display devices (such as the surface-stabilized ferroelectric liquid crystal device, or SSFLC, invented by Clark and Lagerwall) but various kinds of optoelectrical devices, switches, and shutters now undergoing testing.

Ferroelectric Liquid Crystals is intended to guide the reader through the basic physics and chemistry of the smectic C* phase to the rather complicated structures and experimentation currently used in the development of applications. The contributions to the book, which consists of six sections mainly with different authorship, have three basic themes (although they are not organized this way): the physics of the phase itself and its applications (described in two sections by Clark and Lagerwall), the chemistry in relation to physical properties (discussed in detail by Goodby and in more general terms by Yoshino and Sakurai), and some theoretical issues (treated briefly in the sections by Pikin and Osipov and by Žekš and Blinc).

In their introduction to the physics of the smectic C* phase and to SSFLCs, Clark and Lagerwall focus on simple concepts (such as the Ginzburg-Landau description) and models (such as molecular models relating tilt angle to polarization) rather than attempt mathematical rigor. They begin with the fundamental properties of the smectic C and the chiral C* phase, including their general electric behavior, and then narrow their discussion to SSFLCs, a focus of their research, providing a (somewhat shortcut) review of the history of the subject and an extended exposition of the complicated local structures in SSFLC cells. The discussion covers the layer structures and the optical and electro-optical properties of the cells. Possible applications and questions of practical concern such as matrix addressing, wave-form influence, gray scale, and colors are discussed in their second section (though developments later than 1988 are not covered). In addition, the electroclinic effect in the smectic A phase of the chiral molecules, which has recently attracted new interest, is treated briefly.

The section by Goodby on the microscopic aspects and chemistry of the smectic C* and related phases has the character of a monograph. It does not deal at all with the synthesis of the molecules but explains in a comprehensive and self-contained way what is known about the relationship between the chemical composition and the physical properties of the phases. Goodby takes a rather critical approach and not only gives the rules of thumb but discusses the exceptions to them. He also provides an introduction to the phase behavior of liquid crystals in general, though only chiral smectic phases are discussed in detail, and an analysis of the sometimes misleading nomenclature used in the field (such as the word "ferroelectric" itself). The structures of various chemical moieties that can give rise to chiral smectic phases are also covered. These are contrasted and related to the macroscopic properties of the phase, with special emphasis on optical (optical activity, twist sense, birefringence, and optical tilt) and electrical properties (polarization and its magnitude, sign, and temperature dependence). Goodby concludes his section with chapters on peculiarities of mixtures, which are important to applications, and the identification and alignment (orientation) of a chiral smectic phase, which are prerequisite to any investigation. Without doubt, this part of the book fulfills the interdisciplinary requirements of the field well and with its extensive tables and figures will also serve as a reference for those working on applications. The information here is augmented in the section by Yoshino and Sakurai, who provide data on phase sequences, transition temperatures, and some electrical properties of various chemical compounds.

Two sections on the theory of chiral phases (Pikin and Osipov on the general theory and Žekš and Blinc on the effect of electrical and magnetic fields) are disappointing. On the phenomenological level they focus exclusively on the Ginzburg-Landau approach, which is described elsewhere in the book, and ignore any other type of description, and they essentially reproduce older papers by the authors without any noticeable attempt to adapt them for a broader readership. The microscopic aspects are described in one of Pikin and Osipov's chapters by using the statistical mechanics approach developed mainly by the Dutch school. It conveys the (correct) impression that there is still no realistic microscopic model that can accurately reproduce all the electrical properties of the chiral phase. Here the citation is out of sequence and some references are never cited in the text.

Overall, this book serves its intended purpose (with some restrictions on the theoretical side). It reflects the state of the art as of 1990 and focuses on classical smectic C* phases without digressing too much into more exotic phases or polymeric systems.

