

exists a cube with the diameter $c = f(a, b)$ such that one can put all the given bodies in it disjointly.

Corollary. One kilogram of potatoes can be put into a finite sack.

PROBLEM. Determine the function $c = f(a, b)$.

59. CAN ONE DECOMPOSE a square into a finite number of squares all different?

The commentary accompanying Problem 59 occupies eight pages. It gives a history of the question, several solutions, and many references to the literature.

123. GIVEN ARE THREE SETS A_1, A_2, A_3 located in the 3-dimensional Euclidean space and with finite Lebesgue measure. Does there exist a plane cutting each of the three sets A_1, A_2, A_3 into two parts of equal measure? The same for n sets in the n -dimensional space.

This is the celebrated "Ham Sandwich Theorem": given two slices of bread and a slice of ham, placed perhaps irregularly in space, can you bisect them all with one straight swing of a knife?

147. SUPPOSE THAT A BILLIARD ball issues at the angle 45° from a corner of the rectangular table with a rational ratio of the sides. After a finite number of reflections from the cushion will it come to one of the remaining three corners?

As an instance of the craft of making books this volume is egregiously bad. Even a casual leafing through it will reveal many typographical errors, some funny, some serious. On at least one occasion Lwów misses its accent and Wrocław is misspelled, "probablistic" is not a word, on p. 124 there is a reference to "pp. 000-000," I have no idea what a "homoie class" means in Problem 58, the long commentary on Problem 59 (mentioned above) is unsigned (all others are signed), in one instance the name of a frequent commentator, Diestel, comes out Dieztel—these, and several others like them, are the errors that jumped to my eye without my making any effort to proofread. The "Contents" lists "The Scottish book problems" as one entry (which covers pp. 63-268), and there is no index. In a book like this one, that lack is maximally inconvenient: a problem, solution, comment, or reference once lost is likely to remain unfound through maddening ruffles.

We problem aficionados should and do welcome the book with open arms nevertheless. We can't help feeling that we deserve better, and surely we have grounds for grumbling, but we would rather have the book, faults and all, than not have it.

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American Cactaceae

The Cacti of the United States and Canada.

LYMAN BENSON. Line drawings by Lucretia Breazeale Hamilton. Stanford University Press, Stanford, Calif., 1982. xii, 1044 pp., illus. \$85.

This large, comprehensive, well-written book is the culmination of a lifetime of study and research on cacti conducted in the field, in gardens, and in herbaria. The numerous excellent illustrations, including photographs both in color and in black and white and line drawings, will make it particularly appealing and useful to amateurs, and the keys to genera and species, distribution maps, descriptions, and documentation should satisfy the most discriminating professional taxonomists.

The first quarter of the book provides background information that enhances the reader's knowledge of cacti and the problems involved in identifying and classifying them. Included are sections that deal with structure, physiology, chemistry, distribution, floristic associations and ecology, uses, endangered species, and conservation. Students wishing

to pursue fieldwork on cacti will appreciate the detailed directions given for the preparation of herbarium specimens and the proper documentation of collections. Benson discusses the enormous variability that characterizes many groups of cacti and its relationship to environmental and genetic factors, including hybridization. All of this relates to the establishment of a policy and taxonomic philosophy that will allow species, varieties, and hybrids to be usefully and consistently delimited—no easy task in the Cactaceae. Because few groups and populations have been intensively studied, Benson adopts a conservative approach that may not meet the approval of those who like to erect taxa on the basis of a few simple characters, a procedure that has resulted in a proliferation of cactus genera and species that are poorly documented and of doubtful validity. Instead of accepting many taxa as species, he presents cogent arguments for reducing them to varietal rank and for using lists of characters rather than simple keys to separate the varieties. The number of genera described by Britton and Rose and others for the area under consideration has been reduced. For example,



"Cactus planting in the Huntington Botanical Gardens, San Marino, California." [From *The Cacti of the United States and Canada*]

Carnegiea, *Lemaireocereus*, *Peniocereus*, *Acanthocereus*, and *Wilcoxia* are returned to the large collective genus *Cereus* pending further investigations. On the other hand, Benson's own intensive field studies have led him to accept *Sclerocactus* and *Pediocactus* as valid genera after assigning *Coloradoa* to the former and *Utahia*, *Navajoa*, and *Toumeyia* to the latter. The genus *Coryphantha*, placed in *Mammillaria* in early editions of the author's *Cacti of Arizona*, represents another example of changes that can be justified as information accumulates. The system of classification as a whole is therefore flexible rather than static.

