no doubt that most of the individual chapters have immense value as contributions to the literature of the chimpanzee. Keleman's chapter on laryngeal anatomy, although it reads as if it had been badly translated from the author's native tongue, is precise and informative. Primatologists and psychologists will relish the unequivocal, infinitely quotable statement that the anatomy of the larynx of the chimpanzee makes it entirely impossible for this animal to reproduce the phonetic elements of human speech. The lengthy chapter by Shantha and Monocha on the chimpanzee brain is a meticulous and highly specialized, if unfunctional, neuroanatomical treatise. Schultz's chapter on the chimpanzee skeleton is a welcome synthesis of the author's unique knowledge of growth and variation of the higher primates. Krogman's chapter on growth changes in the skull and dentition is an exemplary presentation of known facts, though it is not an easy read. There is inevitably some overlap between Krogman's and Schultz's contributions; one could have wished that Krogman was as up-to-date on Schultz's work (on cranial capacity, for example) as Schultz himself is. Rewell's comprehensive chapter on intestinal infections is marred by nomenclatorial inadequacies, *Macacca cynomolgus* [*sic*], *Maccaca pileatus* [*sic*], *and* (save the mark) *Seniocebus leucopus*. One might have expected that a volume deriving editorially from a major primate research establishment would have done better than this.

I find it hard to excuse the inadequacies of this book as a whole, which, from its misleading title to its nomenclatorial imperfections, does scant justice to its distinguished contributors.

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Information on Fisheries

The Encyclopedia of Marine Resources. FRANK E. FIRTH, Ed. Van Nostrand Reinhold, New York, 1969. xii + 740 pp., illus. $25.

The oceans, or "inner space," have lately attracted a degree of attention only slightly less than outer space. This interest has created a demand for easy access to information on marine resources. The present volume attempts to fill this demand; it is to be regretted that the attempt is not entirely successful.

A major shortcoming is incomplete coverage; of some 150 contributions all but about a dozen deal with fisheries and related biological subjects. Of the authors, over 70 percent come from the United States, and three-quarters of the rest are from other English-speaking countries. A book can hardly claim to be an encyclopedia of marine resources with no contributions from countries with such vast programs of research and exploitation as the U.S.S.R. and Germany and with only two from Japan.

Even within the restricted scope of the living resources of the waters around North America there are some very apparent gaps. The problems of conservation and management of overexploited stocks receive no explicit treatment, though touched on in several articles; similarly, the references to the various international fishery commissions, which are such a feature of the modern fishery scene, are very few, and sometimes erroneous; for example, neither the International Commission for the Northwest Atlantic Fisheries (ICNAF) nor the Northwest Atlantic Fisheries Commission (NEAFC, not ICNEF) employs its own biologists to evaluate the statistics.

It is probably inevitable that the contributions to this type of volume should be highly variable, but there appears to be an unnecessary amount of second-rate material. Partly this is due to the rather broad subjects of many articles, so that particular topics are touched on briefly in several places. Thus the mode of operation of an otter trawl is discussed in a paragraph or so in some half-dozen articles (cod fishery, redfish fishery, and others) but there is no detailed description of the modern trawl and its many variations. Incidentally, it is not true (as is stated on p. 582) that "it is a marvel of ingenuity that this mixture of netting and heavy doors, rollers and cables, dumped over the vessel's side en masse, lands on the bottom in proper position and functions perfectly." If this ever happened it would be a miracle.

These faults should not detract from the usefulness of many of the articles: the drawings of fishing vessels by Hitz are a pleasure to look at as well as being clear and informative; the article by Manar on Pacific fisheries—tropical and subtropical—gives clearly the information one expects from such a heading (but why no equivalent articles for Atlantic fisheries, or for the North Pacific?). A number of useful articles do not, however, make a good encyclopedia.

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Infrared in Medicine

Medical Thermography. Proceedings of a Boerhaave Course, Leiden, 1968. S. F. C. HEERMA VAN VOSS and P. THOMAS, Eds. Karger, Basel, 1969 (U.S. distributor, Phiebig, White Plains, N.Y.). viii + 224 pp., illus. Paper, $15.60. Bibliotheca Radiologica, No. 5.

Thermography, one of the newer diagnostic methods, was introduced to medicine in 1956 and since that time has received considerable attention from the medical and scientific world. Although over 200 articles concerned with this subject appear in the literature, there are only two books about it. The first book, *Thermography and Its Clinical Applications*, was published in 1964 as volume 121 of the Annals of the New York Academy of Sciences and like the second, which is being reviewed here, was a collection of papers from a conference. It differs in that most of the contributors are Americans. The contributors to the Boerhaave Course are with one exception European investigators, and this book is a reflection of current efforts on the continent in the field of infrared thermography. Like its predecessor, this volume includes discussions of history, instrumentation, technology, and clinical applications in breast diseases, vascular disturbances of the extremities, and cerebrovascular disorders.

Very little that is new can be added to the history of infrared. During the interval between conferences improved technology has developed in the form of several new instruments—notably the AGA Thermovision and the Bofors IR-Camera. In the reviewer's experience, these two instruments, which are manufactured in Sweden, are the finest equipment for rapid screening that is now available. Both are discussed in this publication. Unfortunately, the latest technological advancement, color thermography, is not included.

