
This book is a collection of tutorials, technical reports, technique summaries, and bibliographies related to measurement instrumentation and analytical techniques employed in pollution monitoring in industrial environments. While the subject matter ranges from mathematics-laden theoretical discussion to historical overviews with associated lengthy reference lists, the work can hardly be considered a textbook. The book does provide a look at contemporary as well as classical tools and procedures and should be of interest to the industrial engineer or technician. To the editor's credit, the authors represented are a mix of academia and practicing scientists and engineers.

Chapter 1, by Terry Austin, reviews particle measurement techniques. Methods discussed include sedimentation, sieving, microscopy, Coulter Counter, photography, laser shadowgraphy, holography, light scattering, and hydrodynamic chromatography. Only brief mention is made of impactors and electric mobility analyzers, two currently popular devices. Although, admittedly, these instruments may be more relevant to research than basic industrial monitoring, they probably deserve better than just being placed in an "other methods" paragraph.

Studies in Atmospheric Particulate Characterization Techniques is the title of Chapter 2, by B. R. Appel. This chapter is a comprehensive review of aerosol sampling and analytical techniques as employed in field and laboratory studies conducted by the Air and Industrial Hygiene Laboratory of the California Department of Health Services. A fine presentation of filter media evaluation and artifact particulate formation is followed by discussion and evaluation of several laboratory analytical procedures ranging from simple extraction and turbidimetric methods to ion chromatography.

Frank Chung opens Chapter 3 by getting us off the hook and putting the blame where it rightfully belongs: "Prometheus stole fire from Olympus and brought it to mankind. He was rightly punished, not for his defiance of Zeus, but because the fire started air pollution." In this chapter, a compilation of pollutants found in airborne particulates is followed by an overview of several methods by which airborne particles are imaged/analyzed—microscopy, microprobe, spectroscopy, spectrometry, chromatography, and diffraction.

Chapter 4, by Gordon Lewandowski, discusses procedures and apparatus used for sampling gases and particulates in industrial stacks. Several good schematic diagrams illustrate classic sampling schemes and EPA (Environmental Protection Agency) methods, and some possible pitfalls are addressed. The coverage of continuous electronic monitors seems inadequate.

Bag sequential sampling is discussed in Chapter 5 by Jerry Bullin and John Polasek. Some interesting data are presented for sample deterioration in several bag materials as a function of time and for comparisons with continuous monitors.

Chapter 6, Pressure Drop Measurements Across Filters, by Kuo-chung Fan and James Gentry, is basically a bibliography on the subject—58 references in 10 pages of text. Membrane and fiber filters are discussed.

In a paper laden with reaction schemes and references, Hajime Akimoto discusses airborne gaseous photochemicals. Measurement devices such as smog chambers, spectrometry, and chromatograph systems are described, but the bulk of Chapter 8 is heavy reading in reaction theory, better understood by the research chemist than the plant engineer.

Chapter 9, by Arthur Greenberg and Rina Yokoyama, deals with the specialized class of polynuclear aromatic hydrocarbons. Collection and chromatography procedures are discussed.

Chapter 10, by Peter Freymuth and Leroy Fingerson, is a rigorous treatment of thermal anemometry, the measurement of fluid flow characteristics by means of thermal sensors. An interesting historical summary leads into the detailed physics of fluids and heat transfer and ultimately to practical implementation.

In Chapter 11, Peter Gooch describes a specialized class of fluidic flowmeters. Although interesting, this information seems more appropriate to a manufacturer's brochure.

Kenneth M. Busness is a Senior Development Engineer in the Atmospheric Sciences Department, Battelle—Pacific Northwest Laboratories, Richland, Wash.


This book contains the technical proceedings of the "Symposium on Clouds: Their Formation, Optical Properties and Effects" held in Williamsburg, Va., 13-14 May 1980. The symposium consisted of 11 invited review papers presented to a select audience of invited participants from universities, nonprofit institutions, research laboratories, and government agencies. The purpose of the symposium was to review the knowledge of clouds and their optical properties and to assess the nature and scope of new research programs that are needed to advance that knowledge. The assessment primarily took place...
The subject matter of the book is divided into three subsections: Structure of Clouds, Interaction of Passive Radiation with Clouds, and Interaction of Active Radiation with Clouds. The first subsection addresses the formation of clouds. It contains papers by Hobbs on the scales involved in the formation and organization of clouds and precipitation, by Knollenberg on techniques for probing cloud microstructure, by Pruppacher on the microstructure of atmospheric clouds, and by Jiusto on fog structures.