The systematic section that makes up three-quarters of the volume contains the keys, descriptions, and distribution maps required for the identification of unknown plants. It is profusely illustrated with photographs and line drawings of exceptional quality; the descriptions are often followed by additional comments on ecology or distribution or comparisons with closely related taxa. In the interests of easier reading, documentation and synonymy are relegated to a section at the end of the book, where there are also a glossary and an extensive list of references. The system of classification so carefully developed by Benson and exemplified in this work will be the standard for many years to come.

This long-awaited book is the definitive publication for the cacti of North America north of Mexico. The scholarship and care involved in its preparation and the high quality of the printing and illustrations make it indispensable for anyone interested in cacti.

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Books Received

The Abilities and Achievements of Orientals in North America. Philip E. Vernon. Academic Press, New York, 1982. xiv, 322 pp. \$29.50. Personality and Psychopathology.

Abusing Science. The Case Against Creationism. Philip Kitcher. MIT Press, Cambridge, Mass., 1982. x, 214 pp. \$15.

Acid-Base Physiology. A Direct Approach. James L. Gamble, Jr. Johns Hopkins University Press, Baltimore, 1982. xviii, 124 pp., illus. \$11.50.

ADA: A Programmer's Conversion Course. M. J. Stratford-Collins. Ellis Horwood, Chichester, England, and Halsted (Wiley), New York, 1982. 170 pp. \$48.95.

Advances in Transport Processes. Vol. 2. Arun S. Mujumdar and R. A. Mashelkar, Eds. Halsted (Wiley), New York, 1982. xiii, 432 pp., illus. \$37.95.

All in the Mind. Reincarnation, Hypnotic Regression, Stigmata, Multiple Personality, and Other Little-Understood Powers of the Mind. Ian Wilson. Doubleday, Garden City, N.Y., 1982. xx, 268 pp., illus. \$15.95.

Basic Aspects of Microcirculation. Proceedings of a symposium, Tokyo, July 1981. Masaharu Tsuchiya,

Makishige Asano, and Masaya Oda, Eds. Excerpta Medica, Amsterdam, 1982 (U.S. distributor, Elsevier, New York). xvi, 376 pp., illus. \$93. International Congress Series, No. 578.

Basidium and Basidiocarp. Evolution, Cytology, Function, and Development. Kenneth Wells and Ellnor K. Wells, Eds. Springer-Verlag, New York, 1982. xii, 188 pp., illus. \$36.80. Springer Series in Microbiology.

Behavioral and Social Science Research. A National Resource. Part 1. Robert McC. Adams, Neil J. Smelser, and Donald J. Treiman, Eds. National Academy Press, Washington, D.C., 1982. xiv, 122 pp., illus. Paper, \$9.95.

Biochemistry and Physiology of Herbicide Action. Carl Fedtke. Springer-Verlag, New York, 1982. xii, 202 pp., illus. \$68.

Biological Electrochemistry. Vol. 1. Glenn Dryhurst, Karl M. Kadish, Frieder Scheller, and Reinhard Renneberg. Academic Press, New York, 1982. xii, 548 pp., illus. \$74.

Biological Mineralization and Demineralization. Papers from a workshop, Berlin, Oct. 1981. G. H. Nancollas, Ed. Springer-Verlag, New York, 1982. viii, 418 pp., illus. \$23. Dahlem Workshop Reports. Life Sciences Research Report 23.

Biological Rhythms, Sleep, and Performance. Wilse B. Webb, Ed. Wiley, New York, 1982. xvi, 280 pp., illus. \$34.95. Wiley Series on Studies in Human Performance.

The Biology of Race. James C. King. University of California Press, Berkeley, ed. 2, 1982. x, 180 pp., illus. Cloth, \$15.95; paper, \$6.95.

Biostatistics in Medicine. Edmund A. Murphy. Johns Hopkins University Press, Baltimore, 1982. xviii, 542 pp., illus. \$37.50.

Brain Tumors in the Chemical Industry. Proceedings of a workshop, New York, Oct. 1980. Irving J. Selikoff and E. Cuyler Hammond, Eds. New York Academy of Sciences, New York, 1982. xii, 364 pp., illus. Cloth or paper, \$75. Annals of the New York Academy of Sciences, vol. 381.

Carbohydrate Intolerance in Infancy. Papers from a symposium, Key Largo, Fla., Jan. 1982. Fima Lifshitz, Ed. Dekker, New York, 1982. xiv, 256 pp., illus. \$35. Clinical Disorders in Pediatric Nutrition, vol. 1.

