be that this statement alone guaranteed the successful cloning of the AT gene which occurred just a few months after the publication of the book (K. Savitsky *et al.*, *Science* **268**, 1749 [1995]). Studies on DNA repair and mutation are indeed proceeding rapidly. What is impressive is how well Friedberg, Walker, and Siede have done in presenting an overall point of view that will remain useful even as new details are added.

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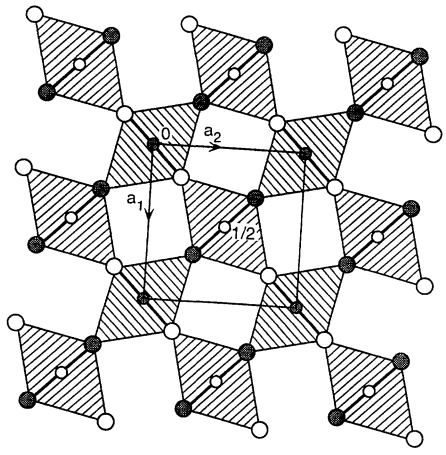
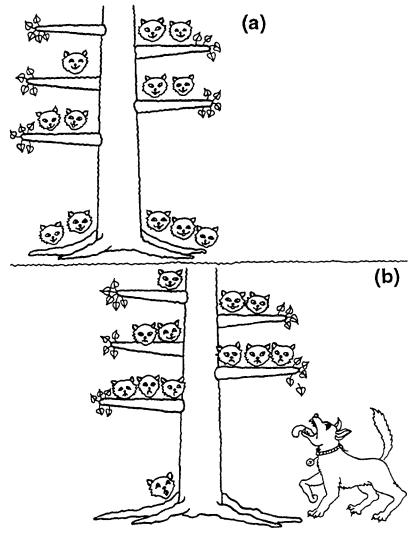
Geocrystallography

Physics and Chemistry of Earth Materials. ALEXANDRA NAVROTSKY. Cambridge University Press, New York, 1994. xiv, 417 pp., illus. $79.95 or £55; paper, $34.95 or £22.95. Cambridge Topics in Mineral Physics and Chemistry, 6.

As new technological materials become increasingly complex in structure and bonding, they are beginning to resemble the materials that make up our planet. Perovskite-type crystals are a case in point, defining the structures of both the high-temperature superconductors and the predominant mineral of the Earth. Such novel materials as fullerenes and chemical-vapor-deposition diamond have even been found in rocks and meteorites millions of years old. Thus materials scientists have more in common with geologists than ever before.



"The structure of rutile, TiO_2. The tetragonal structure consists of edge-sharing chains of TiO_6 octahedra running parallel to the *c*-axis. Octahedra in adjacent chains are joined at their corners. This polyhedral representation is a projection down the *c*-axis, parallel to the chains. The shaded symbols are atoms at a *z*-coordinate of 0, and the open circles are at $z = 1/2$. The unit cell is outlined." [From *Physics and Chemistry of Earth Materials*]



"Schematic of a population inversion. (a) Without an external driving force, the particles (cats) are distributed in the lower-lying energy levels (branches) according to the Boltzmann distributions. (b) With external pumping of energy (dog), the particles populate higher energy states (higher branches) more than lower ones. Lasing action may be likened to an upper branch breaking, returning its occupants to their ground state in a coherent pulse." [*From Physics and Chemistry of Earth Materials*]

Physics and Chemistry of Earth Materials is a unique monograph at the interface between the disciplines. Written by one of the leaders in combining mineralogical and materials research, it illustrates how basic approaches of materials science, solid-state chemistry, and condensed-matter physics can be used to understand what makes up our planet, and maybe even how it works on the inside. One might characterize the book as "elementary" in that it contains few equations, derivations, or details of the underlying physics. Yet it touches on many of the key concepts, as well as the experimental and theoretical methods used in current materials research.

One of the high points of the book is the extensive chapter on crystal chemistry, which contains a superb discussion of how complex crystal structures are related. The rich diversity of both earthly and superconducting perovskite-like crystals is described, as are defect, modulated, and biopyribole-type structures. Insights attained through years of research are incorporated into these pages, and it is vintage Navrotsky to use spinel as a recurring theme throughout the book: this deceptively simple (cubic) crystal structure accommodates a great variety of complexity, including crystallographic disorder, nonstoichiometry, and variable valences.

The overview of chemical bonding is pleasing in the comparisons made between the "chemist's" (molecular, real space) and "physicist's" (infinite crystal, reciprocal space) traditional approaches, but the discussion of theoretical methods now available is less satisfying; though it is useful to have short definitions of the numerous acronyms plaguing theorists, the underlying approximations are not really clarified. Still, the point is well made that simple geometrical models of crystals, such as ionic radii and Pauling rules, remain useful, even in this day of sophisticated "first-principles" calculations.

