SCIENTIFIC BOOKS

NATIONAL UNITY AND DISUNITY

National Unity and Disunity. By GEORGE KINGSLEY ZIPF. xix + 408 pp. Bloomington, Ind. The Principia Press.

THIS is an interesting book. In it Dr. Zipf reports his discovery that in the United States and certain other nations at certain periods the population sizes of cities and towns form approximately a harmonic series, so that the rank of the city times its population size is a constant. This discovery may rank with Quetelet's discovery that the statures of men are distributed in accordance with the so-called normal probability curve. Dr. Zipf is greatly to be congratulated upon his perspicacity in making it.

He shows how the specialization of wealth and labor and the prevalence of exchange must produce an organization of the population into communities with some inverse relation between population-size and the number of communities, though this inverse relation could have many forms other than that of the harmonic series. Nobody, I judge, will dispute this. He argues that the distribution of communities to form a harmonic series must be related to and significant of something in the organization of a nation's life and work. Nobody should dispute this, though there will be many opinions about just what it signifies. He then argues that such a distribution to form a harmonic series signifies an "equilibrium" in a nation's affairs, and that such an equilibrium will tend to restore itself if it is disturbed by any force. "We shall find that any disturbance to the equilibrium of any social-economic system tends automatically to set forces in operation within that system to repel the source or to neutralize the effect of the disturbance in order to restore equilibrium" (p. 145). Though this doctrine will appeal to many sociologists, and to some biologists, it seems to the reviewer to be unwise, especially the second half of it. The valuable factual material relating the distribution of community sizes in various nations at various periods can, I think, be studied better without assuming any potency whatever in an "equilibrium" as such.

Dr. Zipf is led by his reflections on the harmonic series as a product of the social-economic organization of a nation to many comments of a more or less speculative nature on divers topics in history, sociology and government. I quote a few of them chosen almost at random:

"A nation may very well be a natural bio-social entity, quite comparable, in fact, to that of a colony of ants, or of bees, or of termites" (p. v).

"American paranoid tendencies may be felt to have reached their highest point in the last World War when the whole country, under an attack of mass-hysteria, crusaded 'to make the world safe for democracy' with all the delusions of grandeur, utopia, persecution and self-righteousness that are the stereotyped symptoms of this most vicious of mental diseases" (p. 79).

"As for the hope for a single world-wide all-inclusive homogeneous superstate with a single capital, the author finds no historical nor dynamic justification for it" (p. 182).

"Boundaries can be drawn" [in treaties or other agreements between nations] "in such a way that those living within the remaining boundaries and desirous of surviving can in fact survive only by reversing either (1) the physical laws of nature, or (2) the biological laws of nature, or (3) the psychological laws of nature" (p. 205).

"The author suspects that the cyclical business disturbances ('business cycles') of the past and present may conceivably be attributed in part to the alternation between an 'elite' and the 'entire nation' as the 'right number' for which the goods of society are produced" (p. 318).

"Indeed the turmoil of war and strife are perhaps to be viewed primarily as the correctives and 'cures' of maladjustments, rather than as their causes" (p. 404).

Opinions of experts in history, economics, government, psychology and sociology will vary widely concerning most of the dicta of which these are samples.

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TEMPERATURE

Temperature. Its Measurement and Control in Science and Industry. American Institute of Physics. xiii + 1362 pp. New York: Reinhold Publishing Corporation. $11.00. 1941.

IN 1919 the American Institute of Mining and Metallurgical Engineers sponsored a Symposium on Pyrometry under the chairmanship of the late George K. Burgess. The resulting volume of papers, now long out of print, became one of the standard source books on temperature measurement. The book under review is likewise the published record of a symposium, but of considerably greater scope than the 1919 undertaking. Instead of being confined to temperatures above 500° C, it covers the whole range from absolute zero to stellar temperatures, and from highly "theoretical," *i.e.*, logical, considerations on thermodynamics through to the most practical instructions on how to control a furnace temperature when one is compelled to.

