old view that "types" are the real thing in biology, whereas they are in fact only an abstraction (often imaginary) because reality resides in varying populations and gene-pools. As Mayr has so rightly stressed in his invaluable *Animal Species and Evolution* (Harvard University Press, 1963), "The replacement of typological thinking by population thinking is perhaps the greatest conceptual revolution that has taken place in biology." Not the least remarkable thing about Darwin's theories is the way in which their cogency has actually been reinforced by that revolution. After all, in the realm of thought, Darwin himself was one of the most powerful and certainly the kindliest revolutionary that the world has seen, and the fruits of his work still have not been fully appreciated.

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General Botany

Allgemeine Botanik. Kurzes Lehrbuch für Mediziner und Naturwissenschaftler. Wilhelm Nultsch. Thieme, Stuttgart, Germany, 1964. xii + 372 pp. Illus. DM. 9.80.

This short but comprehensive textbook of general botany approaches the plant through a consideration of its basic components. The first chapter is devoted to the molecular structure of the plant and its products. Within its 22 pages there are 66 chemical and structural formulas in addition to the numbered figures. This sets a pattern for the entire book, a pattern in which essential molecules, enzymes, metabolic pathways, and end products are graphically represented. Within the limitations of the book, considerable space is given to the chemical structure and significance of plant products of toxic and pharmacologic importance.

The next three chapters describe the physical, chemical, and morphological differentiation of protoplasm and the cell. The four electronmicrographs used to illustrate protoplasmic differentiation represent structures in *Euglena gracilis*. A systematic consideration of representatives of four phyla of the plant kingdom is covered in a short 25-page chapter, and this is followed by a chapter on plant organization, anatomy, growth habit, and differentiation. The structures and functions of leaf, root, and stem are presented in three chapters, which precede the 43-page discussion of the energy and chemical relationships involved in the essential activities of the autotrophic plant. A brief chapter is devoted to heterotrophy, including saprophytism, parasitism, symbiosis, and the adaptations of insectivorous plants.

Reproduction, the chromosomal basis of inheritance, the genetic code, phage and virus multiplication, and extrachromosomal inheritance receive proportionate attention. There is an important chapter on metabolic products, such as antibiotics and growth factors, and their influence on development. The final chapter deals with various tropisms exhibited by plants.

The book concludes with a listing of orders and representative families, a bibliography of ten items, and a 24-page index. The book fulfills its promise of a comprehensive textbook which presents its subject in present-day terms of modern technics and concepts.

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Polymer Chemistry

Macromolecular Synthesis. A periodic publication of methods for the preparation of macromolecules. vol. 1. C. G. Overberger, Ed. Wiley, New York, 1963. x + 81 pp. Illus. $4.75.

This excellent first volume of a new "syntheses" series, a series in the pattern set by *Organic Syntheses*, belongs on the book shelf of every practicing polymer chemist and in every science related library. The objectives endorsed by its editorial and advisory board are particularly noteworthy—"to provide trustworthy examples of polymer preparations for organic laboratory courses . . . [and to] provide help to industrial firms wishing to enter the field." It is proposed to include in future volumes of the series preparations of all types of monomers and polymers, including those of biochemical origin. Much credit for this volume must be given to Overberger who has submitted or checked 7 of the 19 preparations considered in the volume. Four of the 13 members of the editorial board and 1 of the 6 members of the advisory board have contributed or checked 9 of the 19 preparations. Obviously this represents great strength in reserve.

The preparations listed in volume 1 are illustrative mainly of recent novel developments in the field rather than of basic standard types. It is thus particularly timely and useful. There are preparations of five crystalline, isotactic, and syndiotactic vinyl polymers and preparations of one polycarbonate, one terephthalate, one cyclopolymer, two olefin copolymers, one polydisulfide, one 1-nylon, and two polycarbamates. Novel techniques are illustrated by an interfacial polymerization, a cyclopolymerization, an oxidative coupling polymerization, a catalytic air oxidative polymerization, and an aldehyde solvent polymerization.

Each preparation is described in terms of a preparative procedure (which has been checked independently and is therefore reliable), including data characterizing the polymer, notes, methods of preparation, and references. Unfortunately the last two sections are very incomplete with respect to most of the preparations. In the case of five preparations no references to the literature are given. The novice should not interpret this as indicating a lack of reliable reports that describe these processes or a lack of other valuable sources of information. The editor's acknowledgment to Sorenson and Campbell's *Preparative Methods of Polymer Chemistry* helps in part to alleviate this situation. In the same spirit, reference may be made to the two comprehensive volumes in the Houben-Weyl series, *Makromolekulare Stoffe*, volume 14, parts 1 and 2. It is hoped, however, that in future volumes the submitters will share their unusual knowledge of the literature through more detailed handling of this portion of their contribution.

The unusual demands for purity and for control of conditions placed on the experimenter in polymer chemistry makes this undertaking one of unique value. Every research scientist who is active in the field will have many occasions to be grateful to the editors and contributors for their devoted effort in helping to define these exacting and elusive specifications. Such devotion deserves the support of the community of polymer scientists, and I heartily endorse the appeal for submission of suitable preparations.

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