I have found that the book can work well with two very different audiences: geology or materials students being introduced to modern methods and concepts of materials science, and the more experienced materials researchers, who can enjoy seeing revealed the close analogies between their work and current studies of our planet.

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Books Received

Advanced Engineering Dynamics. Jerry H. Ginsberg. 2nd ed. Cambridge University Press, New York, 1995. xvi, 462 pp., illus. $74.95.

Advanced Methods of Pharmacokinetic and Pharmacodynamic Systems Analysis. Vol. 2. David Z. D'Argenio, Ed. Plenum, New York, 1995. x, 217 pp., illus. $75. From a workshop, Los Angeles, May 1993.

Beyond Prejudice. The Moral Significance of Human and Nonhuman Animals. Evelyn B. Pluhar. Duke University Press, Durham, NC, 1995. xxi, 371 pp. $49.95; paper, $19.95.

Biochemistry and Molecular Biology of Fishes. Vol. 4, Metabolic Biochemistry. P. W. Hochachka and T. P. Mommsen, Eds. Elsevier, New York, 1995. xiv, 515 pp., illus. $232.25 or Dfl. 395.

Chemists' Views of Imaging Centers. Ali M. Emran, Ed. Plenum, New York, 1995. xiv, 537 pp., illus. $129.50. From a symposium, Chicago, Aug. 1993.

Chernobyl. The Forbidden Truth. Alla Yaroshinskaya. University of Nebraska Press, Lincoln, 1995. xxii, 136 pp., illus. $25; paper, $10. Translated from the Russian by Michèle Kahn and Julia Sallabank. Reprint, 1994 ed.

The Day Before America. William H. MacLeish. Houghton Mifflin, Boston, MA, 1995. x, 277 pp., illus. Paper, $11.95. Reprint, 1994 ed.

Democracy, Dialogue, and Environmental Disputes. The Contested Languages of Social Regulation. Bruce A. Williams and Albert R. Matheny. Yale University Press, New Haven, CT, 1995. xii, 256 pp., illus. $32.50.

The Ecology of the Chernobyl Catastrophe. Scientific Outlines of an International Programme of Collaborative Research. V. K. Savchenko. UNESCO, Paris, and Parthenon, New York, 1995. xx, 200 pp., illus. $85 or £48. Man and the Biosphere, vol. 16.

The Ecology of Tropical Food Crops. M. J. T. Norman, C. J. Pearson, and P. G. E. Searle. 2nd ed. Cambridge University Press, New York, 1995. x, 430 pp., illus. $69.95; paper, $29.95.

Field Penetration and Magnetization of High Temperature Superconductors. Anant Narlikar, Ed. Nova, Commack, NY, 1995. xviii, 445 pp., illus. $97. Studies in High Temperature Superconductors, vol. 14.

Final Report. Advisory Committee on Human Radiation Experiments. U.S. Government Printing Office,

Vignettes: Interpretative Seismology

In southern Chile a legend describes how earthquakes are due to the fights between two big snakes, Cai-cay, mistress of the waters, and Tre-treg, who fills with stones the hole Cai-cay digs to store her waters. Snakes responsible for earth tremors appear in the Greco-Roman tradition and in early medieval Italian palimpsests. In ancient China the winged dragon-snake Lung shook the earth and in India an elephant was believed to be the cause of seismic tremor. A giant bull shook the earth on its horns in the Caucasus and the Hebrews made a bull responsible for their seismic catastrophes, just as the bull of Knossos shook the island of Crete. In Kamchatka, a peninsula off the Siberian coast, earthquakes were believed to be caused by a subterranean dog and in Mexico by a jaguar. A subterranean frog or fish caused the local earthquakes in central Asia and an underworld goddess was the originator of earthquakes in Babylon.

—*Matthys Levy* and *Mario Salvadori*, in *Why the Earth Quakes* (Norton)

Every time there is an earthquake in California, I stare at my fingernails. It is about the only time I have anything like a deep communion with those hardened hunks of clear, dead tissue. As the television shows pictures of bridges collapsed and cars crushed into slabs, I regard those keratin-filled first cousins of hair and silently intone to myself a science writer's mantra:

SanFranciscoismovingnorthwardatthespeedfingernailsgrowinayear.
SanFranciscoismovingnorthwardatthespeedfingernailsgrowinayear.

—*Stephen Strauss*, in *The Sizesaurus* (Kodansha)

Washington, DC, 1995. xii, 925 pp. Paper, $44.

