

discuss. Occasionally, however, I wished he had discussed the alternatives he eliminates as unlikely; he does not treat the evolution of an atmosphere on a cooling earth surface, for example, although that possibility has attracted a number of other workers.

One of the most valuable parts of the book is a bibliography of more than 500 items. I cannot vouch for the meteorology, but the coverage of the pertinent geological literature is excellent. The book shows little concern with historical development of ideas; more than 90 percent of the references are post-1960. There are references as recent as 1977, but full coverage essentially ceases at the end of 1973.

I find it a little odd that Walker has not made and "operated" quantitative models; his numerical discussions of feedbacks in various systems make it clear that he has come to the verge of mathematical modeling of entire systems. Walker has done a great service in providing a book that expresses current knowledge of the subject well and one that surely heralds the development of quantitative modeling.

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## Cancer Biology

**Cancer Invasion and Metastasis.** Biologic Mechanisms and Therapy. Papers from a workshop, New York, Dec. 1976. STACEY B. DAY, W. P. LAIRD MYERS, PHILIP STANSLY, SILVIO GARATTINI, and MARTIN G. LEWIS, Eds. Raven, New York, 1977. xxii, 518 pp., illus. \$35. Progress in Cancer Research and Therapy, vol. 5.

The tumor that may kill differs from the lump that is merely inconvenient or unsightly in one of two ways. Trouble is at hand when the tumor mass breaks through nearby basement membrane or when bits of it get into the circulation, successfully seed a distant tissue, and begin their own autonomous growth. The first trouble is called invasion, the second metastasis. Tumors that can do one or the other are fittingly called "malignant": they are bad news.

The baseline for studying either invasion or metastasis is an animal bearing, or about to grow, a malignant tumor. Such animals do not provide the easiest or the best-defined systems for biochemical or genetic analysis of either malignant process. But we try our best. This book, the record of a meeting at the

Sloan-Kettering Hospital, summarizes work on the subject quite well. In most cases the news is not good. Because scientists studying metastasis are dealing with a second-order (albeit lethal) event, they have no normal controls, only differences among already cancerous cell populations. Still it comes as a surprise to learn from these clinical and whole-animal studies that among the agents that increase metastasis in an animal (or a person) with a bad tumor are x-rays at the primary tumor site, glucocorticoids, and general anesthetics. That is, because of our ignorance of basic mechanisms, the triumvirate of therapies we use for the initial tumor (radiotherapy, chemotherapy, and surgery) may well be sowing iatrogenic metastases. Clearly, basic mechanisms must be intensively studied if we are ever to follow Hippocrates and "do no harm" while treating cancer.

This book contains almost three dozen laboratory review articles on the specific mechanisms and current therapies of malignancy. Metastasis seems to be a hotter subject than invasion. To a cell biologist the papers on the mechanisms of metastasis make much more interesting reading than the ones on its therapy. Certainly they are less depressing. Cell characteristics claimed to have predictive value in determining high metastatic potential include adhesion (Nicolson), aggregability (Poste), clumping (Good), platelet aggregation (Warren, Chauvin, and Philips), inability to be recognized by macrophages (Alexander), production of inappropriate surface antigen (Levine), release of angiogenic capillary-proliferative factors (Folkman and Tyler), and production of proteases (Kleinerman and Liotta) and protease activators (Weinstein). Last but not least, the exhaustive studies of Fidler, Gersten, and Riggs show that specific metastatic ability may be inherited by the tumor cells and that its biochemistry may therefore be studied in matched pairs of clones differing only in metastatic efficiency or target specificity.

These markers are not so exotic as one might have thought. Indeed, they read like a short list of key words in a National Cancer Institute research grant application. Why then are so few laboratories applying to metastasis the incisive biochemistry now lavished on the tumor viruses? Perhaps this book will help a few smart people get up the nerve to get their gels a bit dirty. One quibble: the book lacks an author index.

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## Books Received

**Annual Review of Entomology.** Vol. 23. Thomas E. Mittler, Carroll N. Smith, and Vincent H. Resh, Eds. Annual Reviews, Palo Alto, Calif., 1978. xii, 524 pp., illus. \$17.

