

or are irritatingly difficult to read because of line fade-out. Photomicrographs throughout the book are so washed out as to defy interpretation, and a number of diagrams are crudely reproduced. Taxonomic terms are abundantly misused, and there are many spelling and grammatical errors, betraying a less than exemplary commitment to detail in the assembly of the volume. But despite its collective shortcomings this is a worthy effort and a valuable reference, though one that does not quite live up to expectations.

J. F. Williams
Department of Microbiology,
Michigan State University,
East Lansing, MI 48824

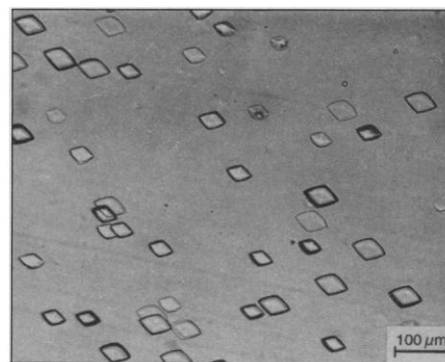
A Revealing Tool

Fission-Track Dating. GÜNTHER WAGNER and PETER VAN DEN HAUTE. Enke, Stuttgart, and Kluwer, Norwell, MA, 1992. xiv, 285 pp., illus. \$99. Solid Earth Sciences Library, vol. 6. Based on a workshop, Besançon, France, Sept. 1988.

During the past 30 years the fission-track dating technique, which is based on the rate of spontaneous fission of ^{238}U in ura-

nium-bearing minerals, has been applied to a number of geologically interesting problems. In a few special cases, this technique can be used to determine the absolute ages of rock units. However, the most exciting application of the method is in deciphering thermal history information. In particular, the analysis of fission-track data from the mineral apatite, which records the thermal history of rocks in the 60° to 140°C range, has routinely been used to evaluate the hydrocarbon potential of sedimentary basins and to determine the uplift and erosional history of mountain ranges. Tremendous advances in the quantitative interpretation of fission-track data have occurred in the last decade. *Fission-Track Dating* is the first comprehensive discussion of the principles, methodology, and applications of fission-track dating since Fleischer, Price, and Walker's classic work *Nuclear Tracks in Solids: Principles and Applications* was published in 1975.

The book is aimed primarily at students and nonspecialists interested in learning about the fission-track technique. Although it focuses on geological applications of the method, one section at the end of the last chapter is devoted to uses in archeology. In general the book is well organized, although the inclusion of a brief overview of the steps involved in fission-track analysis at the end of the first chapter might have



"Spontaneous fission tracks in muscovite after etching in 40% [hydrofluoric acid] for 15 h at 25°C." [From *Fission-Track Dating*]

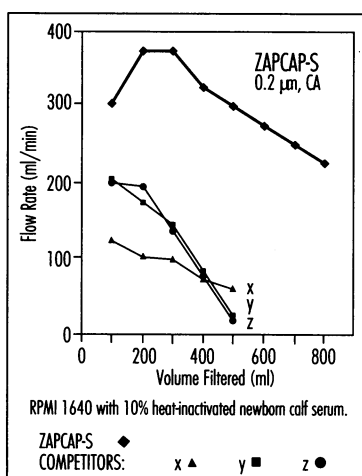
made the detailed discussions in the subsequent chapters more clear to the nonspecialist. The analyses of the principles behind the method, the steps involved in age determination and track length measurement, the methods used to quantify fission-track annealing, and the assumptions used in geological interpretation are drawn from the considerable experience of the authors and from work done by others in fission-track laboratories around the world. The book ends with a number of application case studies from a wide variety of geological situations, including the absolute dating of tuffs, measurement of rates of uplift and



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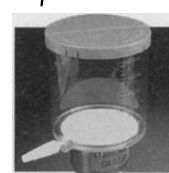
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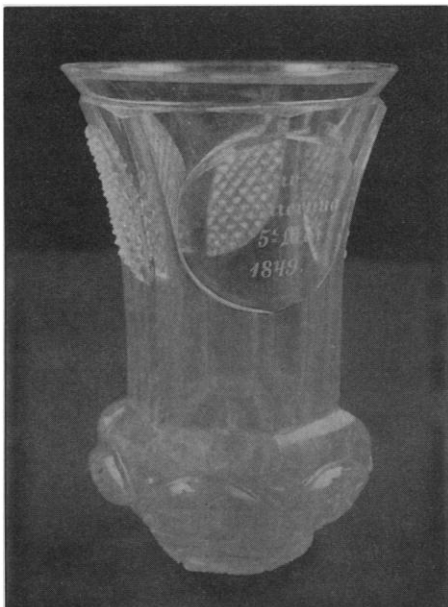
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"Uranium glass from Bohemia. Due to high uranium content (ca. 1%) such glasses may be readily dated by fission tracks." [From *Fission-Track Dating*]

erosion of mountain belts and basement, determination of thermal evolution of basins and ore deposits, dating of meteoroid impacts, and dating of sea-floor basalts.

