black-and-white photography and hence are just as useful today as they were yesterday. Allen's personal comments are apt and reflect years of experience. My review is intended to indicate the scope and place of the book and not to criticize an elder statesman of microscopy.

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**Historical Geography of the North Carolina Outer Banks.** Gary S. Dunbar. Louisiana State University Press, Baton Rouge, 1959. xii + 234 pp. Illus.

This well-written, logically organized, well-documented book deals with the barrier island chain between North Carolina's Cape Lookout and the Virginia line. These barrier islands lie far from the mainland. Since so much of the Banks consists of sandy waste, the reader constantly asks himself what it was that attracted the original settlers.

Though Roanoke Island is not a part of the Outer Banks, it is included in the study because of its proximity, cultural similarity, and historical significance. It was selected by the English settlers under Raleigh as the site for a colony and as a base from which to launch raids on the Spanish Indies; but, as the author brings out, the English "could not have made a worse selection." This colony became the "lost colony"; what happened to it is not known, but destruction by Indians seems probable. The colony contributed nothing to the permanent settlement of the Banks. The Jamestown colony of 1607, however, was able to start with a somewhat better knowledge of the topography and natural resources as a result of the Roanoke experiments.

It is primarily to describe the nature of the settlements of the Carolina Banks that this study was made and that the volume was published. An interesting and valuable part of the study deals with the introduction of plants by the settlers, who envisioned them as profitable export products; the new settlements positively had to produce some item or items needed by the mother country. Cultivation of mulberry trees for a silk industry, viniferous grapes, figs, lemons, almonds, olives, and cassava was tried; most of these projects either failed completely or showed little promise of success. By this time, however, the Virginia agriculturists had found in tobacco the economically successful crop they sought.

The author points out the value to the white settlers of the cultivated Indian plants—in particular of the great "crop trilogy," maize, beans, and cucurbits. Indian stores of corn were invaluable in helping the colonists through the first winters.

The first permanent settlement on the Outer Banks was made in the 1660's; almost all of these settlers were Virginians, who by this time had solved most of the problems of pioneering in the New World and who brought with them the Virginia system of growing tobacco on riverine plantations and of rearing livestock on necks and islands. The first homes on the Outer Banks were all built on the "hammocks" (variant of "hummocks")—wooded tracts usually slightly above the surrounding area and on the sound side. These "hammocks" are also the homesites today. Yards and gardens were enclosed by fences to protect them from roving livestock.

Fishing in the sound waters soon became an important activity. Menhaden fishing was unsuccessful, however, because the water in the sounds is so shallow that fish do not congregate there in great numbers and purse seines cannot be used effectively. North Carolina's impressive menhaden-fishing industry is carried on in outside waters and hence is of no direct concern to the "Bankers."

The tourist business seems to hold about the only promise for the "Bankers" today. A flood of tourists descends on the Banks each summer, raising the incomes of all local residents.

Extensive and detailed notes cover each chapter in this book; these are so interesting and so informative that even the casual reader finds himself delving into them. The person much interested in the area would find these notes one of the most satisfactory parts of the volume. The cartographic work is of high quality—accurate, meaningful, and pleasing to the eye. There is an excellent bibliography and a helpful index.

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**The Measurement of Values.** L. L. Thurstone. University of Chicago Press, Chicago, 1959. viii + 322 pp. $7.50.

This volume brings together 27 of Thurstone's hitherto scattered papers on the measurement of attitudes and subjective values. Included are all of his classic contributions to psychophysics.

When Thurstone went to the University of Chicago in the 1920's he began a sweeping reanalysis of the logic of psychophysics, the field of inquiry started by E. H. Weber and G. T. Fechner in an attempt to develop rigorous statements of the relations between sensations and the stimuli that produced them. One of Thurstone's distinctive contributions was to develop experimental methods and a rationale for dealing with values, attitudes, and similar subjective variables that cannot be related to physical quantities.

Thurstone's papers on subjective measurement and attitude measurement pretty completely made over the field of psychophysics, replacing its former limitations with a wide range of useful applications in the social sciences and substituting a systematic and meaningful understanding for the empirical "Weber's law" and "Fechner's law." Such papers as "A law of comparative judgment," "A mental unit of measurement," "Rank order as a psychophysical method," "The indifference function," "Theory of attitude measurement," and "The measurement of change in social attitude" are essential reading for any student of psychological measurement. But copies have been increasingly hard to acquire. The new book solves that problem and will be of great convenience.