Harald Pleiner
Department of Physics,
University of Essen,
D 4300 Essen 1, Germany

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Books Received

AIDS and Accusation. Haiti and the Geography of Blame. Paul Farmer. University of California Press, Berkeley, 1992. xiv, 339 pp. $35. Comparative Studies of Health Systems and Medical Care, vol. 33.

AIDS and Other Manifestations of HIV Infection. Gary P. Wormser, Ed. 2nd ed. Raven, New York, 1992. xxiv, 715 pp., illus. $130.

AIDS and Women's Reproductive Health. Lincoln C. Chen *et al.*, Eds. Plenum, New York, 1992. viii, 208 pp. $65. Reproductive Biology. From a workshop, Bellagio, Italy, Oct. 1990.

AIDS in the Industrialized Democracies. Passions, Politics, and Policies. David L. Kirp and Ronaid Bayer, Eds. Rutgers University Press, New Brunswick, NJ, 1992. xiv, 393 pp., illus. $45; paper, $16.

AIDS Research in the Netherlands. Published for the Dutch Program Committee for AIDS Research by Amsterdam University Press, Amsterdam, 1992. viii, 213 pp., illus. Paper. Prepared for distribution at the eighth international AIDS conference. Describes the programs of some 20 Dutch institutions.

Alexanderson. Pioneer in American Electrical Engineering. James E. Brittain. Johns Hopkins University Press, Baltimore, MD, 1992. xviii, 384 pp., illus. $45. Johns Hopkins Studies in the History of Technology.

Amazon Healer. The Life and Times of an Urban Shaman. Marlene Dobkin de Rios. Unity, Lindfield, Australia, and Prism, Bridport, U.K., 1992 (U.S. distributor, Avery, Garden City Park, NY). viii, 180 pp., illus. Paper, $10.95.

Biological Effects of Static Magnetic Fields. A Review. Nancy J. Simon. International Cryogenic Materials Commission, Boulder, CO, 1992. x, 284 pp., illus. Paper, $50.

The Biomarker Guide. Interpreting Molecular Fossils in Petroleum and Ancient Sediments. Kenneth E. Peters and J. Michael Moldowan. Prentice-Hall, Englewood Cliffs, NJ, 1992. xvi, 363 pp., illus. $56.

Biomarkers. Biochemical, Physiological, and Histological Markers of Anthropogenic Stress. Robert J. Huggett *et al.*, Eds. Lewis, Chelsea, MI, 1992. xviii, 347 pp., illus. $69.95. Society of Environmental Toxicology and Chemistry Publications Series. From a workshop, Keystone, CO, July 1989.

Biomembrane Structure and Function. The State of the Art. Bruce P. Gaber and K. R. K. Easwaran, Eds. Adenine Press, Schenectady, NY, 1992. x, 386 pp., illus. $95. From a workshop, Bangalore and Hyderabad, India, Jan. 1991.

Biotechnology: Economic and Social Aspects. Issues for Developing Countries. E. J. Da Silva, C. Ratledge, and A. Sasson, Eds. Cambridge University Press, New York, 1992. ix, 388 pp., illus. $90.

The BIRPS Atlas. Deep Seismic Reflection Profiles around the British Isles. Simon Klemperer and Richard Hobbs. Cambridge University Press, New York, 1992. iv, 124 pp., illus., + maps, boxed. $150.

Coastal Dunes. Geomorphology, Ecology and Management for Conservation. R. W. G. Carter, T. G. F. Curtis, and M. J. Sheehy-Skeffington, Eds. Balkema, Brookfield, VT, 1992. xii, 533 pp., illus. $90. From a congress, Galway, Ireland, June 1992.

Codes of Evolution. The Synaptic Language Explaining Matter, Life, and the Thought Process. Rush W. Dozier, Jr. Crown, New York, 1992. viii, 282 pp., illus. $20.

