differing opinions regarding this as an effective method of teaching, but it should arouse the curiosity of the better students.

This policy of omitting proofs is carried to an extreme in the last twenty-four pages of the book. This last chapter is entitled "Fundamental Concepts," and one is tempted to believe that the author has designed it to serve as a preliminary chapter to his "Modern Higher Algebra." An abstract group is defined, and then one comes up against the statement but not the proof of the simple theorem that the order of a subgroup of a finite group is a divisor of the order of the group. This policy is continued throughout the chapter. After the definition of ring comes the statement, "We leave to the reader the explicit formulation of the definitions of subring and equivalence of rings. They may be found in the first chapter of the 'Modern Higher Algebra.'"

This last chapter, then, is an encyclopedic treatment of groups, rings, abstract fields, integral domains, ideals and residue classes, quadratic fields and their integers and the Gaussian field. It is interesting to a mature reader, and under the administration of an expert algebraist should be a quick road to knowledge. A non-specialist who attempts this chapter with a keen class may be in for a few bad moments.

This book is a distinct contribution to the mounting list of books devoted to modern algebra. It is modern in its viewpoint and correct in execution, and the student who has mastered it is on the graduate-student side of the hurdle, ready to pursue further work in abstract algebra.

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PHARMACY

History of Pharmacy. A Guide and a Survey. By EDWARD KREMERS and GEORGE URDANG. x + 466 p., 30 figures. Philadelphia: J. B. Lippincott Co., c1940. $5.00.

THIS history falls into 4 parts. The first deals with primitive pharmacy in Babylon and Assyria, Egypt, Greece and Rome, among the Arabs, and in Europe in the Middle Ages. The second describes the rise of professional pharmacy in Italy, France, Germany and England, and outlines the interrelations of medical theory and materia medica, giving a detailed account of its development. The international relations based on professional and industrial foundations arising between these countries are also discussed.

The third part gives a comprehensive account of the growth of pharmacy in the U. S. A. in the colonial, Revolutionary and national periods tracing the dependency of American pharmacy upon that of the several European parent countries. The progress of pharmacy in the U. S. A. was marked by the growth of local, state and national societies, and the enactment of local, state and federal laws. Education began in private schools followed by state-supported schools usually attached to universities. The establishment of legal qualifications administered by state examining boards led to supplemental correspondence and coaching schools.

Pharmaceutical literature in America took shape, after various state organizations had planned an American pharmacopoeia to replace those of London, Edinburgh, Dublin and Paris, widely used in the U. S. A., in the Massachusetts Pharmacopoeia (1808), followed by that of the New York Hospital (1818) and that of the U. S. A. (1820). The seventh edition (1862) was the first to be issued under the direct auspices of the American Pharmaceutical Association. Legal status was granted it by the Pure Food and Drug Act (1906). The eleventh revision (twelfth edition) appeared in 1936. This series of editions is in itself a historical record of the scientific advances not only in pharmacy but also in some aspects of biochemistry, immunology, endocrinology, and especially in the history of the growth of knowledge and standardizations of the vitamins. The chapter on the establishment of a literature also contains a record of textbooks, works of reference and journals.

Part IV records the discoveries, inventions and contributions to science by pharmacists in the fields of chemistry and biochemistry and to the wider field of literature. Annotated bibliographies are provided for each chapter. The glossary is unusually extensive, including much historical material which is supplemented by an elaborate chronology of dates of pharmaceutical and general scientific interest.

This book is a mine of biological and biochemical information related to pharmacy, as well as a detailed and inclusive history of pharmacy.

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REPORTS

THIRTIETH ANNUAL REPORT OF THE BROOKLYN BOTANIC GARDEN

IN the Annual Report of the Brooklyn Botanic Garden for the year 1940, which the director, Dr. C. Stuart Gager, has submitted for the thirtieth time since his appointment, he records not only the activities of the year, but also briefly calls attention to the progress which the Botanic Garden has made since it was established thirty years ago. It is noted that this progress has continued, with minor fluctuations, notwithstanding

the fact that the annual budget of the Botanic Garden has fallen from nearly $229,000 in 1930 to $195,000 in 1940 ($168,000 in 1934). This falling off of income has, of course, resulted in curtailing many of the activities, in the temporary suspension of some of them, and in some loss of personnel.

