

a chapter each on the practical application of Plant Hormones and Hydroponics in fruit growing.

The second edition, as a whole, is comprehensive and clearly written and, therefore,

to a practical grower its value is obvious. The student and research worker will also find in it much that is useful.

I. A. SAYED.

The Raman Effect

The Raman Effect and Its Chemical Applications. By James H. Hibben. (American Chemical Society, Monograph Series No. 80. New York: The Reinhold Publishing Corporation; London: Chapman and Hall, Ltd.), 1939. Pp. 544. Price \$11 or 66/-.

DURING the comparatively short period of a little over ten years that has elapsed since the discovery of the Raman effect, a vast amount of literature has grown around the subject. Over two thousand publications have appeared during this period and the subject has been pursued in the research laboratories of practically every nation in the world. A notable feature which characterises this vast literature is the diversity of topics which it covers. The fundamental nature of the discovery and the powerful weapon which its application provides for a study of several scientific problems has undoubtedly been responsible for such a state of affairs. A book writer in this subject is, therefore, confronted with peculiar difficulties. He is not only called upon to critically deal with an incredibly large mass of data but has also to present a comprehensive account of its several applications dealing with apparently very different branches of physical and chemical sciences, if his work is to do justice to the subject.

The book under review is written with special emphasis on the chemical applications by one who has himself done a considerable amount of work in that direction. It consists of three parts, namely, I. A General Discussion of the Raman Effect: Its Practice and its Theory; II. The Raman Spectra of Organic Compounds; and III. The Raman Spectra of Inorganic Compounds. A comprehensive bibliography and an elaborate index are given at the end.

An excellent account of the available experimental methods is given in Part I. The theoretical aspects of the subject with special reference to the normal vibrations of polyatomic molecules are also dealt with in an elementary manner in this Part. The mathematical detail has been skipped over in a number of places and rightly too as the

presentation of such detail would not only have been out of place but would also have unduly increased the size of the book. In the present form, Part I serves as a very useful introduction to a reader who wishes to make a detailed study of these aspects.

Consistent with the title of the book, three quarters of the matter is, however, contained under Parts II and III. In these Parts, the subject of molecular constitution is the dominating feature. Several other aspects such as isomerism of different kinds, free rotation, electrolysis, polymerization, etc., have been adequately dealt with in appropriate places. An alternative arrangement would have been to deal with these important phenomena under separate headings but, as the author himself says, there are certainly several different arrangements possible for the presentation of such a vast amount of material in the chemical field and it is not right to adhere too closely to any one method or criticise too strongly any other. A discussion of the Raman spectrum of benzene in relation to its constitution is contained in Part II. Amongst other notable sections in this part, mention may be made of the one dealing with terpenes and their derivatives. Part III, in particular, contains a full description of the Raman spectra of several simple substances such as some gases, phosphorus, sulphur, carbon, water, inorganic acids, etc., which forms the basis for a thorough understanding and appreciation of the various constitutional problems.

One great point about this book is the fact that it contains an up-to-date and exhaustive collection of experimental results so far obtained in the subject of Raman spectra and hence it is bound to be of immense help as a book of reference to all research workers in this subject. With the help of the bibliography and the index given at the end of the book, references to original papers are easily obtained by one who desires to get more detailed information on any of its particular aspects. As such, it fills up a long-felt void and will be welcome in many quarters.

S. BHAGAVANTAM.

CENTENARIES

Barlow, Edward (1639-1719)

EDWARD BARLOW, a British priest by profession but a mathematician and inventor by nature, was born at Warrington, Lancashire, in December 1639. He had his education at the English college at Lisbon and after being ordained priest, his chief employment was attending the poor "to whom he conformed himself both in dress and diet".

INVENTS REPEATING CLOCKS

Barlow invented repeating clocks in 1676 and repeating watches a few years later. On a string being pulled, clocks were made to indicate the hour or quarter which was last struck. But in a contest with another inventor, Quare, the King preferred to give the patent to the latter.