Combining Information. Statistical Issues and Opportunities for Research. Commission on Physical Sciences, Mathematics and Applications. National Academy Press, Washington, DC, 1992. xii, 217 pp., illus. Paper, $28.

Comparable Worth. Theories and Evidence. Paula England. Aldine de Gruyter, Hawthorne, NY, 1992. xii, 346 pp., illus. $46.95; paper, $22.95. Social Institutions and Social Change.

Computer Assisted Modeling on the IBM 3090. The 1989 IBM Contest Prize Papers. Keith R. Billingsley, Hilton U. Brown, III, and Ed Derohanes, Eds. Baldwin Press, University of Georgia, Athens, 1992. 2 vols. xxiv, 980 pp., illus. Paper, $77.

The Concept of Function. Aspects of Epistemology and Pedagogy. Ed Dubinsky and Guershon Harel, Eds. Mathematical Association of America, Washington, DC, 1992. xiv, 333 pp., illus. Paper, $22. MAA Notes, vol. 25. Based on a conference, West Lafayette, IN, Oct. 1990.

Electromagnetic Instabilities in an Inhomogeneous Plasma. A. B. Mikhailovskii. Institute of Physics, Philadelphia, PA, 1992 (distributor, American Institute of Physics, New York). xx, 298 pp., $110. Plasma Physics Series. Translated from the Russian by E. W. Laing.

Environmental Neurotoxicology. Committee on

Neurotoxicology and Models for Assessing Risk. National Academy Press, Washington, DC, 1992. xii, 154 pp., illus. Paper, $24.95.

Eocene-Oligocene Climatic and Biotic Evolution. Donald R. Prothero and William A. Berggren, Eds. Princeton University Press, Princeton, NJ, 1992. xiv, 568 pp., illus. $99.50; paper, $49.95. Princeton Series in Geology and Paleontology.

Epidemics and Ideas. Essays on the Historical Perception of Pestilence. Terence Ranger and Paul Slack, Eds. Cambridge University Press, New York, 1992. x, 346 pp., $49.95. Past and Present Publications. From a conference, Oxford, Sept. 1989.

Ethnobiological Classification. Principles of Categorization of Plants and Animals in Traditional Societies. Brent Berlin. Princeton University Press, Princeton, NJ, 1992. xviii, 335 pp., illus. $45.

The Fullness of Space. Nebulae, Stardust, and the Interstellar Medium. Gareth Wynn-Williams. Cambridge University Press, New York, 1992. xvi, 202 pp., illus. $65; paper, $29.95.

Fundamentals of Dynamical Systems and Bifurcation Theory. Milan Medved'. Ister Science Press, Bratislava, Czechoslovakia, and Hilger, Philadelphia, 1992 (distributor, American Institute of Physics, New York). viii, 293 pp., illus. $66.

Fundamentals of Plant Virology. R. E. F. Matthews. Academic Press, San Diego, CA, 1992. xii, 403 pp., illus. $59.95.

Grasslands and Grassland Sciences in Northern China. A Report of the Committee on Scholarly Communication with the People's Republic of China. National Academy Press, Washington, DC, 1992. xvi, 214 pp., illus. Paper, $31.

Greenhouse Earth. Annika Nilsson. Published on behalf of the Scientific Committee on Problems of the Environment by Wiley, New York, 1992. xvi, 219 pp., illus. Paper, $21.50.

Ground Water Handbook. 2nd ed. Government Institutes, Rockville, MD, 1992. xiv, 141 pp., illus. Paper, $69. Reprint of material published in 1990 and 1991 by the U.S. Environmental Protection Agency Office of Research and Development.

Growth Regulation by Nuclear Hormone Receptors. M. G. Parker, Ed. Cold Spring Harbor Laboratory Press, Cold Spring Harbor, NY, 1992. viii, 244 pp., illus. $66. Cancer Surveys, vol. 14.