Much that is presented concerning results in breast diseases, peripheral vascular problems, and cerebral vascular insufficiency is not new. This very fact is a point of some importance because it shows that the work of earlier investigators is substantiated and demonstrates the reliability and reproducibility of the results of thermography carried out with a variety of instruments.

The sample size is uniformly small, and arthritic diseases, orthopedic problems, and several other uses reported earlier are not mentioned. This minor weakness is adequately compensated by discussions of a number of previously unreported applications.

A unique feature of this book is the introduction of the concept that thermography should be considered a functional method. Readers with some experience in thermography will find the article by Heerma van Voss, which introduces this concept and discusses it in relation to cerebrovascular insufficiency, particularly interesting.

This collection of papers, which suggests a wider usefulness for this technique than was previously appreciated, is recommended for all those interested in the field of medical infrared and particularly for students of thermography, from paramedical personnel to clinical researchers.

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Events around the Sun

Mass Motions in Solar Flares and Related Phenomena. Proceedings of the ninth Nobel Symposium, Capri, Italy, 1968. YNGVE ÖHMAN, Ed. Interscience (Wiley), New York; Almqvist and Wiksell, Stockholm, 1968. 246 pp., illus. $22.

Solar flares and the phenomena related to them are the most spectacular events observed in the sun's atmosphere. Their very transient nature, their rapid changes in brightness and temperature, the violent motions of material seen in surges, sprays, and eruptive prominences, strong radio emissions, and the ejection of corpuscular radiation into space are all manifestations of very complex electromagnetic interactions which occur in active regions, usually at or near sunspots.

This book consists of papers presented at a 1968 symposium whose expressed purpose was primarily to study the mass motions in solar flares. This in itself is worthy of note, since most workers in the field have considered flares to be stationary phenomena. There is, to be sure, an apparent motion as a flare develops: the area of the chromosphere (usually observed in the hydrogen alpha line at 6563 angstroms) which is at flare brightness expands, contracts, moves across the surface or up or down at the limb. Is this, however, a true mass motion, or just heating of the region by an exciting medium (such as a shock wave) as this medium moves through the region? The latter view is the more widely accepted. Only velocities measured spectroscopically by the Doppler effect can unambiguously resolve this argument, and such measurements usually indicate little or no line-of-sight motion during a flare. This fact is related to the origin of the use of the term "flare" by McNish in 1937 to describe this solar phenomenon. For 45 years prior to that time, George Hale's "bright chromospheric eruption" terminology had been in vogue. But the word "eruption" implied a violent motion and outburst of material, which contradicted the observations, and astronomers abandoned this term in favor of the more descriptive "flare" in the early 1940's.

Thus the papers collected in this book, in order to discuss mass motions in flares, deal extensively with flare-related phenomena, such as sprays, surges, moustaches, loops, ejections, and eruptive prominences, some of which exhibit velocities up to 1000 to 1500 kilometers per second. Over three-fourths of the book consists of papers describing observations of flares and related phenomena; only a small section deals with theoretical aspects.

The reader, especially the newcomer to the field, will find the book most useful as an up-to-date compendium of our current knowledge of flares; it will be most valuable when read in conjunction with an earlier book by Smith and Smith (*Solar Flares*, Macmillan, 1963). This reviewer particularly enjoyed the introductory review paper by Švestka and the paper by Severny on the phenomena he calls "moustaches" (because on negatives they appear as broad dark wings in Fraunhofer line spectra) or "solar hydrogen bombs" (the term first used by Ellerman in 1917) among the observational articles. In addition, several authors (Öhman, Severny) discuss evidence for spiraling motions and twisted or helical magnetic fields in loops and prominences, the latter perhaps due to currents flowing in these regions. The release of magnetic energy from such twisted field configurations is a possible source of the energy ($\sim 10^{32}$ ergs) observed in a flare, and thus a most important theoretical consideration.

Theories of flares have been as numerous as they have been unsuccessful. Up to now, one still does not know enough of the temperature, densities, and magnetic fields in a flare to give the theorist much assistance. General comments on the requirements of a successful flare theory are discussed in papers by Gold, de Jager, and Kiepenheuer. There has been a tendency to describe theories which are to explain all flares. Such efforts seem doomed to failure, since it appears that there are several different types of flares, most likely due to different causes. One type of flare that is relatively amenable to analysis is the two-ribbon flare which Hyder attributes to an infall-impact mechanism: material falling from the corona impacts upon the chromospheric material, heating it to flare brightness. Clearly such a phenomenon is completely different from the release of energy through the annihilation of magnetic fields, which many theorists consider to be the primary cause of flares and which forms the basis for the remarks by Gold and de Jager, and the theories presented by Alfvén and Carlqvist. To confirm one of these latter theories, even to discriminate between them, is most difficult, since the changes in magnetic field strength (less than 100 gauss) necessary to produce the observed effects not only are usually too small to be measured accurately, but also may occur too quickly to be noticed, and, most importantly, are measured in the photosphere, that is, at a height in the atmosphere quite different from that of the optical flare observed in the chromosphere or corona.

The book concludes with articles by Godoli and Zirin on associated phenomena in stars other than the sun. In summary, this book serves as a good introduction to the very complex subject that is the solar flare. It demonstrates the difficulty of making definitive observations and of interpreting those that exist, and illustrates the wide diversity of current theoretical explanations, which will not be resolved for some time to come.

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