thought to be helpful during labor or how an anatomist views the possibility that it might have been a white shark, rather than a whale, that swallowed Jonah. And there are interesting digressions into the hydrodynamic explanation of the "dead water" phenomenon to dispel the ancient myth that remoras can suddenly stop a ship. The serious reader will appreciate the readable accounts of the classification, anatomy, and physiology of sharks. Many aspects of the behavior of sharks and the function of such special organs as the ampullae of Lorenzini are controversial and complex. Budker does not oversimplify the varying results of experiments and observations by scientists and divers but builds up to the final solution or remaining unsolved problem in a detective-story manner, bringing in his personal experiences and the observations of others in an intriguing, if sometimes verbose, account of the problems in shark biology. He criticizes, with expertise and with gentlemanly reserve, his colleagues' explanations for the caudal keels on some sharks, the long tail of the thresher, the peculiar shape of the hammerhead, the role of the cupula in connection with function of the pit organs, and swimming speed. On the whole Budker has done a remarkable job of presenting the array of evidence concerning the ways sharks are built and behave.

The book does not cover some recent research results (for example, the shark is less of a "swimming nose" than supposed since there is evidence that the huge "olfactory" lobes of the brain have functions other than olfaction) and the chapter on remoras is weakened by omission of the mounting evidence that the remora acts as a cleaner fish for sharks. The book also perpetuates a mystique about sharks by implying that, unlike other animals, sharks are unpredictable. If this were true the Cousteau, Dewey Bergman, and Peter Gimble teams would be out of business. In summing up sharks' uses to man, Budker paraphrases a saying that practically "everything about a shark is of use except the snap of its jaws and the lash of its tail." However, the popular full-length movie now showing in local cinemas, "Blue Water, White Death," indicates that man has learned to capitalize even on these aspects.

In the early 1950's, after the synthesis of vitamin A and the increase in the cost of hand labor, the shark industry collapsed. Liver oil, hide, fins, and flesh were no longer in demand or too costly to supply. At present, sharks are hunted as movie stars, but as this industry passes its vogue, let us hope that sharks will still be valued as contributing to our understanding of many biological phenomena including the present structure and past history of the human body. If any one book can show the value of sharks as subjects for man's use and study, this one does, in simple and readable terms.

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Atmospheric Science

Precipitation Scavenging (1970). Proceedings of a symposium, Richland, Wash., June 1970. U.S. Atomic Energy Commission, Oak Ridge, Tenn., 1970 (available as CONF-700601 from the National Technical Information Service, Springfield, Va.). xii, 498 pp., illus. Paper, $6. AEC Symposium Series, vol. 22.

In this symposium the concern of the Atomic Energy Commission extends beyond the study of what is removed from the atmosphere to the important questions of why and how aerosols and gases are removed. Various contributions to the symposium discuss the removal of radioactive and nonradioactive, chemically active and inert materials.

The proceedings volume is divided into five parts: Field Experiments, Laboratory Experiments and Techniques, Scavenging of Gases, Microphysics in Scavenging, and Models and Predictions. Each part contains a number of papers which either review a particular phase of research related to removal of material by precipitation or describe the results of experiments performed in this field.

In the section Microphysics in Scavenging, Hidy, Slinn and Hales, and other authors discuss various processes that affect the removal of aerosol particles and gases; the lack of agreement on some points is invigorating. The section includes a review of the theory of diffusive and impactive scavenging which covers the entire chain of microprocesses: attachment of trace substances onto aerosol particles, collision of those particles with liquid or solid aerosol particles (cloud droplets or ice crystals), transfer processes during water vapor condensation, and temporal changes in the size distribution of liquid cloud droplets.

Field and laboratory experiments, which provide numerical results applicable to models and predictions, constitute—as is appropriate—the largest section of the proceedings. Of particular interest are studies performed with cosmogenic radionuclides ^{38}Cl, ^{39}Cl, and ^{24}Na (Perkins *et al.*), which supply information on the rates and mechanisms of in-cloud removal of tagged natural aerosol particles. The hypothesis that submicron particles are scavenged by neutral and electrostatically charged water drops is advanced; the effect of the solubilities of gases on their removal by raindrops is discussed; and the removal of SO_2, NO_2, CO_2, and halogens is treated in great detail. Models are presented which successfully predict the removal of radioactive species from the troposphere and the transfer of radioactive materials from the stratosphere into the troposphere.

