with observations on subsequent *re*invasion. The only technique available in earlier years was physical removal with shovel, mattock, or axe. The procedure was a failure in that pieces of rhizomatous or root-suckering plants were invariably left in the soil, new seeds were planted, bare inorganic soil was exposed, and the plant community ceased to be the one originally under investigation.

Herbicides now afford a "tool" of extreme value in this field of research. Various formulations of 2,4-D (2,4-dichlorophenoxyacetic acid) and 2,4,5-T (2,4,5-trichlorophenoxyacetic acid) are available commercially. Most broad-leaved and coniferous plants are sensitive to them; grasses, ferns, and certain rhizomatous plants are resistant. With a knapsack sprayer equipped with a nozzle of low output, or using an oil-can, squirt gun, paintbrush, or one's fingers, a high degree of selectivity in application can be effected. Even with a knapsack sprayer one can basal-spray a tree or bush, and leave unharmed a plant 6 in. away. The chemicals are organic compounds that disintegrate in the soil in a matter of weeks or months, leaving no known residue. In the six years of application at Norfolk, no cumulative adverse effect has yet been noticed in the treated vegetation. In short, the selective application of selective herbicides allows one to pin-point out all individuals of most unwanted species, with apparently no ultimate physical or chemical changes in the soil, and with the rest of the plant community undisturbed.

Evidence now available from the author's study of vegetation development with the use of chemicals is sufficiently unprecedented to merit tests of this technique by others. For example, following local elimination of over 100 species of plants, reinvasion is resulting in a subsequent development totally different from that anticipated. Among the 70 kinds of woody plants eliminated, fewer than five give any evidence of staging a significant comeback even in the more open of the covers, and those five are returning in different proportions than they originally held. The significance of these phenomena for forest, range, wildlife, and other aspects of land management is worth critical consideration. They open up new vistas for research and development on the conversion to, and low-cost maintenance of, plant communities of all kinds, including those that are critical in the conservation of our natural resources.

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Book Reviews

Laboratory Design. National Research Council Report on Design, Construction and Equipment of Laboratories. H. S. Coleman, Ed. New York: Reinhold, 1951. 393 pp. $12.00.

If Stone Age man were to sit in judgment on our twentieth-century civilization, he might well be confounded by the seemingly endless operations involved in picking up the rock and hurling it at the charging beast—and, after the felling of the critter, by the long sequence of doings that delayed the meal. But, regarded in terms of result, this magic that is science would no doubt capture his imagination and command his attention.

There is no doubt about the wholesome respect for value that has directed the National Research Council and Mr. Coleman to so commendable an effort as publication of *Laboratory Design*—not to mention the research activity that forms the basis for the volume. Not only is there evidence of far-ranging and careful application to detail; there are clear signs of constant attempt at integration. In a field of endeavor that stretches so wide and deep, such fruitful means as the economical module of laboratory space and the standardized components of equipment are valuable contributions. These devices and yardsticks, born of the urgencies of science, attest to the concert of action and indicate a concern for end product. In this propitious climate, it would nevertheless seem appropriate for architect Roland Wank to warn, *as he does* in his introduction, against possible overconcurrence—and to speak for new approach when change and new discovery have reduced old systems to irrelevance. Perhaps, however, neither Mr. Wank nor the other contributors have placed enough stress on the role of the architect. Or perhaps there have been enough words; however, the majority of the buildings shown tell a story of arbitrary limitation. Meaningless bilateral symmetry, forced façade, insipid ornamentation, stand in the way of full realization. The factor of environment has been neglected. There has been but little brought forth that illustrates atmospheric quality of a space. There seems to be scant awareness of the need for the pleasant and the inspiring; little regard for the welfare of these humans who work for the general welfare. But these are the faults of the architects. They are the ones whom vision must lead to a deeper comprehension for this synthesis. This volume could have benefited from a more judicious selection of architecture.

Presentation is designed for easy reference—a refreshing change from the majority of factual publications. However, the book does not rise to the possibilities inherent in so colorful a realm. Where is there reflected the daring, the adventure, the beauty, of precise circumstance? Why should not typography, photograph, word, and drawing reveal the potencies and dignities of science? This failing seems to be part of a pattern of behavior that endures life in a medium-

gray, average, inanimate normality. Basically, nature is not that way, and scientists are the ones equipped to tell us so. Or is the higher evaluation the prerogative of the poet?