**Annual Review of Fluid Mechanics.** Vol. 10. Milton van Dyke, J. V. Wehausen, and John L. Lumley, Eds. Annual Reviews, Palo Alto, Calif., 1978. xii, 476 pp., illus. \$17.

**Appropriate Technology.** Problems and Promises. Nicolas Jéquier, Ed. Organisation for Economic Co-operation and Development, Paris, 1976 (U.S. distributor, OECD Publications Center, Washington, D.C.). 346 pp. Paper, \$12.50. Development Centre Studies.

**Atherosclerosis.** Metabolic, Morphologic, and Clinical Aspects. Proceedings of a conference, London, Ontario, Canada, Sept. 1975. George W. Manning and M. Daria Haust, Eds. Plenum, New York, 1977. xxxviii, 1018 pp., illus. \$75. Advances in Experimental Medicine and Biology, vol. 82.

**Biology of Developing Systems.** Philip Grant. Holt, Rinehart and Winston, New York, 1977. xvi, 720 pp., illus. \$18.95.

**British Electro-optics.** Proceedings of a conference, Tokyo, Dec. 1975. L. R. Baker, Ed. Taylor and Francis, London, 1977 (U.S. distributor, Crane, Russak, New York). viii, 142 pp., illus. \$21.50.

**Cancer Metastasis.** Approaches to the Mechanism, Prevention, and Treatment. Papers from a conference, Kona, Hawaii, May 1976. Philip G. Stansly and Haruo Sato, Eds. University Park Press, Baltimore, 1977. viii, 248 pp., illus. \$44.50.

**Carotenoproteins in Animal Coloration.** Welton L. Lee, Ed. Dowden, Hutchinson and Ross, Stroudsburg, Pa., 1977 (distributor, Academic Press, New York). xvi, 396 pp., illus. \$30. Benchmark Papers in Biological Concepts, vol. 3.

**Cauldron of Hell: Tunguska.** Jack Stoneley. A. T. Lawton, Scientific Editor. Simon and Schuster, New York, 1977. 216 pp. + plates. \$8.95.

**Chemical Analysis of Organometallic Compounds.** Vol. 5, Elements of Groups VIA, VIB, VIIA, VIIB, Aluminium and Zinc. T. R. Crompton. Academic Press, New York, 1977. xii, 432 pp., illus. \$46.90. The Analysis of Organic Materials, 4.

**Introduction to Group Theory with Applications.** Gerald Burns. Academic Press, New York, 1977. xvi, 430 pp., illus. \$18.50. Materials Science and Technology.

**Introductory Statistics.** Roger E. Kirk. Brooks/Cole, Monterey, Calif., 1978. x, 438 pp., illus. \$14.95.

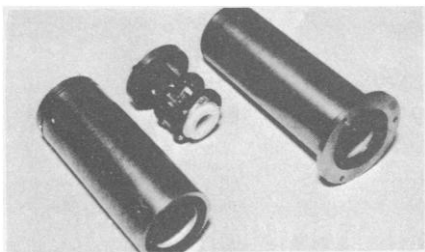
**Inversion Methods in Atmospheric Remote Sounding.** Proceedings of a workshop, Williamsburg, Va., Dec. 1976. Adarsh Deepak, Ed. Academic Press, New York, 1977. xvi, 622 pp., illus. \$28.

**Kinship and Marriage in Burma.** A Cultural and Psychodynamic Analysis. Melford E. Spiro. University of California Press, Berkeley, 1977. xx, 314 pp. \$15.

**Let's Learn about Aging.** A Book of Readings. John R. Barry and C. Ray Wingrove, Eds. Schenkman, Cambridge, Mass., and Halsted (Wiley), New York, 1977. xvi, 528 pp., illus. \$18.50.

**Lightning.** R. H. Golde, Ed. Academic Press, New York, 1977. Two volumes. Vol. 1, Physics of Lightning. xx, 496 pp., illus. + index. \$41. Vol. 2, Lightning Protection. xx + pp. 497-850, illus. + index. \$33.25.

