Their first task will be to capture a larger public than *Discovery* has ever had. If it had been a sound financial proposition, it would not have stopped now; it struggled all through its existence, and though in its new form it gained twice as many readers and four times as many subscribers, it was still a long way from paying for itself.

Now that means something: it means something, even if one thinks that good books should be published, irrespective of the money they make or lose. It means either that the public interested in the movement of science is actually rather small or else that it has not yet been properly provided for.

It is hard to believe that the public anxious to read the news of science is really quite small. Perhaps one exaggerates its potential size because of the zest and enthusiasm of so many of its members. It was one of the most pleasant experiences in editing *Discovery* to read letter after letter from readers, full of fresh, original interest. To them, science was something alive, part of the world's vital culture; it is difficult to believe that they form only a small fraction of intelligent people in the world to-day.

If they do not, then the others have not been reached. If that is so, a share of the responsibility rests on the editors who have tried to reach them. Where have we failed?

One gets a good many opinions. They are usually strong, because editing is a job upon which a surprising number of people hold unexpectedly violent views. The two most frequently represented to *Discovery* exactly contradict each other. The first is, that the general level of difficulty has been set much too low. One such critic suggested that all the articles ought to approximate to the standard of "Notes of the Month," *i.e.,* the journal should be made a medium by which professional scientists might keep in touch with fields other than their own. Some critics wanted the journal mainly given over to completely detailed articles suitable for students working for their degrees. And a sort of off-shoot of this view (with a pronounced tinge of dialectical materialism) required articles of that standard, but chosen in order to stress the relation between science and technology.

These critics may be right. But they would have to convince another band, which maintained with equal certainty that the level of difficulty was kept much too high and that the proper work of such a journal was to provide articles of the kind of our "Invitations to Knowledge."

It was our view that both these opposing schools of thought were much too doctrinaire, and that the journal could, and should, contain some articles to interest professional scientists, and others which could be read easily by a child at school. The journal, in fact, was popular among serious scientists, and we were proud of that popularity. Perhaps we leaned too much that way. At any rate, this can be said: If *Discovery* had continued, its general level would have become gradually easier rather than harder. That seemed, on balance, to fit it better for its proper purpose.

Its proper purpose would also have had to be limited. It has been called "a popular journal of knowledge"; regretfully we admit that that is asking too much for any journal in this heterogeneous world. Not many people are now interested in the world entire, and perhaps *Discovery* suffered through attempting to be too broad (although, of course, it was also criticized for being too narrow). If it had continued, we should have concentrated more on the fundamental sciences.

So, in short, our experience would have led us to make *Discovery* narrower in scope: simpler in manner (though finding writers who can simplify science truly is getting no easier).

All we hope now is that before long the same job will be tried again and carried farther.

The Editor of Discovery in the issue for March, 1940

SCIENTIFIC BOOKS

RECENT BOTANICAL BOOKS

Botany. By WILLIAM J. ROBBINS and HAROLD W. RICKETT. xii + 658 pp. 440 figs. Third edition. New York: D. Van Nostrand Company. 1939. $3.75.

IT is rather appropriate that Part I of this text should be entitled "The Living Plant," since, more than other somewhat similar books, this treatise emphasizes the physiological and hence the living aspects of plant life. Not departing very far from the traditional in its sequence of presentation, this volume is concerned first with the growth, structure, responses, reproduction and inheritance in the higher plants; in Part II the groups in the plant kingdom are considered in evolutionary sequence.

Both portions of the book do ample justice to the subject-matter. Forty pages and thirty-six figures are devoted, for example, to the structure and functions of stems. Other organs are treated with similar thoroughness. Likewise in the discussion of the plant groups there is attention to detail. In the angiosperms, for instance, we are introduced to sixteen different orders, starting with the Ranales.

In view of the large number of excellent texts in botany, the mere compilation and digestion of the general subject-matter of the science into book form can

hardly be considered any longer as an outstanding achievement. Each new edition or book should consequently be appraised, partly at least, on the basis of the presence of outstanding features. These are fortunately not lacking in "Robbins and Rickett."

