

ment, to recovery of uranium from low-grade ores, to recovery of gold and other metals from cyanide leach, and to processing various pharmaceutical products.

The article on "Peracetic Acid" is excellent. Not many years back, peracetic acid was just a dangerous substance; now, though still unstable when pure, it has become (in solvents or formed *in situ*) an important oxidizing agent for epoxidation of natural oils and their derivatives, and a number of other uses. An article on "Photovoltaic Solar Converters" describes the advances made in photovoltaic cells for the direct conversion of the energy of light to electrical energy, using silicon or cadmium sulphide; other substances, such as gallium arsenide, indium phosphide or cadmium telluride, should be effective.

Polymerization of pure isoprene in the presence of a lithium metal catalyst produces a polymer with structure substantially identical with that of natural rubber. This and other developments in artificial rubber production are presented in the article on "Rubber". "Sorbic acid", a fungistatic agent for foods, has an article to itself, in which methods of production and other uses are described. "Steroids with Corticoid Hormone Activity", describing the constitution and production of cortisone and derivatives, provides a valuable review and literature summary, including the cortexone derivative.

This Supplementary Volume contains articles of great current interest which illustrate the remarkable rate of progress of technology.

An encyclopædia is not only valuable for reference and for obtaining knowledge about some special subject, but, like a library, it is pleasant to browse within it, for browsing as well as study often leads to new ideas. This supplementary volume of "Kirk and Othmer" maintains the excellent standard of presentation of the main series of volumes and is an essential addition to the set. A. C. EGERTON

EMULSIONS

Emulsions

Theory and Practice. By Paul Becher. (American Chemical Society Monograph Series, No. 135.) Pp. ix+382. (New York: Reinhold Publishing Corporation; London: Chapman and Hall, Ltd., 1957.) 100s.

ONE of the most complex of the systems dealt with in colloid science is that of the emulsions. This is in no small measure due to the fact that they are essentially metastable and in disequilibrium. Dr. Becher quite rightly introduces the subject by giving a brief review of the properties of interfaces and the characteristics of surface activity. In this section the author covers a lot of ground; the discussions on solubilization and on micelle structures are particularly welcome, although the treatment of Gibbs's fundamental equation and its experimental verification might have been dealt with in greater detail, especially in its applicability to micelle-forming electrolytes.

The general physical properties of emulsions are next described before attempting to inquire into the theoretical basis for the apparent stability of such systems as well as the cause of phase inversion. These chapters are excellent in that they emphasize the importance of the interfacial phase in acting as a

barrier to the coalescence of liquid drops when brought in contact with one another. Not only must the electrostatic component of the repulsive forces which is approximately proportional to ζ^2 , where ζ is the electrokinetic potential, as well as the London, or van der Waals, forces, be considered, but also there is increasing evidence that in the aqueous phase at least the water in close proximity to the interphase has become more ice-like under the influence of the potential gradient existing there, and that the breaking of this ice-like layer in the act of coalescence is a factor that cannot be left out in any computation.

The author rightly points out that the phenomenon of coalescence is an important initial step in both phase inversion and in creaming, where the emulsion separates into two phases, one rich and one poor, in the disperse phase, and the views of Cockbain and of Schulman are clearly presented.

The next two chapters are devoted to a classification of the different types of emulsifying agents and to the various techniques which have been developed for the preparation of emulsions.

The variety of surface-active agents employed for emulsion formation is now extremely extensive. In general, the chemical constitution of such amphipathic substances effects a nice balance between the polar and non-polar portions of the molecule which may be positively, negatively or zero charged. Some discussion on this balance would not have been out of place in this section; for example, a consideration of the ratio of the number of ethylene oxide groups to methylene groups required for a good aliphatic non-ionic detergent. There are two appendices, one on testing and the other on commercial emulsifying agents.

This is a well-written book, concise in the American style, and the theoretical treatments, where developed, are integrated more closely in the corpus of the volume than is usual in such books. There are few obvious misprints. The format and printing are well up to the standard that we have come to expect of the American Chemical Society Monographs.

ERIC K. RIDEAL

CHEMISTRY OF PLANTS

The Chemistry of Plants

By Prof. Erston V. Miller. Pp. vii+174. (New York: Reinhold Publishing Corporation; London: Chapman and Hall, Ltd., 1957.) 38s. net.

THE principal function of a book on the chemistry of plants is to provide a source of information on the composition of plant tissues and the chemical properties of their major constituents. For the majority of readers, however, such a book would be made more interesting by some discussion of the metabolic relationships of these constituents. In his preface Prof. Miller makes it clear that he does not embrace this latter view and has specifically avoided encroaching on the domain of the plant physiologist.

In fact, the author has not been entirely successful in this and does offer a certain amount of biochemical information, but in quality and amount this is insufficient to redeem the failings of the book as a source of factual information. The author describes himself as "a mere compiler", but in this book he has rather been a collector of the compilations of others. All the tables, except one, are borrowed from