This volume would make a suitable supplemental textbook for an isotope geology or tectonic analysis course. Moreover, the specialist will find it to be a handy reference, as the bibliography is reasonably complete through early 1991. The chapter about the etching and stability of fission tracks in a variety of geological materials is especially interesting and thorough. In addition to discussing the minerals commonly used in fission-track dating (apatite, zircon, glass, mica, and sphene), the authors put forth suggestions for further work on a number of other minerals, such as calcite and epidote, that may have important geological applications.

Shari A. Kelley
Department of Geological Sciences,
Southern Methodist University,
Dallas, TX 75275

Reprints of Books Previously Reviewed

A Convergence of Lives. Sofia Kovalevskaja: Scientist, Writer, Revolutionary. Ann Hibner Koblitz. Rutgers University Press, New Brunswick, NJ, 1993. Paper, \$13.95. *Reviewed* 224, 726 (1984).

German National Socialism and the Quest for Nuclear Power, 1939–1949. Mark Walker. Cambridge University Press, New York, 1993. Paper, \$13.95. *Reviewed* 249, 570 (1990).

The Logic of Life. A History of Heredity. François

Jacob. Princeton University Press, 1993. Paper, \$12.95. *Original French edition reviewed* 172, 364 (1971).

The Mathematical Theory of Black Holes. S. Chandrasekhar. Oxford University Press, New York, 1993. Paper, \$49.95. *Reviewed* 222, 1116 (1983).

The Outer Circle. Women in the Scientific Community. Harriet Zuckerman, Jonathan R. Cole, and John T. Bruer, Eds. Yale University Press, New Haven, CT, 1993. Paper, \$18. *Reviewed* 254, 445 (1991).

Scribes, Warriors and Kings. The City of Copán and the Ancient Maya. William L. Fash. Barbara W. Fash, illustrator. Thames and Hudson, New York, 1993 (U.S. distributor, Norton, New York). Paper, \$19.95. *Reviewed* 256, 1062 (1992).

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Advances in Coleopterology. Mario Zunino, Xavier Bellés, and Marina Blas, Eds. European Association of Coleopterology, Barcelona, 1991. 323 pp., illus. Paper, 7000 Ptas. Based on a congress, Barcelona, Sept. 1989.

Aging and Cellular Defense Mechanisms. Claudio Franceschi *et al.*, Eds. New York Academy of Sciences, New York, 1992. xii, 526 pp., illus. Paper, \$150. Annals of the New York Academy of Sciences, vol. 663. From a conference, Modena, Italy, Sept. 1991.

Agricultural Ecosystem Effects on Trace Gases and Global Climate Change. G. A. Peterson *et al.*, Eds. American Society of Agronomy, Madison, WI, Crop Science Society of America, Madison, WI, and Soil Science Society of America, Madison, WI, 1993. xviii, 206 pp., illus. Paper, \$30. ASA Special Publication no. 55. From a symposium, Denver, Oct. 1991.

AIDS. Effective Health Communication for the 90s. Scott C. Ratzan, Ed. Taylor and Francis, Philadelphia, 1993. xxviii, 268 pp., illus. \$39.50.

Alien Plant Invasions in Native Ecosystems of Hawaii. Management and Research. Charles P. Stone, Clifford W. Smith, and J. Timothy Tunison, Eds. University of Hawaii Cooperative National Park Resources Studies Unit, Honolulu, 1992 (distributor, University of Hawaii Press, Honolulu). xvi, 887 pp., illus. \$60. Based on a symposium, 1986.

American Apartheid. Segregation and the Making of the Underclass. Douglas S. Massey and Nancy A. Denton. Harvard University Press, Cambridge, MA, 1993. xii, 292 pp. \$29.95.

The American Southwest and Mesoamerica. Systems of Prehistoric Exchange. Jonathon E. Ericson and Timothy G. Baugh, Eds. Plenum, New York, 1993. xviii, 302 pp., illus. \$45. Interdisciplinary Contributions to Archaeology.

Analytical Population Dynamics. T. Royama. Chapman and Hall, New York, 1992. xvi, 371 pp., illus. \$49.50. Population and Community Biology Series.

Anatomy of Flowering Plants. An Introduction to Structure and Development. Paula Rudall. 2nd ed. Cambridge University Press, New York, 1992. x, 110 pp., illus. Paper, \$19.95.