This series of papers provides valuable but disorganized information on the state of knowledge on cloud formation. For example, Hobbs focuses on the formation and characteristics of extratropical cyclones while Jiusto focuses on the formation and characteristics of fog. A wide range of cloud forms in between are not discussed. Notably absent is information on formation and characteristics of tropical cyclones and convective clouds on all scales.

The Knollenberg paper provides an excellent summary of the present and future developments in particle measurements. It falls short, however, in claiming that it is impossible to solve many important cloud problems without rapid sizing and real-time data acquisition; not one cloud problem is identified.

Finally, the Pruppacher paper presents an excellent synthesis of the formation and characteristics of cloud and precipitation particles. Transcribed discussions at the end of the papers provide important additional information and clarifications.

The second subsection addresses the interaction of passive radiation with clouds, namely solar and terrestrial radiation. It contains papers by Cox on the radiation characteristics of clouds in the solar spectrum, by Hunt on the diurnal properties of clouds from geostationary satellite observations, and by Liou on the optical properties of ice clouds. Cox presents a useful summary of the effects of realistic multimodal droplet distributions and finite cloud geometric shapes on the radiative properties of clouds in the solar spectrum. Unfortunately, he did not relate the text to the bibliography, so the reader cannot determine the significance of the cited articles to the text.

Hunt provides information on the temporal behavior of clouds and the impact of this behavior on the earth’s radiation budget. This paper was an excellent catalyst; the subsequent transcribed discussion is as valuable as the paper.

Finally, Liou comprehensively reviews the light-scattering properties of ice crystals and the radiative characteristics of ice clouds. He presents remote sensing information which overlaps some information developed in the subsequent subsection, pointing to an unevenness in the organization and editing of the book.

An open discussion concerning the Cox, Hunt, and Liou papers is recorded following the Liou presentation. The record is useful but unfocused.

The final subsection addresses the interaction of active radiation with clouds, namely radiation from lidars. It contains papers by Carswell on laser measurements in clouds, by Platt on transmission and reflectivity of ice clouds, by Weinman on the theory of multiple scattering of lidar beams in ice clouds, and by Mooradian and Geller on pulsed blue-green propagation through clouds and fog. Taken as a whole, the series covers the main topics of remote sensing with lidars: single and multiple scattering cases, ice-water discrimination through polarization techniques, and cloud extinction and reflectance properties. Mooradian and Geller’s contribution contains graphic discussion of beam broadening due to increased cloud optical depth. There is considerable overlapping of subjects between the papers, especially the subject of multiple scattering.

The 11 review papers were designed to be tutorial in nature. Most of the papers achieved this goal. However, the detail varied from paper to paper, and consequently the book is most suited to the reader with a good background in atmospheric optics. It is not a basic text such as those by Deirmendjian (1969: Electromagnetic Scattering on Spherical Polydispersions, Elsevier) and Van de Hulst (1980: Multiple Light-Scattering, Academic Press). This book complements those texts, however.

I re-emphasize the recommendation of E. Raschke, in a recent book review in *EOS*, for open publications of such proceedings so the world-wide community can participate in those discussions of extreme importance to its research.

The inclusion of an author index along with the published subject index would have made the book’s information more easily accessible. Surely a softback version would be adequate for most needs and financially more appealing.

To conclude: the book is a good first attempt to summarize knowledge from the diverse fields of physics, atmospheric physics, meteorology, and electrical engineering. It should lead to the compilation of a textbook in which the subject matter is coherently and systematically developed with sufficient background information presented so the topics are evenly and thoroughly treated.—Edward E. Hindman

Edward E. Hindman is a Research Scientist, Research Institute of Colorado, Ft. Collins, Colo. and Research Associate, Dept. of Atmospheric Science, Colorado State University, Ft. Collins, Colo.