Guarding the Guardians. Civilian Control of Nuclear Weapons in the United States. Paul Douglas Feaver. Cornell University Press, Ithaca, NY, 1992. xviii, 262 pp. $34.50. Cornell Studies in Security Affairs.

Handbook of Integration. Daniel Zwillinger. Jones and Bartlett, Boston, 1992. xvi, 367 pp., illus. $49.95. Jones and Bartlett Books in Mathematics.

Handbook of Mass Spectra of Environmental Contaminants. Ronald A. Hites. 2nd ed. Lewis, Chelsea, MI, 1992. viii, 581 pp., illus. $69.95.

Hawaiian Insects and Their Kin. Francis G. Howarth and William P. Mull. University of Hawaii Press, Honolulu, 1992. 160 pp., illus. $19.95.

The Henry Holt Handbook of Current Science and Technology. A Sourcebook of Facts and Analysis Covering the Most Important Events in Science and Technology. Bryan Bunch. Holt, New York, 1992. xiv, 689 pp., illus. $50.

Herbivores. Their Interactions with Secondary Plant Metabolites. Vol. 2, Ecological and Evolutionary Processes. Gerald A. Rosenthal and May R. Berenbaum, Eds. 2nd ed. Academic Press, San Diego, CA, 1992. xii, 493 pp., illus. $99.

Indoor Air Pollution. Problems and Priorities. G. B. Leslie and F. W. Lunau. Cambridge University Press, New York, 1992. xii, 330 pp., illus. $79.95.

The Inevitable Bond. Examining Scientist-Animal Interactions. Hank Davis and Dianne Balfour, Eds. Cambridge University Press, New York, 1992. xii, 399 pp., illus. $75.

Infrared (2.1–25 μm) Spectra of Minerals. John W. Salisbury *et al.* Johns Hopkins University Press, Baltimore, MD, 1992. xxviii, 267 pp., illus., + diskette. $75. Johns Hopkins Studies in Earth and Space Sciences.

Infrared Astronomy with ISO. Th. Encrenaz and M. F. Kessler, Eds. Nova, Commack, NY, 1992. xxviii, 547 pp., illus. $132. Les Houches Series. From a workshop, Les Houches, France, June 1991.

Inhibition. History and Meaning in the Sciences of Mind and Brain. Roger Smith. University of California Press, Berkeley, 1992. xii, 333 pp., $45.

Innovations in Antiviral Development and the Detection of Virus Infections. Timothy M. Block *et al.*, Eds. Plenum, New York, 1992. xviii, 218 pp., illus. $69.50. Advances in Experimental Medicine and Biology. From a symposium, Philadelphia, PA, Nov. 1990.

Inorganic Polymeric Glasses. R. C. Ropp. Elsevier, New York, 1992. xiv, 321 pp., illus. $208.50. Studies in Inorganic Chemistry, 15.

Mechanisms of Eukaryotic DNA Recombination. Max E. Gottesman and Henry J. Vogel, Eds. Academic Press, San Diego, CA, 1992. xii, 215 pp., illus. $55.

Men and Women of Space. Douglas B. Hawthorne. Univelt, San Diego, CA, 1992. xiv, 904 pp., illus. $90.

Mendelian Inheritance in Man. Catalogs of Autosomal Dominant, Autosomal Recessive, and X-Linked Phenotypes. Victor A. McKusick with the assistance of Clair A. Francomano and Stylianos E. Antonarakis. 10th ed. Johns Hopkins University Press, Baltimore, MD, 1992. 2 vols. ccxxxvi, 2320 pp., illus. $150.

Metal Compounds in Environment and Life, 4. Interrelation Between Chemistry and Biology: In Memoriam of Hans Wolfgang Nurnberg. Ernest Merian and Werner Haerdi, Eds. Science and Technology Letters, Middlesex, U.K., and Science Reviews, Wilmington, DE, 1992. xii, 514 pp., illus. $130. From a workshop, Les Disblerets, Switzerland, March 1991.

