ments at one extreme or emotions at the other, may be properly considered intellectual at all—these are problems for other, better informed studies, and, unfair though it may be to say so, since Feuer is certainly provocative and provoking, these will perhaps be studies written from a more conventional and more generally credible point of view than that of psychoanalysis *post mortem*.

They will almost certainly also be studies that will treat the circumstances of science relative to its content.

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## Crystal Lattice Defects

**Proceedings of the International Conference on Crystal Lattice Defects.** Supplements 1, 2, and 3 of the *Journal of the Physical Society of Japan*. Physical Society of Japan, Tokyo, 1963. Suppl. 1, 201 pp.; Suppl. 2, 360 pp.; Suppl. 3, 379 pp. Illus. Paper.

The international conference on crystal lattice defects was divided into two parts, topically and geographically. The first part met in Tokyo to discuss the mechanical aspects of defects, and its proceedings are contained in Supplement 1. Of the 34 papers presented in that supplement, about half describe theoretical and experimental studies of the motion of dislocations and their role in determining the strength and age hardening of metals and nonmetals. The remainder consider the point defects that normally accompany dislocations and their effect on internal-friction measurements, with special emphasis on the Bordoni peak.

The second part of the conference was held in Kyoto and concerned itself with more general aspects of defects, not directly related to studies of mechanical behavior. As an indication of the breadth of this conference, consider the 71 papers in Supplement 2. They can be loosely grouped in the following categories: electrons and phonons, their origins and interactions with each other and with other defects; thermal conductivity; point defects, their formation, migration, and contribution to conductivity and their observation by magnetic resonance and optical methods; color centers and luminescence; observation of lattice defects, mostly dislocations, by means of x-ray diffraction, field-ion microscopy, and other methods. The 72 papers in Supplement 3 are formally divided into two groups: (i) interactions between lattice defects, which contains 30 papers that are largely concerned with point defects and their role in various phenomena not already considered in Supplement 2, their interaction with dislocations, and a variety of topics ranging from crystal growth to dielectric relaxation measurements, and (ii) production and annealing of lattice defects, which contains 42 papers dealing with radiation damage in crystals, the defects produced and the methods for detecting these defects, as well as the phenomena that occur when damaged metals and nonmetals are annealed. As in other categories, various methods, materials, purposes, and end results are described.

The collected papers not only vary widely in content but also in the depth and breadth of coverage. Collectively, they accurately reflect our present knowledge of defects in crystals. Individually, they may or may not be sufficient to satisfy the reader's curiosity. If all the references cited are considered in evaluating this collection, however, then it can be recommended as worthwhile reading not only for the initiate but also for the neophyte. Even a casual examination is recommended, if only to illustrate the variety that exists in this field, less than three dozen years after its inception. The variety is particularly impressive when we realize that there exist other problems involving defects, problems that this conference did not consider.

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## Sigma Xi-RESA Lectures

**Science in Progress.** vol. 13. Wallace R. Brode, Ed. Yale University Press, New Haven, Conn., 1963. xiv + 305 pp. Illus. $7.50.

To the volumes of *Science in Progress*, the 12th of which was very recently reviewed in *Science* [**140**, 627 (1963)], may now be added the 13th volume. This collection of Sigma Xi-RESA lectures, again edited by Wallace R. Brode, contains the National Lectures delivered during 1961 and 1962.

A pleasant innovation is the inclusion of Alan Waterman's address at the annual convention of the RESA, on the occasion of his receiving the William Procter Prize for Scientific Achievement. Waterman's account of science in the 1960's deals not only with the present, but reaches back into history, and, more importantly, looks penetratingly into the future, where new breakthroughs are surely just around the corner. Erwin R. Biel outlines some important practical applications of new (and to many, surprising) discoveries in the fields of microclimatology and bioclimatology. Norman F. Ransey discusses molecular properties, formerly unobservable in dense gases or in liquids, but now ascertainable by the use of the molecular beam-magnetic resonance method. Sydney Chapman's beautifully illustrated and poetic chapter deals with the aurora borealis produced by the partnership of sunstorms and the magnetic field that emanates from the liquid core of the earth.

Theodosius Dobzhansky faces the dilemma that results from the continued occurrence of mutations with harmful effects, on the one hand, and medical and social progress, on the other, and discusses the present action of selection on man. Culture is deemed by far the most potent adaptive mechanism that has emerged in the evolution of life, and man's success as a biological species is attributed to the fact that his culture is able to change ever so much faster than his genes can. Future evolution will be attuned to our human values. Lloyd M. Beidler emphasizes the fact that all organisms live in a chemical world, and that the detection of chemicals is an important necessity in many animals. He outlines our present knowledge of taste and offers new biophysical approaches to the study of this important chemical sense.

Jesse L. Greenstein takes us on a telescopic journey through enormous reaches of space and time and discusses, in a most understandable way, the evolution of stars and the origin of the elements. Sanborn Brown introduces us to the newly appreciated state of matter—the plasma state—and acquaints us with its implications. Many scientific problems that arise from this recently acquired knowledge are outlined, including the very practical problem of controlling and harnessing the power of thermonuclear fusion.

Harrison Brown reminds us that the invention of agriculture, which oc-