The Gamma Ray Sky with Compton GRO and SIGMA. M. Signore, P. Salati, and G. Vedrenne, Eds. Kluwer, Norwell, MA, 1995. xiv, 421 pp., illus. $192 or £124 or Dfl. 295. NATO ASI Series C, vol. 461. From an institute, Les Houches, France, Jan.–Feb. 1994.

Genes, Blood, and Courage. A Boy Called Immortal Sword. David G. Nathan. Belknap Press of Harvard University Press, Cambridge, MA, 1995. xii, 276 pp., illus. $24.95.

Haemophilus, Actinobacillus*, and *Pasteurella. W. Donachie, F. A. Lainson, and J. C. Hodgson, Eds. Plenum, New York, 1995. viii, 245 pp., illus. $85. From a conference, Edinburgh, July-Aug. 1994.

The Handbook of Brain Theory and Neural Networks. Michael A. Arbib, Ed. MIT Press, Cambridge, MA, 1995. xvi, 1118 pp., illus. $175; until 30 Sept., $150.

The Immortal Fire Within. The Life and Work of Edward Emerson Barnard. William Sheehan. Cambridge University Press, New York, 1995. xiv, 429 pp., illus. $49.95.

The Immune Functions of Epidermal Langerhans Cells. Heidrun Moll. Springer-Verlag, New York, and Landes, Austin, TX, 1995 (distributor, CRC Press, Boca Raton, FL). xvi, 193 pp., illus. $89. Medical Intelligence Unit.

Inside the Tornado. Marketing Strategies from Silicon Valley's Cutting Edge. Geoffrey A. Moore. HarperBusiness, New York, 1995. xii, 244 pp., illus. $25 or $C35.

Keys to Infinity. Clifford A. Pickover. Wiley, New York, 1995. xviii, 332 pp., illus., + plates. $24.95.

Kimberlites, Orangeites, and Related Rocks. Roger Howard Mitchell. Plenum, New York, 1995. xiv, 410 pp., illus. $89.50.

Land Ecology. An Introduction to Landscape Ecology as a Base for Land Evaluation, Land Management and Conservation. Isaak S. Zonneveld. SPB Academic, Amsterdam, 1995. xii, 199 pp., illus. Paper, $43.75.

Leasing the Ivory Tower. The Corporate Takeover of Academia. Lawrence C. Soley. South End Press, Boston, 1995. vi, 204 pp. $40; paper, $13.

Making the Russian Bomb. From Stalin to Yeltsin. Thomas B. Cochran, Robert S. Norris, and Oleg A. Bukharin. Westview, Boulder, CO, 1995. xvi, 318 pp., illus. $55.

Managing Habitats for Conservation. William J. Sutherland and David A. Hill, Eds. Cambridge University Press, New York, 1995. xii, 399 pp., illus., + plates. $84.95; paper, $29.95.

Mantle and Lower Crust Exposed in Oceanic Ridges and in Ophiolites. R. L. M. Vissers and A. Nicolas, Eds. Kluwer, Norwell, MA, 1995. vi, 214 pp., illus. $115 or £72 or Dfl. 155. Petrology and Structural Geology, vol. 6. From a symposium, Strasbourg, Spring 1993.

Naturally-Produced Organohalogens. Anders Grimvall and Ed W. B. de Leer, Eds. Kluwer, Norwell, MA, 1995. xiv, 437 pp., illus. $177.50 or £112.50 or Dfl. 250. Environment and Chemistry, vol. 1. From a conference, Delft, The Netherlands.

The Nature of the Outer Banks. Environmental Processes, Field Sites, and Development Issues, Corolla to Ocracoke. Dirk Frankenberg. University of North Carolina Press, Chapel Hill, 1995. xvi, 157 pp., illus. Paper, $14.95.

Neurobiological and Clinical Consequences of Stress. From Normal Adaptation to Post-Traumatic Stress Disorder. Matthew J. Friedman, Dennis S. Charney, and Ariel Y. Deutch, Eds. Lippincott-Raven, Philadelphia, 1995. xxiv, 551 pp., illus. $129.

Oncogene Techniques. Peter K. Vogt and Inder M. Verma, Eds. Academic Press, San Diego, 1995. xxxii, 703 pp., illus. $99. Methods in Enzymology, vol. 254.

1001 Questions Answered About the Mineral Kingdom. Richard M. Pearl. Dover, New York, 1995. x, 326 pp., illus. Paper, $8.95. Reprint, 1968 ed.

PCR Strategies. Michael A. Innis, David H. Gelfand, and John J. Sninsky, Eds. Academic Press, San Diego, 1995. xvi, 373 pp., illus. $79.95; spiralbound, $39.95.