The idea for the collection came originally from some of Thurstone's former students, but he himself was largely responsible for selecting the papers to be included. Mrs. Thurstone, always his close professional colleague, prepared an explanatory preface and saw the volume through the press.

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**Inside the Living Cell.** Some secrets of life. J. A. V. Butler. Basic Books, New York, 1959. 174 pp. Illus. $3.50.

Perhaps the most useful way to evaluate this book is to compare it with R. W. Gerard's *Unresting Cells,* published almost 20 years earlier. Both books are popularizations of cell physiology, but popularizations at a very high level of sophistication. Each presents a view of the facts as seen through the prism of the author's own lucid and critical intellect. Both books are excellent.

It is interesting to note the large number of topics in Butler's book that were either entirely unknown in 1940 or but dimly foreshadowed: the existence and importance of deoxyribonucleic acid (DNA) and ribonucleic acid (RNA); heredity as a problem in code construction; the Watson-Crick model of DNA replication; the role of antivitamins; the relation of genes to enzymes, as shown by the Beadle-Tatum school; the strange behavior of bacteriophages; and Oparin-style theories of the origin of life. Who

could have foreseen such developments 20 years ago? (And what will be the living ideas in cytology 20 years hence?)

The only substantial adverse criticism that might be offered is of the photographic reproductions. The originals of these—electron micrographs of mitochondria, microsomes, viruses, chloroplasts, and muscle fibrils—are things of great beauty, but most of the beauty has unfortunately been lost in the reproduction. For the layman who is seeing these pictures for the first time, the plates will do, because he doesn't know what he is missing, but it is a pity they are not better. The author no doubt agrees with this criticism.

Toward the end of the book Butler branches out considerably from his stated topic to consider mind, instincts, memory, free will, ageing, death, and the purpose of it all. Admittedly, it may be possible some day to discuss many of these topics on a cytological basis, but that day still seems a long way off. However, since the author's discussions are short and often illuminating, one does not begrudge him these diversions. It is Tennyson's "flower in the crannied wall" again: it is only natural for the serious and thoughtful specialist to fancy he sees real connections between the tiny object to which he devotes his life and the cosmos itself. Sometimes he is right.

The author's approach is, throughout, a quantitative one; he emphasizes the importance of thinking in terms of exponential numbers and orders of magnitude. This approach may repel the layman who has become allergic to "math" (may his tribe decrease!), but it is certainly the best approach. At least physicists, chemists, and other scientists who are laymen in the field of cytology will find this a stimulating and informative work. It deserves to be as widely read as its great predecessor, *Unresting Cells*.

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**Communist Economic Strategy: The Role of East-Central Europe.** The economics of competitive coexistence. Jan Wszelaki. National Planning Association, Washington, D.C., 1959. xii + 132 pp. $3.

This book, the first volume in the National Planning Association's series on the economics of competitive coexistence, is useful in assembling a variety of data on the trade of East-Central Europe with the Soviet Union and with the underdeveloped countries of the Far and Middle East. Its thesis is that East-Central Europe provides an industrial base which is important to the Soviet Union, both directly and in the latter's attempt to penetrate economically and politically into underdeveloped countries. At the same time it is admitted that the countries of East-Central Europe need raw materials and foodstuffs and that they are obliged to trade with the Soviet Union and tropical areas in order to acquire them.

The study is a short one, and it pays only limited attention to the evolving background of industrial and agricultural production in Poland, East Germany, Czechoslovakia, Hungary, Rumania, Bulgaria, and Albania, on which countries its interest is focused. It is not so rich in data, for example, as Nicholas Spulber's *The Economics of Communist Eastern Europe* (Wiley, New York, 1958). The major question it raises, however, is whether the purpose of this study, and of the series in which it is the first to appear, is analytical or pamphleteering. The task of an analytical study would be to determine how much of the expansion of Soviet and East-Central European trade (incidentally, the study does not use the words *expansion* or *increase* but always *trade drive* or *offensive*) makes no sense in economic terms, or has an economic cost and therefore can be regarded as political.

