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PREFACE

Most scientific books represent at best an approximation of an ideal. Especially is this true of the "Encyclopedia of Chemistry"—the first attempt to combine the contributions of hundreds of authorities into a single integrated volume covering the enormous and heterogeneous field of chemistry. The ideal we have sought to achieve is a reference book par excellence, in which the vast range of subject matter is correctly weighted, usefully organized, and concisely presented by experts in such a way as to be at the same time scrupulously accurate and highly informative to anyone having a bowing acquaintance with chemistry. There are some who have said that this ideal is impractical—indeed that to compile such an encyclopedia is an impossible task. To what extent we have succeeded will not be determined by either the editors, the contributors, or the publishers, but by those whom the book is intended to serve—the multitude of chemists, physicists, engineers, biologists, research workers, teachers and students who comprise the scientific population of the world.

To capture between the covers of a single volume the sweeping scope and essence of any subject matter as complex and diversified as chemistry is a challenging task of the first magnitude. Now more than ever, analytical, inorganic, organic, physical, biological, engineering, electronic, metallurgical, colloid, and other branches of chemistry, because of sheer size and specialization, seem to go their separate ways in techniques, training methods, and literature, almost as though they were entirely different sciences. The student trying to prepare himself as a chemist in the broadest sense becomes increasingly confused and discouraged in attempting to move in so many directions without an integrating and unifying aid to guide him.

Perhaps, then, it is the primary function of a modern Encyclopedia of Chemistry, especially a single-volume one, to introduce a factor of convergence instead of divergence; focal condensation instead of scattering; unity instead of multiplicity; a centripetal instead of centrifugal process—in a word, *chemistry* instead of a multitude of qualifying terms. It has taken courage and faith to believe that this could be done and humbly to undertake the task of creating a reference work for which there has been, is, and will be such an obvious need on the part of chemists, scientists in general, teachers, librarians, and intelligent and inquiring laymen.

Such an Encyclopedia, if it is to accomplish its mission, cannot be merely a dusty compilation of definitions and data. Despite its necessary brevity of treatment, it must somehow communicate, in an irreducible minimum of words, the living, ever-changing habiliments of one of the greatest areas of organized knowledge. An Encyclopedia prepared by skilled authorities in so many fields can be not only informative but interesting and inspiring in both direct and intangible ways. It can have simultaneously the qualities of timeliness—a true and up-to-date representation of the chemistry of 1956—and time*less*ness, by which is meant a preparation so sound in terms of fundamentals that there will be no feeling of obsolescence when these articles are read in later years. Expansion, changes, new discoveries, corrections of errors and misconceptions there will inevitably be; but these should constitute merely superstructures on an established and enduring foundation.

These are some of the ideas and ideals upon which the planning, preparation and publication of this Encyclopedia have been founded. The old dream of Francis M. Turner has at last come to fruition.

Coordinated with the unifying and condensing concept is the fact that this is the com-

bined contribution of one of the most capable teams of chemists and allied scientists ever assembled to produce a single volume—great in number (over 500) and distinguished in reputation. The editors might well write a book on their experiences—almost all of them wonderfully pleasant and gratifying—in dealing with this select group. These authors believed from the beginning in the urgent need for a single-volume Encyclopedia of Chemistry; and the busier they were with other responsibilities, seemingly the greater was their interest and willingness to give generously of their knowledge, effort and time with no monetary compensation in order that this undertaking might succeed. Such selfless actions underlie true progress on all fronts of human endeavor.

Many of those who accepted the invitation to contribute felt that we were unreasonable in expecting them to discuss a complicated topic in the small amount of space available; yet there were few cases which required drastic shortening. Most of the articles are near miracles of condensation; and the book is so arranged that, by making use of the cross-references amply provided both within and at the end of the articles, the reader will be able to obtain a quite extensive coverage of any given subject. Inevitably there are omissions and deficiencies; but within the limitations of time set upon preparation so that all articles would remain fresh and most useful, the editors have striven mightily to reduce overlapping of subject matter and other defects to a minimum.

The topics selected for inclusion deal primarily with chemistry proper. However, "chemistry" means many things to many people. Realizing this, the editors have chosen to interpret the term quite broadly, and have included a number of subjects which, though not strictly chemical, either relate closely to the chemistry of materials and processes, or can be treated from a chemical point of view, e.g., Automatic Process Control, Annealing, Abrasion Resistance, Electron Tubes, and Instrumentation. Similarly, chemical engineering has been given appropriate attention; the more important unit operations and the basic theoretical considerations are presented under appropriate headings. Borderline subjects such as Air Pollution, Chemical Economics, Plant Location, and Market Research have also been included to round out the picture.

Besides these there are a number of articles which summarize the scope of other sciences which comprise a sort of "exurbia" of chemistry, such as Potentiometry, Meteorology, Metallurgy, and Bacteriology. These have been described as far as possible from the viewpoint of the chemist, and have been included to help integrate the entire concept of chemistry as it exists in the universe, as opposed to the laboratory, the classroom or the plant. Doubtless may others could justifiably have been added, but here too space limitations were a restraining influence. The same holds true of the brief biographies of outstanding figures in past chemical achievement, and of the information presented on research institutions. It is hoped that these will serve a useful purpose and that no glaring omissions have occurred.

Especially warm appreciation must be expressed to Mrs. Jean Pingry and her successor, Mrs. Margaret Kuo, secretaries at the University of Illinois, for their enthusiastic and faithful management of the very extensive files and correspondence involved in this project. Thanks are also extended to Mrs. Marilyn Nazimowitz for effective record-keeping and proof-checking in the office of the publisher. The editor-in-chief is deeply grateful to his colleagues at the University of Illinois, former students, friends and fellow chemists all over the country for their abiding interest and wise suggestions in helping to create something which might serve as a true panorama of all of chemistry. And without the continuing faith, encouragement and help of his wife through 37 years of literary and scientific effort his part in this project would have been far more difficult and less rewarding.

October, 1956

G. L. Clark
G. G. Hawley

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