(Continued on page 284)

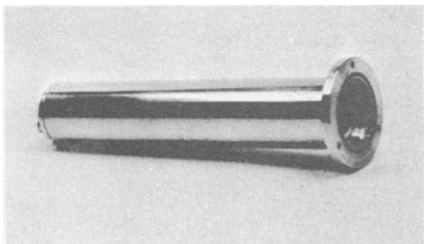


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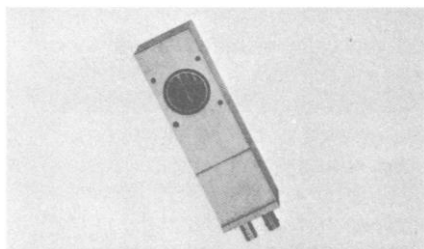
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## BOOKS RECEIVED

(Continued from page 248)

**Methods in Immunology.** A Laboratory Text for Instruction and Research. Justine S. Garvey, Natalie E. Cremer, and Dieter H. Sussdorf. Benjamin Advanced Book Program, Reading, Mass., ed. 3, 1977. xxvi, 546 pp., illus. \$27.50.

**The Mineralogy of the Diamond.** Yu. L. Orlov. Translated from the Russian edition (Moscow, 1973). Wiley-Interscience, New York, 1977. xii, 236 pp., illus. \$28.50.

**Mutual Accommodation.** Ethnic Conflict and Cooperation. Robin M. Williams, Jr., in collaboration with Madelyn B. Rhenisch. University of Minnesota Press, Minneapolis, 1977. xviii, 458 pp. \$15.

**The New Model Rocketry Manual.** G. Harry Stine. Arco, New York, 1977. 124 pp., illus. Cloth, \$6.95; paper, \$3.25.

**NMR in Biology.** Papers from a meeting, Oxford, England, Mar. 1977. R. A. Dwek, I. D. Campbell, R. E. Richards, and R. J. P. Williams, Eds. Academic Press, New York, 1977. xvi, 382 pp., illus. \$17.65.

**Nutrition and Cancer.** Myron Winick, Ed. Wiley-Interscience, New York, 1977. viii, 184 pp. \$18. Current Concepts in Nutrition, vol. 6.

**The Observer's Handbook 1978.** John R. Percy, Ed. Royal Astronomical Society of Canada, Toronto, 1977. 128 pp., illus. Paper, \$4.

**Personality and Adjustment in the Aged.** R. D. Savage, L. B. Gaber, P. G. Britton, N. Bolton, and A. Cooper. Academic Press, New York, 1977. x, 188 pp. \$16.

**Perspectives in the Sociology of Science.** Stuart S. Blume, Ed. Wiley, New York, 1977. viii, 238 pp. \$24.50.

**Photochemical and Photobiological Reviews.** Vol. 2. Kendrick C. Smith, Ed. Plenum, New York, 1977. x, 330 pp., illus. \$29.50.

**The Physics of Semi-Conductor Devices.** D. A. Fraser. Clarendon (Oxford University Press), New York, 1977. x, 150 pp., illus. \$13.50. Oxford Physics Series.

**Politics of Pain Management.** Staff-Patient Interaction. Shizuko Y. Fagerhaugh and Anselm Strauss. Addison-Wesley Health Sciences Division, Menlo Park, Calif., 1977. xii, 324 pp. Paper, \$8.95.

**Power Sources 6.** Research and Development in Non-Mechanical Electrical Power Sources. Proceedings of a symposium, Brighton, England, Sept. 1976. D. H. Collins, Ed. Academic Press, New York, 1977. xii, 796 pp., illus. \$70.25.

**Proceedings of the Eighth International Congress of the International Union for the Study of Social Insects.** Wageningen, The Netherlands, Sept. 1977. J. de Wilde, Ed. Centre for Agricultural Publishing and Documentation, Wageningen, The Netherlands, 1977. xii, 326 pp., illus. Paper, Dfl. 40.

**Progress in Allergy.** Vol. 23. Paul Kallós, Byron H. Waksman, and Alain L. de Weck, Eds. Karger, Basel, 1977. xiv, 366 pp., illus. \$71.50.

**Psychological Testing.** The Measurement of Intelligence, Ability and Personality, Paul Kline. Crane, Russak, New York, 1977. 168 pp. \$11.50.