BARLOW'S VERSATILITY

Barlow had been described as a master of the Latin and Greek languages and as having had a competent knowledge of Hebrew. "Tho' he read not many books of that kind, the whole system of natural causes seemed to be lodged within him from his first use of reason. . . . At his first perusing of Euclid, that author was as easy to him as a newspaper."

HIS WORKS

Barlow was the author of :—

(1) *Meteorological essays concerning the origin of springs, generation of rain, and production of wind; with an essay on the tide*; 1715.

(2) *An exact survey of the tide: explicating its production and propagation, variety and anomaly, in all parts of the world, especially near the coasts of Great Britain and Ireland, etc.*; 1717.

(3) *A treatise on the Eucharist*. 3 v.

The second of these went through a posthumous second edition.

Barlow died in 1719.

Wigan, John (1696-1739)

JOHN WIGAN, a British physician, was born at Kensington, January 31, 1696. He had education successively at Westminster school and Christ Church College, Oxford. He became M.D. in 1727 and a fellow of the College of Physicians in 1732. Having been principal of New Inn Hall, Oxford, and secretary to the Chancellor of the University from 1726 to 1732, Wigan settled in London as physician to Westminster Hospital. He retained this office till 1738 when he went to Jamaica as physician and secretary to Sir Edward Trelawny.

HIS WORKS

As early as 1718 Wigan published a translation of a treatise on the cure of fevers from Longinus's *De Curandis Febris continuis Liber*. In 1723 he brought out a splendid folio edition of Aretaeus. He also edited the *Opera omnia medica* of Dr. Friend in 1733. He also wrote Friend's biography and translated his *History of physick*.

Wigan died in Jamaica, December 5, 1739.

Winchell, Newton Horace (1839-1914)

NEWTON HORACE WINCHELL, an American geologist, was born in Northeast, Dutchess Coutry, New York, December 17, 1839. Having had his early education in the local schools, he became a teacher at the age of sixteen. From 1855 to 1869 he was alternating between studying in the University of Michigan and teaching in schools. Thereafter having been an assistant in two state geological surveys, he finally settled down as the state geologist of Minnesota in 1872 and held the position till 1900 when the survey of the State was finished. From 1874 he also held the professorship of geology in the University of Minnesota. During the last eight years of his life he was in charge of the Department of Archæology of the Minnesota Historical Society.

HIS WORKS

As state geologist, Winchell published annual reports from 1872 to 1898. These reports, ranging from pamphlets to volumes of five hundred pages, taken along with the ten bulletins and six quarteos published as extra volumes, covered the geology of the State exhaustively. His *Aborigines of Minnesota* (1911) gave a similar exhaustive account of about 10,000 Indian mounds and constituted a regular encyclopædia of the anthropology of Red Indians.

POST-GLACIAL TIME

Winchell's many detailed observations and discoveries relating to the conditions of formation of the drift deposits and the sequence of events in the Ice Age were interpreted with a clearness and logic that have rendered them a substantial contribution to our knowledge of the glacial period. His description and discussion of *The drift deposits of the northwest* in 1873 contained a prophetic pronouncement, which was confirmed by actual field work some twenty years later. He estimated the duration of post-glacial time as lying between 7,000 and 8,000 years. This is regarded as his greatest service to glacial geology.

ANTIQUITY OF MAN IN AMERICA

Winchell's field examination and long deliberation led him to publish in 1902 a memoir of 16 pages establishing that man existed in America in the Ice Age. This subject continued to engage his attention throughout the rest of his life. In fact, his last paper entitled *Antiquity of man in America compared with Europe* was delivered as a lecture before the Iowa Academy of Sciences a week before his death.

GENERAL ACTIVITIES

Winchell was one of the founders of the Minnesota Academy of Sciences and of the Geological Society of America of which he became president in 1902. He was also the founder of the *American geologist*, the first geological periodical of America.

Winchell died at Minneapolis, May 2, 1914.

S. R. RANGANATHAN.

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