reviews

Medical Climatology. Edited by Sidney Licht with the assistance of Herman L. Kamenetz. New Haven, Elizabeth Licht Publisher, 1964. 753 pages. $16.00.

The vast progress of technology has imbued man with the feeling of mastery of and independence from the elements. Licht's *Medical Climatology* is a welcome and timely reminder of the importance and influence of the natural environment.

Twenty-eight lucid and well presented chapters, authored by 17 noted American and 14 foreign scientists from Western and Eastern Europe, deal with various aspects of biometeorology. The guiding spirit of two internationally known experts, Drs. Landsberg and Sargent, are clearly recognizable in the selection of some of the authors. Minor inaccuracies, usually unavoidable in the process of translation, do not detract from the excellence of this long overdue volume.

Even the most skeptical observer will have to admit that in spite of the great progress of medical sciences, climatotherapy has not been superseded by a better or more effective method. In fact, the need for this form of therapy is today more urgent than ever. The preventive and restorative potential of natural factors has been underestimated in this country for a long time. The knowledge and experience of the continental contributors will be helpful in restoration of the sagging confidence and lead to realization that selected natural resources are intrinsic segments of all therapeutic endeavors.

The dense clouds of air pollution and the diminishing quantity and quality of water supplies cast long shadows engulfing all metropolitan areas already smothered by overpopulation. In addition, the prevailing trend to a sedentary way of life in a physiologically strange and irritating urban conglomeration, calls for definite preventive measures to stem the wave of somatic and mental deterioration. A planned, organized and medically supervised sojourn in geographically and climatically suitable locations is not only a popular escape from the grinding daily routine but a vital necessity for restoration of health.

It is obvious that ideal climates fit for all kinds of functional and organic ailments are not extant. Still, favorable surroundings and the relaxing or stimulating geopsychic factors cannot be reproduced even in the most sophisticated artificial milieu.

Licht's compendium, a beacon in a vast and little explored field, opens new vistas and paves safer approaches to biometeorological problems. It is the missing inter-disciplinary link between medicine and meteorology dealing not only with the impact of weather and its components on the physiological mechanism but also pointing to a remedy in the never ending struggle for better health and enjoyment of life.—*Igho H. Kornblueh*

Physics of the Earth's Upper Atmosphere. Edited by C. O. Hines, I. Paghis, T. R. Hartz and J. A. Fejer. Englewood Cliffs, New Jersey, Prentice-Hall, Inc., 1965. 434 pages. $17.35.

The past decade has brought remarkable increases in knowledge of the earth's upper atmosphere, largely as a result of studies stimulated by availability of improved rocketsondes and satellite probes. Readers seeking a good summary of the decade's findings in the general area of ionospheric and magnetospheric phenomena will welcome this book.

Primary emphasis, throughout much of the assembled writing by the book's thirteen authors, is put on description of process and structure rather than on underlying mathematical theory, though enough of the latter is provided that the book offers an excellent entry into the rapidly developing field it covers. Despite its being largely descriptive in nature, the book assumes that the reader has a fairly extensive background in physics. It is concerned almost entirely with processes occurring above the stratopause and thus rather nicely complements Craig's new text on *The Upper Atmosphere* (Academic Press, 1965), which places principal emphasis on stratospheric phenomena. Doubtless the day is past when any single work can do full justice to the entire group of topics conventionally lumped under the heading of upper atmosphere physics. Mitra's classic book may be the last of its kind.

Following a general introduction and a brief survey of solar optical radiation and its attenuation in the atmosphere, the ionospheric regions are examined in detail. Emphasis is placed on clarifying present conceptions of the principal ionization and recombination processes at levels ranging from the *D*-region out to the limits of the *F*-region and on into the trapped-particle zones bounded by the magnetopause. Then, after taking stock of present understanding of the dynamics of the neutral upper atmosphere, the ionospheric dynamo motions and attendant charged particle motions are examined. The foregoing topics form the background for the remaining eight chapters devoted to the principal ionospheric and geomagnetic disturbances (ionospheric noise, geomagnetic micropulsations, flare-induced SID and PCA events). Finally, in view of the great practical significance of ionospheric and magnetospheric studies as related to radio propagation, a rather detailed Appendix on the physics and some of the mathematics of electromagnetic propagation in homogeneous and inhomogeneous plasmas is included for readers seeking further theoretical background.

Physics of the Earth's Upper Atmosphere is not likely to be used as a principal text in meteorology courses on the upper atmosphere, since its emphasis is on regions of the atmosphere lying above those on which the graduate me-

teorologist must concentrate; but it definitely belongs on the shelves of all meteorological libraries. And individual readers seeking rather more than a first orientation in the rapidly evolving field of aeronomy will find the book an excellent introduction to those portions of that field which deal with ionospheric and magnetospheric phenomena.—*J. E. McDonald*

Earth Science—The World We Live In. By Samuel N. Namowitz and Donald B. Stone. Princeton, N. J., D. Van Nostrand Company, Inc., third edition, 1965. x + 597 pages with photographs, drawings, and 12 pages of color plates. $5.60.