The total general attendance at the garden for the first thirty years of its existence was nearly 22,500,000, or almost three times the population of Greater New York, as shown by the 1940 census, and more than eight times the population of Brooklyn by the same census. During this period nearly 18,000 teachers have brought to the garden more than 1,000,000 pupils for instruction in all aspects of plant life and horticulture by members of the garden staff. In addition to this, there has been an attendance of adults and children of more than 1,000,000 at classes organized independently of the schools. The garden has also during its first three decades given talks, lectures and addresses at schools to audiences totaling nearly 2,550,000.

The director points out that in order to carry on this educational program and to maintain a large collection of plants indoors and under glass, in proper condition of health and culture and properly labelled, requires the presence of a scientific, as well as an educational staff, and the inclusion of a certain amount of scientific research in such subjects as plant disease, plant breeding and other aspects of plant life. During these thirty years the city has made a total appropriation in its tax budget of a little more than $2,200,000, which is about twenty-eight cents per inhabitant, or a trifle less than one cent per inhabitant per year. Contributions of private funds by the Board of Trustees of the Brooklyn Institute of Arts and Sciences, of which the garden is a department, have been nearly $1,715,000.

When the development of the plantations of the garden began, in 1911, part of the area was a dumping ground where refuse was daily burned. The remainder of the fifty acres comprising the grounds was almost wholly undeveloped. By a happy combination of botanists, horticulturists and a landscape architect, the garden has now become one of the most beautiful spots in Greater New York and is generally recognized as one of the most beautiful and educationally effective botanic gardens in the world.

The annual reports that have been issued since 1911 have shown that the garden is by no means a parochial institution serving merely Brooklyn and New York City, but that its scientific and educational publications and its work of public education are known throughout the world. The report records the steady growth of the library, open free daily to the public, and of the herbarium, open daily for consultation for those competent to use such collections. Special attention is called to the cooperation of the Botanic Garden in scientific and educational work with such organizations and institutions as the New York World's Fair; Works Progress Administration; Department of Parks; Board of Higher Education; Board of Education; the American Association of Botanical Gardens, which the Brooklyn Botanic Garden helped to found; the Brooklyn Civic Council; the Garden Club of America; New York Bird and Tree Club; five hospitals of Brooklyn, and numerous other organizations.

The increasingly serious financial situation throughout the world has made it conspicuously difficult to finance the scientific and educational activities of the garden and to maintain the plantations and grounds in a proper state of upkeep. The director calls special attention to the need of additional endowment. By a special system of economy during the past twenty years, involving the expenditure of only a portion of the income from its permanent funds, the Botanic Garden has added more than $150,000 to its endowment. In order to maintain its present activities and to meet the constantly increasing demand of the public and of various departments of the City of New York for service, an addition of $1,000,000 to the endowment fund is urgently needed.

The report of the director is followed by reports of the heads of the various departments of the garden and a detailed report of the Botanic Garden Budget for the year 1940.

SPECIAL ARTICLES

THE PREVENTION BY CHOLINE OF LIVER CIRRHOSIS IN RATS ON HIGH FAT, LOW PROTEIN DIETS[1]

IN connection with experiments on the feeding of wheat germ oil, it was reported[2] that diffuse nodular cirrhosis of the liver was produced in 7 rats which received large amounts of the oil (3 to 5 cc per day) for 243 days or longer. This regimen was notably high in fat and low in protein. In subsequent investigations by Blumberg and Grady,[3] this observation on the dietary production of cirrhosis was repeated and extended with wheat germ oil and also with corn oil; a description of the pathology of the cirrhosis and of the extensive fatty changes was presented.

The production of cirrhosis of the liver in 3 dogs on high fat diets has been reported by Chaikoff and

[1] This investigation was aided by a grant from William R. Warner and Co., Inc., New York City.

[2] H. Blumberg, *Pub. Health Rep.*, 55: 534, 1940.

[3] H. Blumberg and H. G. Grady, *Proc. Am. Soc. Biol. Chem.*, April, 1941; also, in press.