The present edition of Books in Print lists 21 books whose titles begin "Remote Sensing . . . . . ." With this plethora of books on a topic that can have so many definitions, it is important for the potential buyer, whether scientist or librarian, to be sure that the book in question fills the need in mind. For this book a more appropriate subtitle would have been the "European Perspective on Environmental Satellites, particularly LANDSAT and METEOSAT." The book chapters are actually lectures from a three-week summer school conducted by the European Association of Remote Sensing Laboratories at the University of Dundee in September 1980. There are 26 chapters in the book, of which 12 deal with a review of remote sensing concepts, data handling, and instrumentation methods. Five chapters are principally concerned with sensing of the oceans, four of the solid earth surface, snow and hydrology, and only the remaining five deal with meteorological problems.

Of the five meteorological chapters, one by V. Zwatz-Meise is a primer in nephanalysis, the interpretation of cloud band patterns, vortex configurations, cellular patterns, and uniform cloud areas (stratus). This topic is nicely reviewed with a number of illustrations. Methods for using the cloud pattern interpretations in a decision tree prognosis are also discussed.

Another chapter, by G. Warnecke and C. Zick, reviews the methods for cloud tracking for the determination of winds. The
merits of various time-lapse loops are discussed.

A third chapter, on the use of geosynchronous satellite images in the interpretation of climatic patterns, by R. Reynolds and A. Henderson-Sellers, may be quite useful to those teaching this subject. The authors identify a number of distinctive patterns that can be used in the interpretation of the poleward heat transport from tropical latitudes. They then describe how to use the visible and infrared images to obtain a climatological archive.

The two other short chapters on meteorology deal with pollution detection and dust storm studies.

Also featured in the book are the notes taken on field trips to assess land forms as ground truth; and the inclusion of worksheets for the laboratory exercises, again for assessing land-use types or snow cover.

Although this book might be useful for someone just entering the field of satellite remote sensing, the practicing meteorologist will probably find little that is new or useful in weather forecasting or for atmospheric research. If your organization is fortunate enough to have an unlimited library budget, then this book will probably make a useful reference to have on the shelf, but the high cost and specialized perspectives that it presents will probably prohibit its wide sale to individual meteorologists.—Freeman F. Hall, Jr.

Freeman F. Hall, Jr., is the Chief of the Infrared Doppler Lidar Program in the Wave Propagation Laboratory, NOAA Environmental Research Laboratories, Boulder, Colo.


This massive volume is directed—according to the flyleaf—towards architects, engineers, designers, planners, et al., with the aim of providing greater insight into the nature and effects of wind. While there are numerous selections of interesting material, the presentation is schizoprcnic—in places, page after page of computer-generated output; in other sections, relatively non-technical prose. The impression is of an effort to be all things to everyone and to include all material that could be assembled, without discriminating among the material or without focusing firmly on a coordinated approach.

The initial chapter, Winds, compiles smatterings from the ancient civilizations concerning the wind. Aside from the fact that the material seems out of place in such a “handbook,” the treatment is not really very comprehensive, nor are the references adequate. (Jakob Grimm’s broad coverage in Teutonic Mythology, for example, is overlooked.) In a list of terms used for winds across the globe, non-definitions such as “African monsoon—a monsoon of Africa” are found.

Destructive winds and their effects leads off with some loose presentations of concepts such as geostrophic wind, global wind patterns, etc. Geostrophic winds are “explained” in two sentences as the result of “simultaneous action of pressure, gravity [?] and the Coriolis force.” In an explanation of the general circulation, it is stated that a single-cell pattern from tropics to pole does not exist because of “seasonal changes and different heat radiations from continents and ocean surfaces.” The pattern presented instead includes “jet streams moving toward the poles at speeds over 200 mph.” The accompanying cross-sectional diagram implies that these high level winds descend to converge with surface westerlies (blowing north) at the pole! After nine meager pages on hurricanes, 90 pages are devoted to tornadoes and their effects. (In addition, a special “tornado” bibliography of 45 pages is included; many of these citations have nothing, however, to do with tornadoes.) Thunderstorm outflows, severe downslope winds, and destructive winds accompanying fronts and deep lows are not allotted any space at all.