With the inclusion of earth science in the curricula of a continuously increasing number of secondary-school systems in the United States, the appearance of pertinent new textbooks and teaching materials is to be expected. The book under review is, however, no newcomer, having first appeared in 1953, when it was still a rare school that offered earth science to its pupils. According to the Preface, this third edition is enlarged, rearranged, and brought up to date. However, considering the time lag between completion of a manuscript and the printed form of a book, no text can be really up to date in all its aspects; so, *e.g.*, Chapter 26, entitled "Exploring Space," contains as the last manned space flight that of May 1963 (p. 381). Also, extensive revisions of a text with retention of older illustrations often lead to incompatibility of the two; *e.g.*, on p. 432 the outer limit of the atmosphere is placed "at about 22,000 miles" whereas Figs. 32-1 and 32-3 on pp. 449 and 450 still carry a label of 700 miles for the height of the atmosphere.

This very attractively printed and, on the whole, excellently illustrated book is divided into nine units and forty chapters, each chapter containing a number of "Topics"; at the end of most chapters sets of "Topic Questions," "General Questions," "Student Activities" and, where appropriate, "Topographic Sheets" are appended. In general, the questions tend to stress the students' understanding of the material more than their mere retention of facts. The Units are entitled: I. The Crust of the Earth; II. The Crust Undergoes Attack; III. The Crust Is Raised; IV. The Oceans of the Earth; V. Earth History; VI. The Earth and the Universe; VII. The Atmosphere: Weather Elements; VIII. The Atmosphere: Making of the Weather; IX. The Earth and its Climates. An appendix of two pages listing the principal minerals and their characteristics is followed by a "Bibliography" of slightly more than 5 pages, a "Glossary" of 15 pages, and almost nine pages of "Index."

As practically all earth science texts this book, too, is heavily biased toward geology which occupies about the same amount of space (roughly 270 pages) as oceanography (44 pages), astronomy (107 pages), and meteorology (130 pages) together, although one-third of the Units are devoted to the atmosphere. A similar bias is obvious in the bibliography in which, deplorably, there is no reference to WEATHERWISE. This text, too, suffers from the usual taxonomic and descriptive approach and from a submersion of the main ideas and principles in an overwhelming amount of facts (too many of which must seem extremely uninteresting to pupils in junior or senior high school). There are several promising starts at developing themes in an engaging manner, partly on an historical basis, as, *e.g.*, Chapters 4, "Origin of the Rocks," 14, "Earthquakes," and 17, "Exploration of the Sea," but endless catalogues of facts, descriptions and terminology prevail. One cannot refrain from wondering how much understanding of earth science a student will carry away from high school after such massive inundation of his memory capacity, and whether he will have at least a fair idea about the various kinds of work available to professional geologists, oceanographers, meteorologists, etc.

The style of writing is, on the whole, quite good, although one would wish that some hard-boiled editor had restrained the authors' occasional tendency of becoming journalistics, when they apparently strained at vivid writing. Also a blue pencil should have straightened out such awkward sentences as: "Here they are unreached by the rainy doldrums at any time of the year" (p. 553); ". . . its front . . . underrides and lifts the warm front . . ." (p. 516); or, regarding sunspots, "Between two maximums, the number usually drops to a minimum . . ." (p. 349). And was it an intentional tribute to ignorance when the authors wrote (p. 347): "Our sun is still unique, however, as the possessor of the only planet known to have life on it"?

Scattered throughout the text, though not systematically, are phonetic codes for the pronunciation of names and scientific terms and etymological explanations. However, the selection is somewhat puzzling; it is not easy to see, why a student would have difficulties in pronouncing words like "galaxy" (p. 322) or "isobar" (p. 453), but not with "Globigerina" (p. 248) or "Betelgeuse" (p. 330). The pagination of the book was apparently left to the caprice of a designer who was more concerned with artistic arrangements of the pages than with the convenience of the reader; page numbers can be found at the top or the bottom of the pages if there was anywhere a convenient space for them, otherwise they were omitted.

Before commenting on the three Units dealing with the atmosphere, which are probably of greatest interest to the readers of the AMS BULLETIN, I would like to remark on two points that struck me strangely in perusing the text: In Unit V, "Earth History," which has an excellent introduction describing geologic dating methods, only paleobotany and paleozoology are treated, man appearing only in a "Geologic Timetable" (p. 279); one would think that youngsters would be curious enough to read a few paragraphs on the evolution of man. And then in Chapter 26, "Exploring Space," an embarrassing provincialism becomes obvious: after devoting more than two pages to U. S. space achievements with unmanned and manned flights, ending with Gordon Cooper's 34-hour space trip, the authors condescendingly add the one-sentence paragraph: "Astronauts of the Soviet Union have made orbital flights lasting several days" (p. 381).

The last ten chapters (31 to 40) on the atmosphere have the following titles: "The Atmosphere and Solar Radiation"; "Atmospheric Pressure and Winds"; "General Circulation of the Atmosphere"; "Evaporation and Condensation"; "Precipitation"; "Air Masses and Fronts"; "Storms and Weather Forecasts"; "Light in the Sky"; "Factors that Control Climate"; "Climates of the World." The coverage and arrangements of the various topics follow the usual pattern of elementary texts; unfortunately, the authors also perpetuate some of the conventional oversimplifications and errors commonly found in popular versions of meteorology. For example, it is to be hoped that teachers using this text will discourage their students from believing that "A Torricellian barometer is easily made . . ." (p. 449) and from trying to make one in view of the toxicity of mercury. While the text