Methods in Computational Chemistry. Vol. 4, Molecular Vibrations. Stephen Wilson, Ed. Plenum, New York, 1992. xiv, 239 pp., illus. $69.50.

Neural Prostheses. Replacing Motor Function After Disease or Disability. Richard B. Stein, P. Hunter Peckham, and Dejan B. Popovic, Eds. Oxford University Press, New York, 1992. xii, 345 pp., illus. $65.

Nonsmooth Optimization. Analysis and Algorithms with Applications to Optimal Control. Marko M. Mäkelä and Pekka Neittaanmäki. World Scientific, River Edge, NJ, 1992. xii, 254 pp., illus. $38.

Nuclear Weapons in the Changing World. Perspectives from Europe, Asia, and North America. Patrick J. Garrity and Steven A. Maaranen, Eds. Plenum, New York, 1992. xxiv, 278 pp. $30. Issues in International Security.

Numbers and Functions. Steps into Analysis. R. P. Burn. Cambridge University Press, New York, 1992. xxii, 328 pp., illus. $69.95.

Nutrient Enhanced Coastal Ocean Productivity. Texas A&M University Sea Grant Program, Galveston, and National Oceanic and Atmospheric Administration, Washington, DC, 1992. iv, 153 pp., illus. Paper. From a workshop, Oct. 1991.

Nutritional Biochemistry of the Vitamins. David A. Bender. Cambridge University Press, New York, 1992. xx, 431 pp., illus. $89.95.

Phase Transitions in Liquid Crystals. S. Martellucci and A. N. Chester, Eds. Plenum, New York, 1992. x, 505 pp., illus. $125. NATO Advanced Science Institutes Series B, vol. 290. From an institute, Erice, Italy, May 1991.

Phenolic Metabolism in Plants. Helen A. Stafford and Ragai K. Ibrahim, Eds. Plenum, New York, 1992. xiv, 411 pp., illus. $89.50. Recent Advances in Phytochemistry, vol. 26. From a meeting, Fort Collins, CO, June 1991.

Proceedings of the 1st Experimental Chaos Conference. (Arlington, VA, October 1991.) Sandeep Vohra *et al.*, Eds. World Scientific, River Edge, NJ, 1992. xiv, 416 pp., illus. $68; paper, $42.

Proceedings of the Second International Symposium on Solid State Physics-II. (Kandy, Sri Lanka, May 1989.) M. A. K. L. Dissanayake, K. Tennakone, and O. A. Ileperuma, Eds. Nova, Commack, NY, 1992. xii, 320 pp., illus. $87.

Progress in Particle and Nuclear Physics. Vol. 28, 4π-High-Resolution Gamma-Ray Spectroscopy. Amand Faessler, Ed. Pergamon, Oxford, U.K., 1992. x, 531 pp., illus. £155. From a school, Erice, Italy, Sept. 1991.

Promoting Health and Preventing Disease. Donald J. Scherl, Jay Noren, and Marian Osterweis, Eds. Academic Health Centers, Washington, DC, 1992. xiv, 212 pp. Paper, $20. Health Policy Annual, 2.

Protein Interactions. Gregorio Weber. Routledge, Chapman and Hall, New York, 1992. x, 293 pp., illus. $55.

The Rediscovery of the Mind. John R. Searle. MIT Press, Cambridge, MA, 1992. xvi, 270 pp. $22.50. Representation and Mind.

Regular and Chaotic Dynamics. A. J. Lichtenberg and M. A. Lieberman. 2nd ed. Springer-Verlag, New York, 1992. xxii, 693 pp., illus. $59.95. Applied Mathematical Sciences, 38.

Remote Sensing by Fourier Transform Spectrometry. Reinhard Beer. Wiley, New York, 1992. xx, 153 pp., illus. $74.95. Chemical Analysis, vol. 120.