The volume should attract a rather wide audience. It will serve meteorologists interested in processes taking place within clouds and should be of interest to those engaged in air pollution studies. It will serve physical chemists, physicists, and chemists as well. The reader will have ample opportunity to disagree with some of the statements made and to form his own opinions of how gas molecules, aerosol particles, cloud droplets, and ice crystals interact. The collection of articles is also a convenient point of entry into one of the most complex of fields, that of cloud chemistry and physics. The proceedings show both how little we know about processes involving water in our atmosphere and how rapidly we are progressing in this field.

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Books Received

Applied Statistics in Decision-Making. George K. Ckacko. Elsevier, New York, 1971. xvi, 494 pp., illus. $15.

Architectural Structures. An Introduction to Structural Mechanics. Henry J. Cowan. Elsevier, New York, 1971. xii, 400 pp., illus. $15.75.

Aspects of Manpower Planning. D. J. Bartholomew and B. R. Morris, Eds. Elsevier, New York, 1971. xii, 130 pp., illus. $7.50.

Atlas of Neuropathology. Sumner I. Zacks. Harper and Row, New York, 1971. xvi, 394 pp., illus. $18.

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BOOKS RECEIVED

(*Continued from page 137*)

Behavior Modification in Child Treatment. An Experimental and Clinical Approach. Robert M. Browning and Donald O. Stover. Aldine-Atherton, Chicago, 1971. viii, 422 pp., illus. $11.95.

The Corporate Economy. Growth, Competition, and Innovative Potential. Robin Marris and Adrian Wood, Eds. Harvard University Press, Cambridge, Mass., 1971. xxvi, 554 pp. $15. Harvard Studies in Technology and Society.

Crop Production. Cereals and Legumes. Brian F. Bland. Academic Press, New York, 1971. xii, 466 pp., illus. $14.50.

Data Processing and Computer Programming. A Modular Approach. Thomas J. Cashman and William J. Keys. Canfield, San Francisco, 1971. xiv, 498 pp., illus. $10.95.

Exploring the Universe. American Foundation for Continuing Education. Louise B. Young, Ed. Oxford University Press, New York, ed. 2, 1971. xiv, 732 pp., illus. Cloth, $12.50; paper, $6.50.

Fluid Flow. A First Course in Fluid Mechanics. Rolf H. Sabersky, Allan J. Acosta, and Edward G. Hauptmann. Macmillan, New York, ed. 2, 1971. xx, 520 pp., illus. $12.95.

The Fourth State of Matter. Plasma Dynamics and Tomorrow's Technology. Ben Bova. Saint Martin, New York, 1971. x, 182 pp., illus. $5.95.

Immunobiology. Current Knowledge of Basic Concepts in Immunology and Their Clinical Applications. Robert A. Good and David W. Fisher, Eds. Sinauer, Stamford, Conn., 1971. xii, 306 pp., illus. $10.95.

Kinetic Equations. Richard L. Liboff and Norman Rostoker, Eds. Gordon and Breach, New York, 1971. xvi, 346 pp., illus. $19.50.

Laminar Wakes. Stanley A. Berger. Elsevier, New York, 1971. xxii, 296 pp., illus. $16.

Leaders of American Conservation. Henry Clepper, Ed. Ronald Press, New York, 1971. x, 354 pp. $10.

Litton's Problematical Recreations. James F. Hurley, Ed. Van Nostrand Reinhold, New York, 1971. viii, 338 pp., illus. $7.95.

Management, Innovation, and System Design. Ira G. and Marthann E. Wilson. Auerbach, Princeton, N.J., 1971. xiv, 176 pp., $7.95.