There would seem to be little doubt as to the immense value of this volume to all members of the laboratory team. It would appear to stand as a model, for other fields as well, in its systematic attack upon the common problem of fact-gathering and recommendation.

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Cybernetics: Circular Causal and Feedback Mechanisms in Biological and Social Systems. Transactions of the Seventh Conference, March 23–24, 1950, New York. Heinz von Foerster, Ed. New York: Josiah Macy, Jr. Foundation, 1951. 251 pp. $3.50.

This new volume has been edited by Heinz von Foerster, of the Department of Electrical Engineering, University of Illinois, with the assistance of Margaret Mead, of the American Museum of Natural History, and Hans Lukas Teuber, Department of Neurology, New York University College of Medicine. This diversity of professional interests of the editors is indicative of the variety of professions represented by the conference participants and guests. The program is represented as an experiment in an attempt to reintegrate science. In the words of Frank Fremont-Smith, medical director of the foundation,

> . . . between the disciplines there are real difficulties in communication—partly emotional and partly semantic. Emotionally some investigators accept only data derived from methods or disciplines with which they are familiar. On the semantic level the physical and biological sciences can understand each other without difficulty as can the medical, psychiatric, and social sciences. However, to bridge the gap between the physical and biological sciences on the one hand and the psychological and social sciences on the other is very difficult. Through the Conference Program this Foundation hopes to foster communication and reintegration and . . . give a clearer reproduction than now appears in the scientific literature of what takes place in the laboratory and what goes on in the minds of scientists.

This reviewer found it interesting, pleasant, and highly stimulating to be "present" at a discussion conference while relaxing in an easy chair. Since a considerable amount of information was brought out through discussion, in addition to that presented in the formal reports, a summary of the material would only tend to underestimate the contents. The specific topics considered at the meetings were: "Some of the Problems Concerning Digital Notions in the Central Nervous System," Ralph W. Gerard; "The Manner in which and Extent to which Speech Can Be Distorted and Remain Intelligible," J. C. R. Licklider; "The Redundancy of English," Claude E. Shannon; "Experience in Learning Primitive Languages Through the Use of Learning High Level Linguistic Abstractions," Margaret Mead; "On the Development of Word Meanings," Heinz Werner; "The Development of Language in Early Childhood," John Stroud; and "The Relationship of Symbolic Function in Language Formation and in Neurosis," Lawrence S. Kubie.

In spite of the participants' different viewpoints and training, the discussions maintained a high level of intelligibility and continuity. In closing the meeting Fremont-Smith stated,

> I do feel that . . . we have come closer to a discussion in which there is a common denominator for every discipline here.

For this very reason, the volume should be of interest to scientists, regardless of their specific fields. The Josiah Macy, Jr. Foundation should be congratulated for making possible the conference and the publication of this book.

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The Kidney: Medical and Surgical Diseases. Arthur C. Allen. New York: Grune & Stratton, 1951. 583 pp. $15.00.

More than half this "text and atlas of renal disease" consists of lucid, well-ordered plates, mostly photomicrographs. The legends are brief but clear and descriptive. There are useful sections on renal anatomy, embryology, and malformations.

The aim of the book is to help clinicians in visualizing the lesions that cripple their patients, and morphologists in reconstructing the dynamic evolution of the static lesions they finally see.

Unfortunately but inevitably, "life is short, art is long"—too long now for uniform excellence in every one of its aspects. Here and there the text contains pronouncements that could mislead a trusting clinician or student; related references give the impression of an uncritical selection. On the other hand, the coverage of renal pathology is in general satisfying, and some sections, notably those on toxins, infections, diabetes, and tumors, equal the high standard of the illustrations. Pathologists will take exception to the term "membranous" as applied to glomerular disease (it is accurate but has unrelated and well-established associations), to classification of benign albuminuria as a glomerular disease and myeloma kidney as a distal tubular nephrosis, and to a concept of hyaline droplet formation that runs counter to current weighty evidence.

The handsome volume is therefore recommended as a comprehensive atlas which should be in the hands of all who have to do with renal disease. But they should salt their use of its text by reference to other guides, such as Fishberg, Addis, Oliver, Bell, and Smith.

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