The Cell Biology of the Testis. Proceedings of a conference, New York, Apr. 1981. C. Wayne Bardin and Richard J. Sherins, Eds. New York Academy of Science, New York, 1982. xii, 544 pp., illus. Cloth or paper, \$97. Annals of the New York Academy of Sciences, vol. 383.

Covalent Catalysis by Enzymes. Leonard B. Spetor. Springer-Verlag, New York, 1982. xii, 276 pp., illus. \$32.90.

Current Developments in Anthropological Genetics. Vol. 2, Ecology and Population Structure. Michael H. Crawford and James H. Mielke, Eds. Plenum, New York, 1982. xviii, 526 pp., illus. \$59.50.

Cyclic and Event Stratification. Papers from a workshop, Tübingen, Germany, Apr. 1980. G. Einsele and A. Seilacher, Eds. Springer-Verlag, New York, 1982. xiv, 536 pp., illus. Paper, \$29.50.

Cycling of Carbon, Nitrogen, Sulfur and Phosphorus in Terrestrial and Aquatic Ecosystems. Papers from a workshop, Canberra, Australia, Apr. 1981. J. R. Freney and I. E. Galbally, Eds. Springer-Verlag, New York, 1982. vi, 154 pp., illus. \$38.

Cytopheresis and Plasma Exchange. Clinical Indications. Proceedings of a symposium, Atlanta, Ga., Mar. 1980. W. R. Vogler, Ed. Liss, New York, 1982. xvi, 318 pp., illus. \$334. Progress in Clinical and Biological Research, vol. 88.

Developmental Order. Its Origin and Regulation. Proceedings of a symposium, Boulder, Colo., June 1981. Stephen Subtelny and Paul B. Green, Eds. Liss, New York, 1982. xviii, 564 pp., illus. \$68.

The Diabetes Fact Book. Theodore G. Duncan. Scribner, New York, 1982. xiv, 146 pp. \$11.95. Revised edition of *The Good Life—with Diabetes*.

Diagnostic Techniques and Clinical Questions. W. Straub, Ed. Karger, Basel, 1982. viii, 138 pp., illus. \$69. Developments in Ophthalmology, vol. 6.

Disposition of Toxic Drugs and Chemicals in Man. Randall C. Baselt. Biomedical Publications, Davis, Calif., ed. 2, 1982. xviii, 796 pp., illus. \$49.50.

Distributed Computer Control Systems 1981. Proceedings of a workshop, Beijing, Aug. 1981. William E. Miller, Ed. Published for the International Federation of Automatic Control by Pergamon, New York, 1982. xx, 168 pp., illus. \$50. IFAC Proceedings Series.

Division of Labor. A Political Perspective. Elliott A. Krause. Greenwood, Westport, Conn., 1982. xvi, 204 pp. \$27.50. Contributions in Labor History, no. 12.

Handbook of Conservation and Solar Energy. Trends and Perspectives. V. Daniel Hunt, Van Nostrand Reinhold, New York, 1982. xxii, 386 pp., illus. \$39.50.

Handbook of Measurement Science. Vol. 1. Theoretical Fundamentals. P. H. Sydenham, Ed. Wiley-

Interscience, New York, 1982. xxiv, 654 pp., illus. \$65.

Handbook of Ozone Technology and Applications. Vol. 1. Rip G. Rice and Aharon Netzer, Eds. Ann Arbor Science (Butterworth), Ann Arbor, Mich., 1982. x, 386 pp., illus. \$39.95.

The Health of China. Ruth Sidel and Victor W. Sidel with a chapter by Mark Sidel. Beacon Press, Boston, 1982. xx, 252 pp. \$13.50.

The Hedonistic Neuron. A Theory of Memory, Learning, and Intelligence. A. Harry Klopff. Hemisphere, Washington, D.C., 1982. xx, 140 pp. Paper, \$19.95.

Herpesvirus. Clinical, Pharmacological and Basic Aspects. Proceedings of a symposium, Tokushima City, Japan, July 1981. Hiroshi Shiota, Yung-Chi Cheng, and William H. Prusoff, Eds. Excerpta Medica, Amsterdam, 1982 (U.S. distributor, Elsevier, New York). xvi, 460 pp., illus. \$97.75.

High Resolution Spectroscopy. J. Michael Hollas. Butterworth, Boston, 1982. xvi, 638 pp., illus. \$115.

High-Temperature Superconductivity. V. L. Ginzburg and D. A. Kirzhnits, Eds. Translated with revisions from the Russian edition (Moscow, 1977). A. K. Agyei, Transl. Joseph L. Birman, Transl. Ed. Consultants Bureau (Plenum), New York, 1982. xvi, 364 pp., illus. \$55.