Mathematical Methods in Nuclear Reactor Dynamics. Ziya Akcasu, Gerald S. Lellouche, and Louis M. Shotkin. Academic Press, New York, 1971. xii, 460 pp., illus. $22. Nuclear Science and Technology, vol. 7.

Mathematics. Concrete Behavorial Foundations. Joseph M. Scandura, with the assistance of John Durnin and George Lowerre. Harper and Row, New York, 1971. xx, 460 pp., illus. $11.95.

Mechanical Performance and Design in Polymers. Applied Polymer Symposium No. 17, Melbourne, Australia, May 1970. Oskar Delatycki, Ed. Wiley-Interscience, New York, 1971. vi, 246 pp., illus. Paper, $12.

Methods in Enzymology. Vol. 22, Enzyme Purification and Related Techniques. William B. Jakoby, Ed. Academic Press, New York, 1971. xvi, 648 pp., illus. $29.50.

Migration and Anthropology. Proceedings of a meeting, Ottawa, May 1970. Robert F. Spencer, Ed. American Ethnological Society, Smithsonian Institution, Washington, D.C., 1971 (distributed by University of Washington Press, Seattle). vi, 190 pp. Paper, $5.

Modern Aspects of Electrochemistry. No. 6. J. O'M. Bockris and B. E. Conway, Eds. Plenum, New York, 1971. xiv, 382 pp., illus. $19.50.

Modern Theory of Polymer Solutions. Hiromi Yamakawa. Harper and Row, New York, 1971. xvi, 420 pp., illus. $19.95.

The Modified Nucleosides in Nucleic Acids. Ross H. Hall. Columbia University Press, New York, 1971. xvi, 452 pp., illus. $20.

Museums and the Environment. A Handbook for Education. Environmental Committee of the American Association of Museums, Washington, D.C., 1971. xviii, 262 pp., illus. $12.50.

Natural Selection in Human Populations. The Measurement of Ongoing Genetic Evolution in Contemporary Societies. Carl Jay Bajema, Ed. Wiley, New York, 1971. x, 406 pp., illus. Cloth, $9.95; paper, $4.95.

Neurotransmitter-Receptor Interactions. D. J. Triggle. Academic Press, New York, 1971. x, 610 pp., illus. $26.

The New Scientists. David Fishlock, Ed. Oxford University Press, New York, 1971. vi, 98 pp. Paper, $3. Science and Engineering Policy Series.

Old Age, the Last Segregation. Ralph Nader's Study Group Report on Nursing Homes. Claire Townsend. Grossman, New York, 1971. xx, 230 pp. $6.95.

Organized Complexity. Empirical Theories of Political Development. Ronald D. Brunner and Garry D. Brewer. Free Press, New York, 1971. xviii, 190 pp., illus. $7.

The Ovarian Cycle of Mammals. John S. Perry. Oliver and Boyd, Edinburgh, 1971. viii, 218 pp., illus. Cloth, $7.20; paper, $3.60. University Reviews in Biology.

Parasitic Insects. R. R. Askew. Elsevier, New York, 1971. xx, 316 pp., illus. $11.50.

Pathology of the Nervous System. Vol. 2. Jeff Minckler, Orville T. Bailey, Irwin Feigin, George Jervis, Richard Lindenberg, and Karl T. Neubuerger, Eds. McGraw-Hill, New York, 1971. xx + pp. 1267–2240, illus. + index. $65.

Petroleum Conservation in the United States. An Economic Analysis. Stephen L. McDonald. Published for Resources for the Future, Inc., by Johns Hopkins Press, Baltimore, Md., 1971. xvi, 280 pp., illus. $10.

Phase and Frequency Instabilities in Electromagnetic Wave Propagation. Proceedings of the 33rd Advisory Group for Aerospace Research and Development of NATO Conference, Leicester, England. Kenneth Davies, Ed. Technivision, Slough, England, 1971. 806 pp., illus.

Physical Biochemistry. Kensal Edward Van Holde. Prentice-Hall, Englewood Cliffs, N.J., 1971. x, 246 pp., illus. Cloth, $9.75; paper, $4. Foundations of Modern Biochemistry Series.