

2) The disease is associated more with a specific body build (the fat, muscular type) than with an increase of body weight.

3) The coronary patients are physically more masculine than the controls but are psychologically more feminine, possibly because of their cultural background.

4) The coronary patients are slightly hypothyroid.

5) Coronary heart disease can exist without hypercholesterolemia, even though this is often present; the predisposition is more important than any other factor.

The book is well arranged and its reading is easy and pleasant. The only criticism that can be made is the limitation to a small number of patients (100 cases) and the scarcity of patients of certain racial groups. This decreases the statistical value of the study. In spite of this, the monograph represents an important step in the slowly growing mass of knowledge about coronary heart disease.

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Vegetable Tanning Materials. F. N. Howes. *Chronica Botanica*, Waltham, Mass.; Butterworths, London, 1953. xi + 325 pp. Illus. \$5.50.

A cheerful soul may find the world a good place to live in and may find that trees have wholesome personalities. The vegetable tanning materials are characters that have been important for thousands of years in converting raw hides, which are almost as unstable as meat, into durable leather.

Native plants found in different parts of the world contain enough tannic acid, or similar compounds, to be useful in local tanning, and during the last 100 years tanning materials have become an important part of world trade.

Commercial extracts have been developed from barks, fruits, leaves, roots, plant galls, and even woods. They may be liquid, solid, or spray-dried powder. Evaporation is done under a vacuum or as a spray, because the less heating required, the greater the preservation of useful organic compounds.

Vegetable Tanning Materials authoritatively covers the 39 commercial vegetable tanning materials of the world, together with outlines of the processes for the manufacture of extracts and for vegetable tanning. Also discussed are the sizable world trade in these materials and the biology of the tannins. Other tanning materials than vegetable are indicated. The 16 illustrations and the 10 figures add to the reading interest. There are references to other works and a list of the botanical names.

The three materials (extracts) used throughout the world in largest tonnages are mimosa or wattle bark, which is cultivated on plantations in South Africa and Australia; quebracho wood, a slow-growing tree scattered through forests in the Argentina-Paraguay area; and chestnut wood from the mountain regions of the southern United States, France, and Italy. Hemlock and oak barks have been replaced by these three items.

Chestnut trees in the United States seem to be doomed by a blight, but the dead trees can be used along with the remaining live ones.

Of increasing importance is the bark of the mangrove tree, which grows in tropical swamps where rivers mix with salt water. Among other tanning materials covered and in general use are myrabolans, a dried fruit from India; sumac leaves from Sicily; acorn cups from Turkey, and divi-divi pods from tropical America.

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Crystal Data. Classification of substances by space groups and their identification from cell dimensions. J. D. H. Donnay and Werner Nowacki. *Memoir 60. Geological Society of America*, New York, 1954. ix + 719 pp. \$5.

This important and stimulating volume consists of two independently prepared and essentially unrelated tabulations of crystal data.

Part I, by Nowacki, consists of a listing by space group and general chemical nature of 3782 structures reported in the literature prior to July 1948. The purpose of this listing is to provide statistical data on the distribution of crystal structures among the 219 possible symmetrical packing arrangements that are permitted by our geometry. Nowacki refers in his preface to some preliminary use that he has made of this material in trying to understand one of the great unsolved problems of crystallography: Why does a particular chemical entity in a particular thermodynamic state pick one type of crystal packing rather than any other? Very little progress has been made in the understanding of this problem, but the present tabulation takes an important preliminary step.

Tables 1-6 represent numerical analyses of the data of the main table of part I. From these tables it is clear that nature concentrates on only a few of the many space patterns available to it. For 41 space groups no structures have been reported, while in 32 groups only one appears. Only 10 space groups have individually more than 3 percent of all structures, and together these 10 groups contain about 46 percent of all structures.

When one narrows the chemical classification, the figures become even more striking. In the inorganic structures, again 10 space groups contain more than 3 percent of the structures reported, and together these groups contain about 50 percent of the structures of this type. In the organic structures, only eight space groups have more than 3 percent and together these eight groups account for 60 percent of the structures. The three most popular space groups account for 43 percent of all organic structures. A final example concerns the aromatic and heterocyclic molecules which are often flat and are, therefore, particularly attractive to crystallographers. In this category, eight space groups contain more than 3 percent of all

structures, and together they contain 72 percent of all structures; one space group alone contains 42 percent of all structures. In the heterocyclic compounds taken alone, this same space group accounts for 54 percent of all structures, and only three other groups contain more than 3 percent.

The discussion of part I is best closed by a misquotation of parts of the preface:

Let us hope . . . that . . . the present statistical survey . . . will incite theoreticians to search for an explanation of the facts which it has brought to light.