It is consoling, for instance, to see that Dutrochet—"the forgotten man of the cell theory"—is given credit along with Schleiden and Schwann. Two pages are devoted to "tank culture," and together with specific directions there is the wise admonition that "there is considerable likelihood that inexperienced individuals attempting to raise plants in tanks will be disappointed." Vitamins, a special forte of the senior author, are ably discussed. The possible danger due to selenium of wheat coming from certain sections of the country and used as a food is pointed out.

Since the book is intended primarily "for general students as part of an education which all should have," rather than for the training of professional botanists, the inclusion of the more philosophical and striking aspects of the science is not only justified but desirable. There is, for example, a chapter on "The Nature of Life," in which vitalism and mechanism, the scientific conception of life and even the limitations of science are discussed in unimpassioned and wholly unbiased terms. In accordance with the more popular aspects of the book are statements such as the warning that our "energy-dissipating civilization" is leaning heavily on the "'bottled sunlight' of coal and petroleum" and can not continue to do so indefinitely. Similarly, there is also a full-page illustration of *Amorphophallus titanum*—the "largest known inflorescence." The illustrations as a whole are very adequate and mostly original.

This is a rather large volume, and the student is introduced, in separate chapters, to "The Origin of Life," "The Evolution of Life" and to "The Distribution of Plants on the Earth." In the chapter on evolution, the importance of geographical isolation, in the Hawaiian Islands, is happily stressed.

There are nine pages of references and thirty-six pages of questions for review and discussion with ample food for thought for those inclined to masticate.

Floral Morphology. By E. R. SAUNDERS. Vol. 2. xiv + 133–609 + vii pp. 7–48 figs. Cambridge: W. Heffer and Sons. 1939. 10s. 6d.

IN the companion volume (1), published two years ago, the thesis is presented and defended that the syncarpous gynoecium is made up of two kinds of carpels, sterile and fertile. Evidence for such "carpel polymorphism" was first suggested by a study of the *Cruciferae,* and it has since been applied by the author in an interpretaiton of the pistils of many other families.

It is pointed out in the introduction to Volume 2 that "the fundamental feature of the whole vascular scheme is the departure from the central axial cylinder of bundles corresponding in number and in their radial disposition with the number and arrangement of the floral members," although there may be modifications. The presence of three bundles in a flower part is said to be correlated with the branching of the midrib bundle and is not considered to be of particular significance.

The principles of flower interpretation here presented are then applied in the analysis of representatives of 190 families of angiosperms, of which 151 are to be found in Volume 2. One or more (often several) illustrative types are used for each family. While interest centers mostly in the carpels and their interpretation, much additional and valuable information on the flower characters of the families and of the selected types is also given, dealing with the external form, the internal architecture and with their interrelationships.

In the appendix, entitled "A Century's Challenge to Orthodoxy in Ten Chapters, with Preface and Epilogue," the author quotes the statements of numerous previous writers who accepted the view that some pistils, at least, are made up of two kinds of carpels.

Although there has been criticism of such wide application of the theory of carpel polymorphism, it is well worth while to have all this material brought together, in fairly concise form, for future discussion and study.

Basic Course in Botany. By RAYMOND J. POOL. v + 654 pp. 541 figs. Boston: Ginn and Company. 1940. $3.75.

THIS volume is organized on the general plan followed in the majority of our larger text-books. After two introductory chapters there is the treatment and discussion of the cell, tissues, and then of roots, stems, leaves, flowers, fruits and seeds. The material presented is more complete than that in most text-books—248 pages in all being devoted to these aspects of the plant.

The next part of the book deals with the groups in the plant kingdom—"The Nature of the Plant World." The algae and fungi are taken up in considerable detail. The angiosperms are also by no means neglected, since twenty-two families of the dicotyledons and eight of the monocotyledons are discussed at some length. In the presentation of the material on these higher flowering plants, considerable emphasis is fortunately placed upon the economic aspects. Over a hundred pages are devoted also to chapters on environment, vegetation regions, plant diseases, and variation, heredity and evolution.

Among the more unusual features of this text is the large number of diagrams illustrating the life cycles

of various members of the plant kingdom. These should facilitate the mastery of this aspect of the subject which is often a stumbling block to the neophyte. Many of the numerous illustrations are original, and a considerable number have been borrowed from the older authors, such as Hooke, Grew, Linnaeus, Sachs, Baillon, Kerner, Kny and others. It is surprising that so many of these older figures can be used to advantage in a new book on botany. Both the illustrations and numerous passages in the text emphasize the phases of the subject that are more striking or more general in their appeal, such as the occurrence of gigantic puffballs (one weighing sixty-one pounds) and the staggering figures on reproduction and size (or lack of it) in the bacteria.