The Penguins. Spheniscidae. Tony D. Williams. Oxford University Press, New York, 1995. xiv, 295 pp., illus., + plates. $60. Bird Families of the World, 2.

Quantum Communications and Measurement. V. P. Belavkin, O. Hirota, and R. L. Hudson, Eds. Plenum, New York, 1995. xii, 532 pp., illus. $135. From a workshop, Nottingham, UK, July 1994.

Quantum Electrodynamics with Unstable Vacuum. V. L. Ginzburg, Ed. Nova, Commack, NY, 1995. x, 247 pp., illus. $89. Proceedings of the Lebedev Physics Institute, Academy of Sciences of Russia, vol. 220.

Radiation in Our Environment. Walter Lee. Faun, Baltimore, 1995. xvi, 172 pp., illus. Paper, $9.95.

Radiobiological Disasters. Consequences of Accidents at Nuclear Power Stations. E. B. Burlakova, Ed. Nova, Commack, NY, 1995. x, 267 pp., illus. $89. From a conference, Moscow, June 1991.

Satellite Meteorology. An Introduction. Stanley Q. Kidder and Thomas H. Vonder Haar. Academic Press, San Diego, 1995. x, 466 pp., illus. $54.95.

Schneider on Schneider. The Conversion of the Jews and Other Anthropological Stories. David M. Schneider as told to Richard Handler. Duke University Press, Durham, NC, 1995. x, 242 pp. + plates. $44.95; paper, $14.95.

Science and Culture. Popular and Philosophical Essays. Hermann von Helmholtz. David Cahan, Ed. University of Chicago Press, Chicago, 1995. xviii, 418 pp., illus. $52 or £41.50; paper, $17.95 or £14.25.

The Synergy Between Dynamics and Reactivity at Clusters and Surfaces. Louis J. Farrugia, Eds. Kluwer, Norwell, MA, 1995. viii, 368 pp., illus. $184 or £114 or Dfl. 255. NATO ASI Series C, vol. 465. From a workshop, Drymen, UK, July 1994.

T-Cell Receptor Use in Human Autoimmune Diseases. Mark M. Davis and Joel Buxbaum, Eds. New York Academy of Sciences, New York, 1995. xiv, 464 pp., illus. $175. Annals of the New York Academy of Sciences, vol. 756. From a conference, San Diego, April 1994.

Thrips Biology and Management. Bruce L. Parker and Margaret Skinner, Eds. Plenum, New York, 1995. xvi, 636 pp., illus. $145. NATO ASI Series A, vol. 276. From a workshop, Burlington, VT, Sept. 1993.

Understanding Enzymes. Trevor Palmer. 4th ed. Prentice Hall/Ellis Horwood, New York, 1995. xx, 398 pp., illus. Paper, $65.33.

The Universal Turing Machine. A Half-Century Survey. Rolf Herken, Ed. 2nd ed. Springer-Verlag, New York, 1995. xvi, 611 pp., illus. Paper, $49.

Vaccines 95. Molecular Approaches to the Control of Infectious Diseases. Robert M. Chanock *et al.*, Eds. Cold Spring Harbor Laboratory Press, Cold Spring Harbor, NY, 1995. xxii, 441 pp., illus. Paper, $100. From a meeting, Oct. 1994.

Viral Vectors. Gene Therapy and Neuroscience Applications. Michael G. Kaplitt and Arthur D. Loewy, Eds. Academic Press, San Diego, 1995. xxviii, 486 pp., illus. $90; spiralbound, $49.95.

What Is Life? Lynn Margulis and Dorion Sagan. Simon and Schuster, New York, 1995. 208 pp., illus. $40.

Who Will Feed China? Wake-Up Call for a Small Planet. Lester R. Brown. Norton, New York, 1995. 165 pp., illus. $19.95 or $C25.99; paper, $8.95. Worldwatch Environmental Alert.

Why the Earth Quakes. Matthys Levy and Mario Salvadori. Norton, New York, 1995. 215 pp., illus. $25.

"You Do Teach Atoms, Don't You?" A Case Study in Breaking Science Curricclum Gridlock. Lyman Lyons and Susan Bolyard Millar. LEAD Center, Madison, WI, 1995. xii, 79 pp., illus. Paper, $10.

Publishers' Addresses

Below is information about how to direct orders for books reviewed in this issue. A fuller list of addresses of publishers represented in *Science* appears in the issue of 26 May 1995, page 1220.

ASM (American Society for Microbiology) Press, 1325 Massachusetts Ave., NW, Washington, DC 20005. Phone: 202-737-3600. Fax: 202-942-9342.

Cambridge University Press, 110 Midland Ave., Port Chester, NY 10573–4930. Phone: 800-872-7423; 914-937-9600. Fax: 914-937-4712.