In the present instance, the National Planning Association's Special Project Committee starts out by asserting that "the recent policies of the Soviet bloc have been patently designed to secure influence and eventual domination over much of the uncommitted world" (page viii), and the author ends up by stating, "While the trade offensive of the East-Central European countries could perhaps be largely explained in economic terms, the aid drive undoubtedly rests on the political aspirations of the Soviet Union . . ." (page 113).

Many aspects of Soviet economic foreign policy, such as credits granted to underdeveloped countries and to the countries of East-Central Europe, are "patently" or "undoubtedly" uneconomic, just as United States aid to underdeveloped areas is "uneconomic" and could be described as penetration. But the expansion of foreign trade between the Soviet Union and Eastern Europe and between Eastern Europe and the countries of Asia must be described as economic, and not political, to the extent that it more closely follows the law of comparative advantage. The study does not directly pose the question of whether or not this is the case. The author asserts that trade is political; the reader is left with the uneasy feeling, however, that the facts indicate that the movement has been in the direction of more rather than less economic reason.

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## New Books

*Annual Volume of Physiology and Experimental Medical Sciences.* First issue, 1957–58. Dedicated to the memory of Prof. C. S. Sherrington on his hundredth birth anniversary. S. R. Mukherjee, Ed. Physiological Soc. and Soc. of Experimental Medical Sciences, Calcutta, India, 1959. 137 pp. Rs. 20.

*Covered Wagon Geologists.* Charles N. Gould. Univ. of Oklahoma Press, Norman, 1959. 295 pp. $4.

*Diagnostic Biochemistry.* Quantitative distributions of body constituents and their physiological interpretation. Halvor N. Christensen. Oxford Univ. Press, New York, 1959. 300 pp. $6.50.

*Earth Satellites.* Patrick Moore and Irving Geis. Norton, rev. ed., New York, 1959. 157 pp. $3.95.

*Électromyographie dans les maladies nerveuses et dans la cryptotétaine.* Atlas d'électromyographie. N. Rosselle. Nauwelaerts, Louvain, Belgium, 1958. 159 pp. F. 150.

*Elementary Astronomy.* Otto Struve, Beverly Lynds, Helen Pillans. Oxford Univ. Press, New York, 1959. 404 pp.

*Elements of Radio.* Abraham Marcus and William Marcus. Prentice-Hall, Englewood Cliffs, N.J., ed. 4, 1959. 683 pp. $7.

*Essentials of Chemistry.* Alfred Benjamin Garrett, Joseph Fredric Haskins, Harry Hall Sisler. Ginn, Boston, ed. 2, 1959. 614 pp. $7.

*The Evolution of North America.* Philip B. King. Princeton Univ. Press, Princeton, N.J., 1959. 207 pp. $7.50.

*Excavations at La Venta Tabasco, 1955.* Bureau of American Ethnology Bull. 170. Philip Drucker, Robert F. Heizer, Robert J. Squier. Smithsonian Institution, Washington, D.C., 1959 (order from Supt. of Documents, GPO, Washington 25). 320 pp.

*Experience in Radiological Protection.* vol. 23 of *Proceedings of the Second United Nations International Conference on the Peaceful Uses of Atomic Energy.* United Nations, Geneva, Switzerland, 1958. 462 pp. $14.50.

*Fallacies in Mathematics.* E. A. Maxwell. Cambridge Univ. Press, New York, 1959. 95 pp. $2.95.

*Le Fil d'ariane.* Variations sur deux thèmes: la fonction linéaire, la fonction exponentielle. A. Huisman. Wesmanel-Charlier, Paris, 1959. 212 pp.

*The Floors of the Oceans.* vol. I, *The North Atlantic.* Special Paper 65. Bruce C. Heezen, Marie Tharp, Maurice Ewing. Geological Soc. of America, New York, 1959. 122 pp.

*The Fourth Branch of Government.* Douglass Cater. Houghton Mifflin, Boston, Mass., 1959. 204 pp. $3.50.

*Glaucoma.* Transactions of the third conference. Frank W. Newell, Ed. Josiah Macy, Jr. Foundation, New York, 1959. 272 pp. $5.25.

*The Growth of Mathematical Ideas.* Grades K–12. Twenty-fourth yearbook. National Council of Teachers of Mathematics, Washington, D.C., 1959. 517 pp.

*The Individual and the Universe.* A. C. B. Lovell. Harper, New York, 1959. 121 pp. $3.