MR. LEAVER and I would be the last to deny that today is a good era in which to live. We are having a wonderful time and, although we notice one or two imperfections in our society, we would certainly not take any bets that society would be better a thousand years hence. Far from believing in automatic progress, I think it is at least implied in our paper that we belong to the school of thought which feels that the natural course of development is toward dissolution and decay.

I am no expert on the history of invention, but it does seem clear to me, at least from reading the transactions of the Philosophical Society for a period covering the first half of the eighteenth century, that an immense amount of effort was wasted on the development of perpetual motion machines. Similarly, vast numbers of man-hours were wasted on the same project even after the possibility of attaining perpetual motion had been definitely disproved. This was done by those thousands of people (among them Mr. Rose) who had not yet got around to reading the literature on the subject.

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Book Reviews

Die Sonnenkorona: Beobachtungen der Korona 1939–1949, Vol. I. M. Waldmeier. Basel: Verlag Birkhäuser, 1951. 270 pp. Sw. fr. 24.60; cloth, Sw. fr. 28.60.

At present the investigation of the solar corona can be considered as the central problem of solar research. Since 1931, when B. Lyot succeeded in constructing a coronagraph, which permits regular observation and photography of the corona independent of the event of a solar eclipse, considerable advance has been made in the understanding of this phenomenon. This rapid progress is vividly illustrated by the fact that the present comprehensive treatment of corona physics could be undertaken just two decades later. The author, an authority in this field of research, is director of the Swiss Federal Observatory in Zurich. For decades the scientific program there has been devoted to solar research and, as a result of Waldmeier's efforts, the observatory has extended its activities to corona research. For this purpose, a special observatory has been established on a mountain near Arosa at an altitude of 6725 feet, and extensive research has been carried out since 1939. By means of spectroscopic investigations with a coronagraph, the intensities of two corona lines have been measured as a function of the position angle of the solar disk. The two corona lines employed are the green and red, with wavelengths of 5303 and 6374 A, respectively, attributed by Grotrian and Edlén to forbidden transitions in highly ionized states of the iron atom, namely, Fe XIV and Fe X.

The present volume contains a detailed description of the observatory in Arosa, the coronagraph, and the spectroscopic equipment. After a discussion of the research program and a description of the method employed, there are 1410 polar diagrams containing the spectrophotometric observations made with the green and red corona lines. The statistical evaluation of this extensive material will be given in a second volume, which will also contain results of further investigations. A third volume is planned to present a comprehensive treatment of our knowledge of corona physics. All scientists interested in this fascinating subject look forward with great expectation to the publication of these volumes.

It may be mentioned that at present five observatories are active in this type of research. Besides the original one of B. Lyot on the Pic du Midi in France, there are others in Austria, Germany, Switzerland, and the United States (at Climax, Colorado).

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Organic Chemistry (Holleman's). Rev. by J. P. Wibaut; trans. from 16th Dutch ed. by Samuel Coffey. Houston–Amsterdam: Elsevier, 1951. 660 pp. $9.00.

To one who some 25 years ago was nourished on Holleman's *Organic Chemistry,* this revision and modernization by Professor Wibaut is most welcome. It has always seemed a glaring omission that some qualified person had not undertaken a definitive revision of what was in its prime one of the classics of elementary organic chemistry textbooks. It was, therefore, with considerable anticipation that this reviewer began perusal of the latest edition of Holleman.

It must be admitted, however, that the reader's hopes were somewhat dampened. It developed that the thickness of the paper on which the book is printed had contributed strongly to the visions he had entertained regarding the comprehensiveness of the revised Holleman.

As stated in the preface, the book is intended not only for students who have chosen chemistry as their main subject, but also for students of medicine and biology. In the attainment of this aim Wibaut has succeeded admirably. The ultramodern organic chemist, who can find no basis for the subject other than in indiscriminate use of ionic conceptions, will undoubtedly find much to criticize in this edition. On the other hand, those who cling to the classical approach to the subject, tempered with a modest introduction of the newer concepts, will find much comfort in the presentation of the material. In the opinion of this reviewer, Wibaut has succeeded admirably in blending the old

and the new in such fashion as to provide an excellent basis for the student who desires some knowledge of organic chemistry—either as a subsidiary discipline or as a basis for further delving into its details.