**Psychophysics and Physiology of Hearing.** Proceedings of a symposium, Keele, Staffordshire, England, Apr. 1977. E. F. Evans and J. P. Wilson, Eds. Academic Press, New York, 1977. xx, 526 pp., illus. \$27.35.

**Public Economics and the Quality of Life.**

Papers from a conference, New Orleans, Jan. 1975. Lowdon Wingo and Alan Evans, Eds. Published for Resources for the Future and the Centre for Environmental Studies by Johns Hopkins University Press, Baltimore, 1978. xvi, 328 pp., illus. \$17.95.

**Respiratory Defense Mechanisms.** Part 2. Joseph D. Brain, Donald F. Proctor, and Lynne M. Reid, Eds. Dekker, New York, 1977. xx + pp. 487-1216, illus. \$69.50. Lung Biology in Health and Disease, vol. 5.

**Salt-Water Purification.** K. S. Spiegler, Plenum, New York, ed. 2, 1977. x, 190 pp., illus. \$19.50.

**Science and Building.** Structural and Environmental Design in the Nineteenth and Twentieth Centuries. Henry J. Cowan. Wiley-Interscience, New York, 1978. x, 374 pp., illus. \$23.

**Science Based on Symmetry.** Vol. 1. K. R. Chakravorty. Firma KLM (P) Limited, Calcutta, 1977. i, 502 pp., illus. Rs. 150.

**Seismic Sea Waves—Tsunamis.** T. S. Murty. Department of Fisheries and the Environment, Ottawa, Canada, 1977 (available from Printing and Publishing Supply and Services Canada, Ottawa). x, 338 pp., illus. \$12. Bulletin of the Fisheries Research Board of Canada, 198.

**Sentics.** The Touch of Emotions. Manfred Clynes. Anchor/Doubleday, New York, 1978. xxxiv, 250 pp., illus. + plates. Paper, \$3.95. Reprint of the 1977 edition.

**Sexual Stratification.** A Cross-Cultural View. Alice Schlegel, Ed. Columbia University Press, New York, 1977. xx, 372 pp. Cloth, \$20; paper, \$7.50.

**Studies in Convection.** Vol. 2. Theory, Measurement and Applications. B. E. Launder, Ed. Academic Press, New York, 1977. viii, 224 pp., illus. \$17.25.

**System Theory.** Philosophical and Methodological Problems. I. V. Blauberg, V. N. Sadosky, and E. G. Yudin. Translated from the Russian. Progress Publishers, Moscow, 1977 (U.S. distributor, Imported Publications, Chicago). 318 pp. \$4.

**Technology and Social Shock.** Edward W. Lawless. Rutgers University Press, New Brunswick, N.J., 1977. xii, 616 pp. Paper, \$6.95.

**Topics in Interstellar Matter.** Papers from a meeting, Grenoble, Aug. 1976. Hugo van Woerden, Ed. Reidel, Boston, 1977. viii, 300 pp., illus. \$30. Astrophysics and Space Science Library, vol. 70.

**Trace Fossils 2.** Proceedings of a symposium, Sydney, Australia, Aug. 1976. T. P. Crimes and J. C. Harper, Eds. Seel House Press, Liverpool, England, 1977. viii, 352 pp., illus. \$39. *Geological Journal* Special Issue No. 9.

**Two-Phase Flow and Heat Transfer.** D. Butterworth and G. F. Hewitt, Eds. Oxford University Press, New York, 1977. xxvi, 514 pp., illus. \$32. Harwell Series.

**Verhandlungen der Gesellschaft für Ökologie, Göttingen 1976.** Papers from a meeting, Göttingen, Germany, Sept. 1976. P. Müller, Ed. Junk, The Hague, 1977. xvi, 622 pp., illus. Paper, Dfl. 100.

**Welding Process Technology.** P. T. Houldcroft. Cambridge University Press, New York, 1977. x, 314 pp., illus. \$17.95.

**World Prehistory in New Perspective.** Grahame Clark. Cambridge University Press, New York, ed. 3, 1977. xx, 554 pp., illus. Cloth, \$29.95; paper, \$9.95.

**The Year of the Dinosaur.** Edwin H. Colbert. Illustrated by Margaret Colbert. Scribner, New York, 1978. xvi, 172 pp. \$9.95.