Despite the great attention to aspects of tornadoes, the viewpoint expressed has not been brought up to date. The discussion on tornado phenomenology includes mention of the Symposium on Tornadoes in 1976, but the discussion of tornado wind speeds ignores a major observation from the Symposium which is included in the Proceedings. Kessler, in summarizing perspectives on tornado wind speeds (p. 431), concluded “there are today less than a half dozen apparently thoughtful observations of tornado effects that support winds in excess of about 250 mph. All are rather questionable on one basis or another.” Melaragno’s tornado shelter concepts (p. 147, ff) were first published in the 1950s as noted. However, the in-residence shelter concepts advanced in the 1970s by Kiesling and Goolsby (Civil Engineering, 4, 9, 105-107) are not mentioned.

Chapters 3 and 4, which address wind forces and their effects on buildings, are very much out of date, incomplete, and ill-organized. The author seems to have assembled a wide variety of information about wind effects, but has not helped the reader by organizing and reviewing this information in any rational manner. Hence, the best that can be said about the discussions of “aerodynamic wind forces” is that certain basic concepts are advanced. The reader will have to look well beyond the bibliographic material cited to obtain a current assessment of the state-of-the-art.

It should be noted, for example, that the author offers as the authoritative source for pressure coefficients the work of Ackett (1936), which was incorporated into the ASCE (American Society of Civil Engineers) task committee report on wind forces on structures (1962). Most of the results contained in these two publications are reproduced in the text (consuming 20 pages). Melaragno ignores the extensive and much publicized work conducted during the 1970s in boundary layer wind tunnels. In fact, he seriously misleads the reader (p. 204) by stating that “wind tunnels, originally built for aerodynamic testing of aircraft, can also be used for building design for wind forces.” The concept, value, and necessity of using boundary layer wind tunnels could have been included at this point, but the boundary layer wind tunnel is not mentioned.

With respect to completeness, the recurrence properties of the wind receive only a four-line paragraph in Chap. 2 (with three maps), with no mention in Chap. 4. This aspect of designing for wind is an essential part of the load development process. It is contained in all modern building codes and standards. Hence, any authoritative publication which purports to address aerodynamic wind forces should address this topic in considerable detail.

The organization of topics within Chap. 4 is poor. The reader is given no help in structuring an approach to the development of aerodynamic wind forces. The STRUDL II structural analysis program is introduced on p. 258 (p. 259 begins in the middle of a sentence), but the program printout suddenly appears on p. 280 (and consumes 40 pages). These computations are oriented towards structural analysis; thus, they have little to do with “aerodynamic wind forces.” It would appear that such information would appear more conveniently in an appendix, if at all.

The appendices included range from a list of WMO cloud types to a discussion of various forums where wind information is available, such as AMS meetings. How and where to obtain preprints or proceedings of such conferences are not given, however. The 43-page bibliography is grouped by topics; these do not follow the chapter
organization, they are not alphabetic, nor do they appear to be arranged in any discernible pattern. For such a massive volume and wide range of topics, the index is uselessly meager—6 pages. Many of the citations are specific wind names.

The plainest judgement of Melaragno’s tome is that an intended handbook became in the end only a bound collection of class handouts. Material is offered with little continuity or relationship to the whole. Worse than the organization of content, however, is the editing; it is inconceivable that a book viewed by a publisher as potentially useful could appear in print with so many shortcomings. Figures appear to be taped onto the pages—occasionally having slipped. Photographs are poorly reproduced. The layout is offensive as well in its waste of paper; while the pages measure 25.5 by 17 cm, over half of most pages are blank margins. In many cases figures are presented with no indication of the original source. Where references in the text do occur, the citations at the end of the chapter may be ludicrously brief—at times only a name and perhaps a year!

The book most likely will wind up on the shelves of many personal and public libraries; that, however, will be a shame. Meteorologists would probably not use the book, and would wince at the manner of presentation of fundamental meteorological concepts to those in other disciplines. Engineers would recognize the contents as a collection of hastily assembled information, largely out of date, lacking completeness and structure.—Richard E. Peterson, Joseph E. Minor, and Kishor C. Mehta.