A History of Early Jewish Physicians in the State of Michigan. Irving I. Edgar. Philosophical Library, New York, 1982. 250 pp., illus. \$15.

History of Polymer Science and Technology. Papers from a symposium, Mar. 1980. Raymond B. Seymour, Ed. Dekker, New York, 1982. x, 410 pp., illus. \$65. Reprinted from *Journal of Macromolecular Science-Chemistry*, vol. A15, Nos. 6 and 7.

Hohokam and Patayan. Prehistory of Southwestern Arizona. Randall H. McGuire and Michael B. Schiffer, Eds. Academic Press, New York, 1982. xxvi, 658 pp., illus. \$39.50.

Hormone Receptors. L. D. Kohn, Ed. Wiley, New York, 1982. xii, 392 pp., illus. \$67.95. Horizons in Biochemistry and Biophysics, vol. 6.

Immunological Factors in Human Reproduction. Proceedings of a symposium Rome, Mar. 1981. Sidney Shulman, Franco Dondero, and Maria Nicotra, Eds. Academic Press, New York, 1982. xiv, 254 pp. \$39.50. Proceedings of the Sero Symposium, vol. 45.

Medical Microbiology. Samuel Baron and Lynn M. Alperin, Eds. Addison-Wesley Medical/Nursing Division, Menlo Park, Calif., 1982. xxx, 952 pp., illus. \$29.95.

Melanoma Antigens and Antibodies. Ralph A. Reisfeld and Soldano Ferrone, Eds. Plenum, New York, 1982. xviii, 446 pp., illus. \$49.50.

The Menopause. Clinical, Endocrinological and Pathophysiological Aspects. Proceedings of a meeting. P. Fioretti, L. Martini, G. B. Melis, and S. S. C. Yen, Eds. Academic Press, New York, 1982. xxii, 584 pp., illus. \$74.50. Proceedings of the Sero Symposium, vol. 39.

Metabolic Basis of Detoxication. Metabolism of Functional Groups. William B. Jakoby, John R. Bend, and John Caldwell, Eds. Academic Press, New York, 1982. xvi, 376 pp., illus. \$42.

Music, Mind, and Brain. The Neuropsychology of Music. Manfred Clynes, Ed. Plenum, New York, 1982. xiv, 430 pp., illus., + sound sheet. \$39.50.

Mutagenicity. New Horizons in Genetic Toxicology. John A. Heddle, Ed. Academic Press, New York, 1982. xvi, 474 pp., illus. \$55. Cell Biology.

Mutation, Promotion and Transformation in Vitro. Proceedings of a symposium, Tokyo, Dec. 1980. Naomichi Inui, Toshio Kuroki, Masa-Atsu Yamada, and Charles Heidelberger, Eds. Japan Scientific Societies Press, Tokyo, 1981 (U.S. distributor, ISBS, Beaverton, Ore.). viii, 246 pp., illus. \$40. GANN Monograph on Cancer Research no. 27.

Neurology. Proceedings of a meeting, Kyoto, Sept. 1981. Shibanosuke Katsuki, Tadao Tsubaki, and Yasuo Toyokura, Eds. Excerpta Medica, Amsterdam, 1982 (U.S. distributor, Elsevier, New York). x, 450 pp., illus. \$121.

Neuronal Development. Nicholas C. Spitzer, Ed. Plenum, New York, 1982. xxiv, 424 pp., illus. \$45. Current Topics in Neurobiology.

Nitrogen Cycling in South-East Asian Wet Monsoonal Ecosystems. Papers from a meeting, Chiang Mai, Thailand, Nov. 1979. R. Wetselaar, J. R. Simpson, and T. Rosswall, Eds. Australian Academy of Science, Canberra, 1981. viii, 216 pp., illus. A\$25.

Nitrogen, Public Health, and the Environment. Some Tools for Critical Thought. John H. Timothy Winneberger. Ann Arbor Science (Butterworth), Ann Arbor, Mich., 1982. xvi, 78 pp. \$14.95.

NMR Imaging in Biomedicine. Supplement 2. Advances in Magnetic Resonance. P. Mansfield and P. G. Morris. Academic Press, New York, 1982. x, 354 pp., illus. \$49.50. Advances in Magnetic Resonance.

Observatories of the World. Siegfried Marx and Werner Pfau. Van Nostrand Reinhold, New York, 1982. 200 pp., illus. \$16.95.

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