As might have been expected, the resulting 126 papers by 160 authors differ greatly in length, in interest and particularly in pertinence. The contributions by the high- and low-temperature physicists stick closest to the theme of the book; they are the least readable, and will be found ultimately the most useful. The contributions by the biological group are the most

interesting, and tell the least about temperature measurement. The temptation to write at length about the results rather than the methods of some very ingenious thermometry was too much for the physiologists and some of the engineers, but they do lend a variety that the old Pyrometry Volume lacked. The amount of information released by the metallurgical industries is disappointing, for reasons easily understandable in a year when commercial and national rivalries were rapidly becoming intensified. The section on thermometric metals and alloys, however, is timely and informative. In the engineering group the contributions from the petroleum industry are the best. The wide range of the subjects may be indicated by citing papers on the thermometry of lamp filaments, volcanoes and liquid helium.

A particularly valuable part of the book is the section of 32 pages devoted to tables, containing the most authoritative data now available to the thermometrist and including some that have not previously been published in current technical literature. This section of the book, bound in covers, is separately purchasable for $1.00.

Although the National Research Council made a grant of funds and twelve of the leading technical societies took an active part, both officially and through individual members, in organizing the symposium, the most effective help came from the thermometrists of the National Bureau of Standards, as is fitting for a volume intended to be an expanded sequel to Dr. Burgess's classic text and his earlier symposium.

The reviewer considers this volume indispensable for any technical or scientific library worthy of the name.

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THE UNIVERSITY OF CHICAGO'S FIFTIETH ANNIVERSARY SYMPOSIA

A CORDIAL invitation is extended to scholars and scientists to attend a series of symposia and lectures in connection with the celebration of the fiftieth anniversary of the University of Chicago.

Nearly all the symposia and lectures will be held during the five days, September 22–26, inclusive. The American Association for the Advancement of Science will meet at the University of Chicago during this period, and the program in the sciences will be under the joint auspices of the university and the association. It should be noted, however, that the symposia on Astronomical Spectra (Yerkes Observatory, Williams Bay, Wisconsin, September 10–13), Respiratory Enzymes and the Biological Action of the Vitamins (September 15–17) and the Training of Biologists (September 18–20) will be held in advance of the meetings of the association.

More than one hundred visiting scientists and scholars, in addition to approximately fifty members of the university's faculties, will participate in the program, the general theme of which will be "New Frontiers in Education and Research."

In view of the limited capacity of the university's lecture halls, it is important that every one who desires to attend the symposia and lectures communicate as soon as possible with the Director of the Fiftieth Anniversary Celebration, the University of Chicago, and indicate the particular sessions in which he is interested. A copy of the announcement containing detailed information of the program and of housing accommodations for visitors will be sent on request.

The program of the symposia, in condensed form, is as follows:

September 13–15. Astronomical Spectra. At Yerkes Observatory. Participants: R. Wildt, R. C. Williams, W. W. Morgan, J. P. Kuiper, P. W. Merrill, T. Dunham, Jr., H. N. Russell, D. H. Menzel, M. Schwarzchild, P. Swings, A. B. Wyse, Otto Struve.

September 15–17. Respiratory Enzymes and the Biological Action of the Vitamins. Organized jointly by the University of Wisconsin and the University of Chicago, with sessions at Madison September 11–13. The program at Chicago will be devoted largely to the vitamins, and is supported by a grant from Abbott Laboratories. For the program of this symposium, address T. R. Hogness, University of Chicago.

September 18–20. The Training of Biologists. Under the chairmanship of P. A. Weiss. Fifteen members of the faculty of the University of Chicago and ten scientists from other institutions will participate in round-table discussions.

September 22. Growth and Differentiation in Plants. Charles E. Allen, University of Wisconsin; Edmund W. Sinnott, Yale University; John W. Mitchell, U. S. Department of Agriculture; John M. Beal, University of Chicago. Ezra J. Kraus, *chairman.*

Approaches to Linguistics. Edgar H. Sturtevant, Yale University; Amado Alonso, University of Buenos Aires; Clarence H. Faust and Charles W. Morris, University of Chicago. Clarence E. Parmenter, *chairman.*

The Editing of a Text. Edwin C. Armstrong, Princeton University; Gustave O. Arlt, University of California at Los Angeles; Rae Blanchard, Goucher College; William Roach, University of Pennsylvania; and Charles H. Beeson and James R. Hulbert, University of Chicago. William A. Nitze, *chairman.*

Organic Chemistry. William A. Noyes, Jr., University of Rochester; Louis P. Hammett, Columbia University;