Richard E. Peterson is an Associate Professor in the Atmospheric Science Group and associate of the Institute for Disaster Research. Joseph E. Minor is a Professor of Civil Engineering and Director of the Institute for Disaster Research, and Kishor C. Mehta is a Professor of Civil Engineering and associate of the Institute for Disaster Research, Texas Tech University, Lubbock, Tex.

new publications

Aerodynamics: The Science of Air in Motion [John E. Allen, 1982, Second Edition, 205 pp., $24.95, hardbound, McGraw-Hill Book Co. Ltd., 1221 Avenue of the Americas, New York, N.Y. 10020] is an extensive revision of the 1963 first edition, Aerodynamics: A Space Age Survey, incorporating information on subjects that have taken on greater significance in the past 20 years, such as energy, pollution, and noise. The greater power of calculation provided by the digital electronic computer has transformed many parts of aerodynamics and meteorology. New topics treated in this edition are aerothermochemistry, fluids, insect flight, and new classes of aircraft. The book includes a chapter on Natural Aerodynamics, describing the atmospheric winds and disturbances caused by natural processes, as well as the occurrence of vortices, circulations, boundary layers, and convective flows. Model experiments can help to explain these atmospheric flows and also to overcome problems in designing large buildings which must withstand the force of the wind. Other section titles include: Aerodynamics Through the Ages; The Nature of Air in Motion; Aerodynamic Theory and Experiment; Transport and Industrial Aerodynamics; Aeronautics; Aerodynamics in Space; and Aerodynamics and Civilization.

Cadmium in the European Community: A Prospective Assessment of Sources, Human Exposure and Environmental Impact [By Malcolm Hutton, 1982, MARC Report No. 26, 99 pp., $8.00, paperbound, Monitoring and Assessment Research Centre, Chelsea College, University of London, The Octagon Building, 459A Fulham Rd., London, England SW10 0XJ] "is concerned with establishing the relationship between cadmium dose and early signs of renal damage in humans and utilizing this relationship to define acceptable exposure levels to the metal. Data were extracted from several epidemiological studies of environmentally exposed populations from Japan and one group of occupationally exposed workers from the UK." This report, a modified version of one submitted to the Commission of the European Communities, includes a section on atmospheric concentrations of cadmium.

Causes and Effects of Stratospheric Ozone Reduction: An Update [Committee on Chemistry and Physics of Ozone Depletion and the Committee on Biological Effects of Increased Solar Ultraviolet Radiation, 1982, 339 pp., $13.95, paperbound, National Academy Press, 2101 Constitution Ave. NW, Washington, D. C. 20418]. "The purpose of the current study was to update [the National Research Council's] previous reports [for the Environmental Protection Agency] by assessing the most recent scientific information. The study was assigned to the environmental Studies Board within the Commission on Natural Resources of the NRC. The study was divided into two parts: first, an assessment of changes in understanding of the atmospheric chemistry and physics of ozone depletion, and, second, an examination of current knowledge about environmental and human health effects of the increased intensities of solar ultraviolet radiation that
The International Conference on Climate and Offshore Energy Resources was held October 21-23, 1980 at the Royal Society in London, England. The conference was jointly sponsored by the Royal Meteorological Society, the Society for Underwater Technology and the American Meteorological Society.

Eminent international scientists assembled to review and discuss at an interdisciplinary level, recent developments in meteorology and oceanography relevant to the harnessing of offshore energy resources. Papers were presented on the basis of current knowledge and understanding of climate with an eye to future implications for total energy demand and offshore production.

16 papers were arranged under the following session topics:

- **Climate, Energy and Man**
- **Studying the Atmosphere and Oceans**
- **Techniques of Prediction**
- **The Next 100 Years**
- **Offshore Energy Resources**

**Climate, Energy and Man**

**Studying the Atmosphere and Oceans**

**Techniques of Prediction**

**The Next 100 Years**

**Offshore Energy Resources**

$15 AMS Members

$25 Nonmembers

253 Pages (plus $2 postage/handling)

Send order and remittance to:

American Meteorological Society
45 Beacon St., Boston, Mass. 02108

would result from reductions in stratospheric ozone. EPA asked that the study emphasize the assessment of biological effects. Section titles include: Chemistry and Physics of Ozone Reduction; Biological Effects of Increased Solar Ultraviolet Radiation: Molecular and Cellular Studies; Ecosystems and Their Components; and Direct Human Health Hazards.