"Basic Course in Botany" is no child's play. It is a copious assignment for a one-year introduction to the subject, especially for college freshmen, though no more so than many other similar treatises.

The author writes with a facile pen, and while a volume such as this can hardly be termed "easy reading," it is often rather pleasant. He finishes his task with the optimistic prophecy that "countless forms more interesting, useful, and beautiful than any that have yet appeared may readily grace those new scenes of nature's unending pageant of life."

Edible Wild Plants. By OLIVER PERRY MEDSGER. xv + 323 pp. Illustrated. New York: The Macmillan Company. 1939. $3.50.

As our civilization becomes more and more complex and specialized and in many ways more artificial, contact with the good earth and association with its humbler citizens seems to be less and less frequent. Even in the clan of broad-footed, leather-cheeked trampers, there is little real knowledge of the edibility or palatability of the great majority of our wild plants. Until the present volume appeared, it was exceedingly difficult to locate such information.

In "Edible Wild Plants" much information is assembled in orderly and usable fashion. Ninety pages, for example, are devoted to wild fruits which can be eaten, either raw or cooked—the sugarberry, for instance, eaten raw; barberry, used in preserves and jellies; the fruit of the may apple, edible when quite ripe, especially if it is consumed with discretion; the red currant, used in pies and jellies; the gooseberries, berries of the shadbush, eaten either raw or cooked; the creeping snowberry (*Chiogenes*), the partridge berry, the viburnums and a host of others. In addition there are discussions of edible nuts, from the Rocky Mountain nut pine to the acorns of some of the oaks, which must be properly treated, of edible seeds and seed pods, of salad plants and potherbs, including Irish moss, rock tripe—"an emergency food"—and the unfolding fronds of the bracken, which must be cooked. The young tender leaves even of the skunk cabbage, if deftly and properly handled, may be made "pleasing."

"Edible Roots and Tubers," such as the underground rootstocks of the arrowhead, *Sagittaria,* are considered, as are "Beverage and Flavoring Plants," like the black birch and sassafras, and "Sugars and Gums." There are numerous illustrations, and also "Finding Indices" of edible plants of various parts of the United States.

This volume is no mere tabulation; it is replete with intimate information on the characteristics and qualities of many of our wild plants, interestingly presented by an author who is obviously very familiar with them. It will be especially appreciated by those who wish to temper botanical knowledge with practical wisdom.

Poisonous Plants of the United States. By WALTER CONRAD MUENSCHER. xvii + 266 pp. 75 figs. New York: The Macmillan Company. 1939. $3.50.

No extensive treatise on the poisonous plants of the United States has appeared in recent years, and the volume under consideration aims to bring together the contributions of the more recent literature and incorporate them into the great body of factual material that has slowly accumulated over a long time.

In Part I certain general topics are taken up, such as the chemical nature and properties of the toxic principle in poisonous plants and its physiological action, as well as the conditions under which poisoning occurs. There are also brief general discussions—too brief, perhaps—of plants causing dermatitis, of plants like buckwheat that cause photosensitization in certain animals, of plants causing hydrocyanic acid poisoning, of plants like some of the species of *Astragalus, Oonopsis, Stanleya* and others which may become poisonous through the absorption of selenium from the soil, and finally of plants which cause mechanical injury.

The second portion of the book—comprising the great bulk of the volume—gives the poisonous plants of the United States, arranged according to families. About 400 species in sixty-eight families are considered, beginning with the ferns (*Polypodiaceae*) and ending with the *Compositae.* In many cases the species are taken up under the following headings: Description, Distribution and Habitat, Poisonous Principle, Conditions of Poisoning, Symptoms and Treatment. Most of the genera and many of the species are illustrated with clear line drawings.

This volume is a convenient compilation, in compact form, of a mass of material, much of which is of interest to the general botanist as well as to the layman. In assembling such data with reference to the more recent contributions, it fills a distinct hiatus.

EDWIN B. MATZKE

COLUMBIA UNIVERSITY