance and E. M. Widdowson. Lippincott, Philadelphia, 1956. 174 pp. $5.

Fatigue in Aircraft Structures. Proceedings of the International Conference held at Columbia University, 30 Jan.–1 Feb. 1956. Alfred M. Freudenthal, Ed. Academic Press, New York, 1956. 456 pp. $12.

Lymphatics, Lymph and Lymphoid Tissue. Joseph M. Yoffey and Frederick C. Courtice. Harvard University Press, Cambridge, 1956. 510 pp. $10.

Miscellaneous Publications

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

Geologic Atlas of Utah, Emery County. Bull. 52. William L. Stokes and Robert E. Cohenour. Utah Geological and Mineralogical Survey, University of Utah, Salt Lake City, 1956. 92 pp. $5.

Studies of the Mississippian Algae. Quarterly of the Colorado School of Mines, vol. 51, No. 4. J. Harlan Johnson and Kenji Konishi. Colorado School of Mines, Golden, 1956. 131 pp. $1.50.

The Manner of Demonstrating in Natural Philosophy. A dissertation. Melvin A. Gultz. Pontifical Faculty of Philosophy, River Forest, Ill., 1956. 184 pp.

Services for Exceptional Children. Proc. of the 1956 Spring Conference, Woods School. Indiana University Medical Center, Indianapolis, 1956. 133 pp.

Franz Joseph Gall, Inventor of Phrenology and His Collection. Wisconsin Studies in Medical History, No. 1. Erwin H. Ackerknecht and Henri V. Vallois. Translated from the French by Claire St. Leon. Dept. of History of Medicine, University of Wisconsin Medical School, Madison, 1956. 86 pp. $1.50.

School Property Insurance. Experiences at state level. Bull. 1956, No. 7. N. E. Viles. 61 pp. $0.25. *Teachers of Children Who Are Blind*. Bull. 1955, No. 10. Romaine P. Mackie and Lloyd M. Dunn. 109 pp. $0.40. U.S. Office of Education, Washington 25, 1956 (order from Supt. of Documents, GPO, Washington 25).

Health and Demography. Halbert L. Dunn. U.S. Public Health Service, Washington 25, 1956. 94 pp.

General Systems, Yearbook of the Society for the Advancement of General Systems Theory. vol. 1. Ludwig Von Bertalanffy and Anatol Rapoport, Eds. Society for the Advancement of General Systems Theory (Mental Health Research Institute, University of Michigan, Ann Arbor).

The Development of Polish Science, 1945–1955. Bogdan Suchodolski and Eugeniusz Olszewski. Polonia Publishing House, Warsaw, 1956. 91 pp.

Some Protozoan Diseases of Man and Animals: Anaplasmosis, Babesiosis, and Toxoplasmosis. Annals of the New York Academy of Sciences, vol. 64, No. 2. 253 pp. *Calcium and Phosphorus Metabolism in Man and Animals with Special Reference to Pregnancy and Lactation*. vol. 64, No. 3. 184 pp. *Effects of Natural Selection on Human Genotypes*. vol. 65, No. 1. 32 pp. *Epidemic and Endemic Diarrheal Diseases of Infants*. Annals of the New York Academy of Sciences, vol. 66, No. 1. 228 pp. Kenneth T. Morse, Ed. New York Academy of Sciences, New York, 1956.

On the Cell Model for Solutions. Annals of the New York Academy of Sciences, vol. 65, No. 2. 22 pp. Stuart A. Rice. New York Academy of Sciences, New York, 1956.

Studies on Seed-Setting and Seed Yield in Oil Flax. Meddelande Fran Gullakers Vaxtforadlingsanstalt, Hammenhog, Nr. 12. Rolf Manner. Meddelande Fran Gullakers Vaxtforadlingsanstalt, Hammenhog, 1956. 139 pp.