Part II of *Crystal Data*, prepared by Donnay with the collaboration of many others, represents a major improvement on an already standard and essential tool of analytic chemistry. The powder method of identification of pure substances is used in thousands of scientific and industrial control laboratories throughout the world. With this very powerful method, one can very often achieve an identification of an unknown material, but in doing so one uses only a few of the facts that can be gleaned from a study of a single crystal. With modern single-crystal methods, it is very easy to determine the cell dimensions and the space group for an unknown material. If these data for the material have been previously recorded in a file, the unknown can be identified with much greater certainty than is possible with the powder method.

The present work is an attempt to provide such a file. Single-crystal data from an unknown material can be reduced by a standard procedure to a form that can be used to determine whether or not the substance in question has been listed. If it has been listed, the identification can be complete; if it has not been listed, the unknown is an interesting subject for an x-ray analyst.

The joint preface and the introductions to the sections disarm a reviewer who wants to be too critical. Both authors acknowledge with admirable candor their fallibility and indicate to the reader by their indexing technique the way in which this can be detected. From the point of view of accurate coverage of the published material, the two parts, separately and combined, leave much to be desired. In the future, no literature search should start without reference to this book, but unfortunately such a search cannot end here.

The authors and their collaborators are to be congratulated and commended for their contribution to the literature of crystallography despite the shortcomings of their work. Unfortunately, they cannot be expected to continue indefinitely in this tedious operation, and it is hoped that the International Union of Crystallography will be able to arrange for a collaborative effort to maintain these two important classifications.

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Books Reviewed in THE SCIENTIFIC MONTHLY

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The Psychology of the Criminal Act and Punishment, Gregory Zilboorg (Harcourt, Brace). Reviewed by D. W. Louisell.

Causality in Natural Science, Victor F. Lenzen, (Thomas). Reviewed by A. Rapoport.

Nobel Prize Winners in Chemistry: 1901-1950, Eduard Farber (Schuman). Reviewed by R. Adams.

Know Your Reader, George R. Klare and Byron Buck (Hermitage House). Reviewed by J. W. Hedgpeth.

A Field Guide to the Birds of Britain and Europe, Roger Tory Peterson, Guy Mountfort, and P. A. D. Hollom (Houghton Mifflin). Reviewed by C. H. Rogers.

The Climates of the Continents, W. G. Kendrew (Oxford Univ. Press, ed. 4). Reviewed by H. P. Bailey.

Personality through Perception, H. A. Witkin, H. B. Lewis, M. Hertzman, K. Machover, P. Brethall Meissner, and S. Wapner; Gardner Murphy, Ed. (Harper). Reviewed by S. C. Erickson.

The Natural History of Mammals, François Bourlière (Knopf). Reviewed by F. A. Pitelka.

Proceedings of a Conference on the Utilization of Scientific and Professional Manpower and Policy for Scientific and Professional Manpower, National Manpower Council (Columbia Univ. Press). Reviewed by H. A. Armsby.

Insecticides and Colonial Agricultural Development, T. Wallace and J. T. Martin, Eds. (Butterworths). Reviewed by B. B. Pepper.

Number: The Language of Science, Tobias Dantzig (Macmillan, ed. 4). Reviewed by E. T. Bell.

Basic Bacteriology, Carl Lamanna and M. Frank Malette (Williams & Wilkins). Reviewed by P. Gerhardt.

Religion, Philosophy and Psychical Research, C. D. Broad (Harcourt, Brace). Reviewed by F. P. Clarke.

Music Therapy, E. Podolsky, Ed. (Philosophical Library). Reviewed by P. R. Farnsworth.

Pattern of the Tiger, Stanwell Fletcher (Little, Brown). Reviewed by D. Bidney.

Organic Chemistry, Robert Ward Getchell (McGraw-Hill). Reviewed by C. A. VanderWerf.

Plant Breeding for Everyone, John Y. Beaty (Charles T. Branford). Reviewed by G. W. Dillon.

Practical Chromatography, R. C. Brimley and F. C. Barrett (Reinhold; Chapman & Hall); *Chromatographic Methods of Inorganic Analysis*, F. H. Pollard, and J. F. W. McOmie (Academic Press; Butterworths). Reviewed by J. H. Yge.

Man, Rockets and Space, Burr W. Leyson (Dutton). Reviewed by H. S. Tsien.

Viruses, Cold Spring Harbor Biological Laboratory. Reviewed by G. H. Bergold.

A History of The College of Pharmacy, Columbia University, Charles W. Ballard (Columbia Univ. Press). Reviewed by G. L. Jenkins.

The Hand Produced Book, David Diringer (Philosophical Library). Reviewed by J. Holmes.

Industrial Electronics, R. Kretzmann (Philips Technical Library; Elsevier). Reviewed by B. R. Gossick.