*Climate Data Sources in Connecticut* (Patricia A. Palley and David R. Miller, 1982, Storrs Agricultural Experiment Station Bulletin 461, 96 pp., $4.00 [make check payable to University of Connecticut], paperbound, from College of Agriculture and Natural Resources, Agricultural Publications, Box U-35, Storrs, Conn. 06268) "is a comprehensive listing of public and private weather stations in Connecticut. It includes for each station the location, the weather measured, the length of record, how the data are recorded, instruments used, calibrations performed, and the observer or contact. The text outlines the various types of weather stations and the types of instruments used to record each parameter. It summarizes the observations available with charts depicting record lengths both by county and state-wide and maps displaying the distribution of sites where each parameter is measured."

*The Glaciation of the Ecuadorian Andes* (By Stefan Hastenrath, 1981, 159 pp., $24.00, hardbound, A.A. Balkema Publishers, 99 Main St., Salem, N.H. 03079). "The High Andes of Ecuador are among the three regions of the World where glaciers still exist in immediate vicinity of the Equator. The area covered by ice caps and glaciers is only a small fraction of the total land surface and their influence on the regional climate may be of subordinate importance. However, glaciers in terms of their response to atmospheric forcing are extremely sensitive—albeit complex—indicators of large-scale environmental change. . . . The present study attempts to assemble an inventory of the current ice extent; to reconstruct glacier variations in the course of the past several centuries; and to infer glacial-climatic events in the more distant geological past." Section titles include: Physiographic structure; Atmospheric circulation and climate; Western Cordillera; Eastern Cordillera; Older glaciations; and Subnival soil forms.

*Hot-wire Anemometry* (By A. E. Perry, 1982, 184 pp., $47.00, hardbound, Oxford University Press, 200 Madison Ave., New York, N.Y. 10016) "is concerned with the fundamental principles of hot-wire anemometry as applied to the study of turbulence and unsteady laminar flow in subsonic wind-tunnel experiments." Section titles include: Hot-wire filaments and simple models; Constant current hot-wire anemometer for the measurement of velocity fluctuations; The constant current method for measuring temperature fluctuations; Constant temperature hot-wire anemometer or the measurement of velocity fluctuations; Influence of resistance ratio on constant temperature system response to velocity and temperature fluctuations; The aerodynamic behaviour of hot-wire anemometer filaments in an air stream; and Calibration, measurements, and corrections for constant temperature systems.

PREPRINTS

The volume of papers presented at the Third Conference on Hydro-meteorology includes the following topics:

- General
- Estimation of Meteorological Variables
- Data Acquisition
- Design Criteria
- Hydrologic Simulation or Modeling

141 pages $15 AMS Members
$20 Nonmembers
(add $2.00 postage/handling)

Send order and remittance to:

AMERICAN METEOROLOGICAL SOCIETY
45 Beacon St.
Boston, Mass. 02108

---

By Fawwaz T. Ulaby et al., 1981, 456 pp., $46.50, hardbound, Addison-Wesley, Advanced Book Program/World Science Division, Reading, Mass. 01867. "is designed to cover remote sensing subjects with the breadth and depth required for use by students in graduate level courses and at the same time to serve as general reference texts for remote sensing engineering and applications scientists. . . . [This volume] starts out with an introductory chapter on the history and applications of active and passive microwave remote sensing, followed by introductory treatments of electromagnetic wave propagation (Chapter 2), antennas (Chapter 3), and microwave interaction with atmospheric constituents (Chapter 5). These three chapters are intended to provide a review of those fundamental aspects of remote sensing that are common to all types of microwave sensors. The major topic of Volume I is microwave radiometry, which is treated in Chapters 4 and 6 and the latter part of Chapter 5. Chapter 4 begins by introducing radiometric concepts and quantities of interest, and then proceeds to treat the radiometric measurement problem for atmospheric and terrestrial sources of natural radiation. Emission by atmospheric gases, clouds, and rain is covered in Chapter 5 using the radiative-transfer formulations developed earlier in Chapter 4. Chapter 6 discusses the operation and performance characteristics of radiometer receivers, with special emphasis given to measurement precision, calibration techniques, and imaging considerations."

---

Physico-Chemical Behaviour of Atmospheric Pollutants
B. Versino and H. Ott, Eds., 1982, 672 pp., $78.00, hardbound, Kluwer Boston, Inc., 190 Old Derby St., Hingham, Mass. 02043. contains the proceedings of the Commission of the European Communities' Second European Symposium held in Varese, Italy, 29 September-1 October 1981. The book "represents an almost complete overview of the work presently done in this field in Europe, corresponding entirely to the given tasks of co-ordinating the European research effort." Section headings include: Identification and analysis of pollutants; Chemical and Photochemical Reactions; Aerosols; Pollutant Cycles; and Transport and Modeling—Field Experiments.