Annals Index 1988/1989. Vance Weaver, compiler. New York Academy of Sciences, New York, 1992. viii, 577 pp. \$40. Annals of the New York Academy of Sciences, vol. 634.

Applications of Network Thermodynamics to Problems in Biomedical Engineering. Donald C. Mikulecky. New York University Press, New York, 1993. xxii, 381 pp., illus. \$70. New York University Monographs in Biomedical Engineering.

Applied Chaos Theory. A Paradigm for Complexity. A. B. Çambel. Academic Press, San Diego, CA, 1993. xviii, 246 pp., illus. \$44.95.

Arthur C. Clarke. The Authorized Biography. Neil McAleer. Contemporary Books, Chicago, IL, 1992. xviii, 430 pp. + plates. \$25.

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Banding Together. The Rise of National Associa-

tions in American Higher Education, 1887–1950. Hugh Hawkins. Johns Hopkins University Press, Baltimore, MD, 1992. xx, 295 pp. \$39.95.

Bargaining for Life. A Social History of Tuberculosis, 1876–1938. Barbara Bates. University of Pennsylvania Press, Philadelphia, 1992. xii, 435 pp., illus. \$45.95; paper, \$19.95. Studies in Health, Illness, and Caregiving in America.

Before the Computer. IBM, NCR, Burroughs, and Remington Rand and the Industry They Created, 1865–1956. James W. Cortada. Princeton University Press, Princeton, NJ, 1993. xxii, 344 pp., illus., + plates. \$55. Princeton Studies in Business and Technology.

The Beria Affair. The Secret Transcripts of the Meetings Signalling the End of Stalinism. D. M. Stickler, Ed. Nova, Commack, NY, 1992. viii, 218 pp. Paper, \$49. Translated from the Russian by Jean Farrow.

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Biological Electron Microscopy. Theory, Techniques, and Troubleshooting. Michael J. Dykstra. Plenum, New York, 1992. xx, 360 pp., illus. \$49.50.

Biomechanics—Materials. A Practical Approach. Julian F. V. Vincent, Ed. Oxford University Press, New York, 1992. xviii, 247 pp., illus. \$70; paper, \$50. Practical Approach Series.

Biosynthesis and Manipulation of Plant Products. Don Grierson, Ed. Blackie Academic (Chapman and Hall), Glasgow, U.K., 1993. x, 253 pp., illus. \$149.95. Plant Biotechnology, vol. 3.

The Changing American Mind. How and Why American Public Opinion Changed Between 1960 and 1988. William G. Mayer. University of Michigan Press, Ann Arbor, 1992. xii, 505 pp. \$49.50; paper, \$18.95.

Chaotic Dynamics. Theory and Practice. T. Bountis, Ed. Plenum, New York, 1992. xii, 418 pp., illus. \$110. NATO Advanced Science Institutes Series B, vol. 298. From an institute, Patras, Greece, July 1991.

Characterization of Materials. John B. Wachtman with Zwi H. Kalman. Manning, Greenwich, CT, and Butterworth-Heinemann, Stoneham, MA, 1993. xvi, 480 pp., illus. \$74.95.

Chemical Signals in Vertebrates 6. Richard L. Doty and Dietland Müller-Schwarze, Eds. Plenum, New York, 1992. xvi, 637 pp., illus. \$125. From a conference, Philadelphia, June 1991.

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Chimpanzee Material Culture. Implications for Human Evolution. W. C. McGrew. Cambridge University Press, New York, 1992. xvi, 277 pp., illus. \$79.95.

Chirality in Industry. The Commercial Manufacture and Applications of Optically Active Compounds. A. N. Collins, G. N. Shelldrake, and J. Crosby, Eds. Wiley, New York, 1992. xvi, 409 pp., illus. \$135.

Chronic Lymphocytic Leukemia. Scientific Advances and Clinical Developments. Bruce D. Cheson, Ed. Dekker, New York, 1993. xvi, 424 pp., illus. \$99.75. Basic and Clinical Oncology, 1.

A Chronological Taxonomy of Conus, 1758–1840. Alan J. Kohn. Smithsonian Institution Press, Washington, DC, 1992. x, 315 pp., illus., + plates. \$45.

The Cleveland Herbal, Botanical, and Horticultural Collections. A Descriptive Bibliography of Pre-1830 Works from the Libraries of the Holden Arboretum, the Cleveland Medical Library Association, and the Garden Center of Greater Cleveland. Stanley H. Johnston, Jr., compiler. Kent State University Press, Kent, OH, 1992. xviii, 1012 pp. + plates. \$85.

Climate Modes of the Phanerozoic. The History of the Earth's Climate Over the Past 600 Million Years. Lawrence A. Frakes, Jane E. Francis, and Jozef I. Syktus. Cambridge University Press, New York, 1992.