Noteworthy are the discussions of recent advances in the chemistry of acetylenes, cyclo-octatetraene, the use of isotopes in elucidation of reaction mechanisms, and the introduction of modern ideas on biochemistry.

It is a pleasure to commend the present volume as an excellent introduction to organic chemistry without commitment that the book pretends to be more than its author sets forth in the preface.

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The Geography of Europe. 2nd ed. George D. Hubbard. New York: Appleton-Century-Crofts, 1952. 870 pp. $6.75.

Geographers and others interested in Europe will welcome the appearance of a revised edition of this well-known textbook. The author is professor emeritus of geology and geography from Oberlin College—a vigorous little man with a gray goatee, a twinkle in his eye, and a question on his lips, who looks for all the world like an elderly teacher from a centuries-old university in one of the countries he is describing. Professor Hubbard is a geographer of the old school who does not hesitate to employ a geologic term or refer to a geologic period when he feels it will improve his description or his interpretation. For such boldness this reviewer would like to commend him.

Approximately one sixth of the 800-odd pages in the book are devoted to aspects of Europe as a whole, and the remaining five sixths to a presentation of individual countries grouped for convenience on a broad basis of climatic similarity. Anthropogeography gets more than the customary attention, with a good chapter on the "Geography of Prehistoric Men in Europe," and a closing section entitled "Geography in the Fourth Dimension," which includes well-written chapters on agriculture, commerce, and culture.

The Geography of Europe is not a book to which one can turn for a completely up-to-date treatment of the European economy. Production figures and ratios have been reduced somewhat beyond the desirable minimum, but perhaps the author feels that such ephemeral facts can best be left to the annually revised statistical yearbooks. The book does provide, however, a good introduction to the broader physical and human patterns of the continent and can safely be recommended to both the student and the general reader. Most of the black-and-white maps are well selected, and a welcome addition to the revision is a colored political map with shaded relief, inside the front cover. More maps of the entire continent, showing, for instance, population distribution, agricultural regions, and coal basins, would certainly be desirable additions in a future revision. Many new pictures have been incorporated in the 1952 edition, and the bibliographies have been completely redone. As in the first edition, too many inconsequential books are cited and too little of the available periodical literature. The author makes passing mention of the *Géographie Universelle* series in his bibliographies but fails to credit De Martonne and Demangeon with authorship of the three final volumes on France. It seems doubtful that he has consulted much of the European literature on the continent he is describing.

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The Chemistry of Lignin. Friedrich Emil Brauns. New York: Academic Press, 1952. 808 pp. $14.50.

This monograph is a comprehensive treatise on the chemistry of lignin and should be considered a valuable addition to the library of the plant biochemist, the organic chemist interested in natural products, the plant physiologist, and others whose work or interests are associated with the chemical aspects of wood technology and utilization.

After a brief introduction to the nature and scope of the problems of lignin chemistry and the evolutionary development of research in the field, since its first recognition as a plant constituent, the author sets about to define lignin according to the present knowledge; to outline its distribution in the plant kingdom; and to discuss its morphological relationship to the plant tissue in which it occurs. Theories on the biosynthesis of lignin are reserved for discussion in a later chapter.

The chemistry of lignin is presented in an orderly progression from detailed discussion and evaluation of the methods for its isolation and determination to a broad but detailed outline of its physical properties and chemical reactions with organic and inorganic reagents—concluding with a consideration of the numerous theories on its chemical structure and relationship to other constituents of the plant cell wall. A brief account is given of attempts to synthesize lignin, and a short appendix of laboratory techniques is included.

Throughout the writing an intensive effort is apparent to establish a rational nomenclature for the multitude of lignin preparations and reaction products which appear in the literature, and to suggest methods of oriented approach to the great variety of problems which confront present and future workers in the field.

Literature citation is comprehensive although some readers may feel that significant papers have been excluded—a situation which the reviewer feels may be due to the extreme diversity of opinion and experimentation in the field. In general, the author has adhered to his stated intention of offering objective comment and interpretation where conflicting results are compared, and the book will serve as a much-needed blending medium to the vast and heterogeneous range of investigations to which lignin has been subjected.

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