---

Planets of Rock and Ice: From Mercury to the Moons of Saturn
Clark R. Chapman, 1982, 222 pp., $13.95, hardbound, Charles Scribner's Sons, 597 Fifth Ave., New York, N.Y. 10017. is a completely revised and greatly expanded edition of the author's The Inner Planets. The earlier book concentrated on the rocky, terrestrial bodies, from the innermost planet, Mercury, out to the asteroid belt; the focus is now extended beyond the belt to embrace the rocky and icy bodies studied by the Voyagers: the moons of Jupiter and Saturn and the countless moonlets that compose the Saturnian rings. The subject is mainly the smaller, solid planets and satellites and their relatively thin atmospheres. Chapter titles include: Planetologists; Craters: Planetary Chronometers; Uniformitarianism and Catastrophism; Fragments from the Solar System's Birth; An Inner Planet Revealed; The Inside View; The Vapors of Venus and Other Gassy Envelopes; The Moon: What Did We Learn from Apollo; Galileo's Worlds of Ice, Rock, and Sulfur; Saturn Encounter: Resplendent Rings, Exotic Moons; Mars: Changing Perspectives; The Earth in Its Planetary Context; and The Galileo Project and the Future of Planetary Science.

---

Scientific Basis of Water-Resource Management
Geophysical Study Committee, Geophysics Research Board, Assembly of Mathematical and Physical Sciences, National Research Council, 1982, 127 pp., $12.25, paperback, National Academy Press, 2101 Constitution Ave., Washington, D.C. 20418. "In 1974 the Geophysics Research Board completed a plan, subsequently approved by the Committee on Science and Public Policy of the National Academy of Sciences, for a series of studies to be carried out on various subjects related to geophysics. The Geophysics Study Committee was established to provide assessments from the scientific community to aid policymakers in decisions on societal problems that involve geophysics. An important part of such an assessment is an evaluation of the adequacy of present geophysical knowledge and the appropriateness of present research programs to provide information required for those decisions. This study
was motivated by the perceived need for substantial improvements in the hydrologic sciences to enable more firmly based decisions involving water. . . . The papers provide examples of our current geophysical knowledge base in hydrology and how that knowledge base interacts with the management and planning of our water resources." Paper titles include: Models of Runoff Processes and Their Significance; Hydrology and Climate; Implications of the Vadose Zone to Water-Resource Management; Groundwater: The Water-Budget Myth; Quality of Water—Surface and Subsurface; Predictive and Reactive Systems for Aquatic Ecosystem Quality Control; Robust Estimators in Hydrology; Empirical and Causal Models in Hydrology; Field Data: The Interface Between Hydrology and Geomorphology; Geology, Determinism, and Risk Assessment; and Prediction in Water Management.

Summary of Weather Modification Activities Reported in 1981 [Mason T. Charak, 1982, 44 pp., n.p., paperbound, U.S. Department of Commerce, National Oceanic and Atmospheric Administration, Office of Research and Development, Atmospheric Programs Office, Rockville, Md. 20852] "summarizes weather modification activities conducted in the United States and reported to the National Oceanic and Atmospheric Administration in calendar year 1981. Information is presented on the purposes, locations, sponsors, operators, equipment, techniques, target areas, seeding agents, seeding duration, operational procedures, and environmental factors associated with the activities. The data for 1981 are compared with the data reported for 1973-1980, and some trends are noted."


Tropospheric Passive Remote Sensing [Lloyd S. Keafer, Jr., Ed., 1982, NASA Conference Publication 2237, 94 pp., n.p., paperbound, from NTIS] contains the proceedings of a workshop sponsored by the NASA Office of Space Science and Applications and the NASA Office of Aeronautics and Space Technology, conducted by Langley Research Center and held in Virginia Beach, Va., 20–23 July 1981. The purpose of the workshop was to define the long-range role of passive remote sensors in tropospheric research and identify the technological advances necessary to implement that prescribed role.