Representations in Archaeology. Jean-Claude Gardin and Christopher S. Peebles, Eds. Indiana University Press, Bloomington, 1992. xiv, 395 pp., illus. $70; paper, $29.95. From an institute, Bloomington, IN, 1983.

Representations of Algebras and Related Topics. H. Tachikawa and S. Brenner, Eds. Cambridge University Press, New York, 1992. x, 291 pp., illus. Paper, $49.95. London Mathematical Society Lecture Note Series, 168. From a workshop, Tsukuba, Japan, 1990.

Science as Salvation. A Modern Myth and Its Meaning. Mary Midgley. Routledge, Chapman and Hall, New York, 1992. x, 239 pp., $25.

The Science of Crystallization. Macroscopic Phenomena and Defect Generation. William A. Tiller. Cambridge University Press, New York, 1992. xxxii, 484 pp., illus. $89.95; paper, $37.95.

Science, Religion, and Mormon Cosmology. Erich Robert Paul. University of Illinois Press, Urbana, 1992. xii, 273 pp. + plates. $29.95.

Semantic Networks in Artificial Intelligence. Fritz Lehmann and Ervin Y. Rodin, Eds. Pergamon, Oxford, U.K., 1992. x, 758 pp., illus. 69. International Series in Modern Applied Mathematics and Computer Science, vol. 24.

Sensing and Controlling Motion. Vestibular and Sensorimotor Function. Bernard Cohen, David L. Tomko, and Fred Guedry, Eds. New York Academy of Sciences, New York, 1992. xiv, 989 pp., illus. $190. Annals of the New York Academy of Sciences, vol. 656. From a conference, Palo Alto, CA, July 1991.

Space, Time and Man. A Prehistorian's View. Grahame Clark. Cambridge University Press, New York, 1992. ix, 165 pp., illus. $39.95.

Theory of Nonstationary Quantum Oscillators. M. A. Markov, Ed. Nova, Commack, NY, 1992. x, 168 pp., illus. $89. Proceedings of the Lebedev Physics Institute, vol. 198. Translated from the Russian by Christine A. Gallant.

Theory of Single and Multiple Interfaces. The Method of Surface Green Function Matching. Federico Garcia-Moliner and Victor R. Velasco. World Scientific, River Edge, NJ, 1992. xii, 498 pp., illus. $68.

Thermodynamics. History and Philosophy. Facts, Trends, Debates. K. Martinás, L. Ropolyi, and P. Szegedi, Eds. World Scientific, River Edge, NJ, 1991. xii, 529 pp., illus. $97. From a conference, Veszprem, Hungary, July 1990.

Thin Film Resistive Sensors. P. Ciureanu and S. Middelhoek, Eds. Institute of Physics, Philadelphia, PA, 1992 (distributor, American Institute of Physics, New York). x, 495 pp., illus. $175. Sensors Series.

Thomas Say. New World Naturalist. Patricia Tyson Stroud. University of Pennsylvania Press, Philadelphia, 1992. xvi, 341 pp., illus. $24.95.

Tropical Deforestation and Species Extinction. T. C. Whitmore and J. A. Sayer, Eds. Chapman and Hall, New York, NY, 1992. xx, 153 pp., illus. Paper, $29.95. From a workshop, Perth, Australia, Nov. 1990.

The Turing Option. Harry Harrison and Marvin Minsky. Warner, New York, 1992. 430 pp. $21.95. A novel.

Work and Family. Policies for a Changing Work Force. Marianne A. Ferber and Brigid O'Farrell, Eds. National Academy Press, Washington, DC, 1991. xii, 260 pp., $29.95. Committee on Women's Employment and Related Social Issues.

World Resources 1992–93. A Report by the World Resources Institute in Collaboration with the United Nations Environment Programme and the United Nations Development Programme. Oxford University Press, New York, 1992. xiv, 385 pp., illus. Paper, $19.95. Accompanied by a Teacher's Guide.