

E. C. C. Baly, F.R.S.; and "Is a True Monomolecular Action Possible?" by Prof. T. Martin Lowry, D.Sc. The following noted authorities took part in the discussion of these papers: Prof. F. A. Lindemann, Prof. Svante Arrhenius, Dr. Irving Langmuir, Dr. N. R. Dhar, Prof. J. Perrin and Prof. W. C. McC. Lewis.

The evening session was devoted to "Heterogeneous Reactions" and consisted of the following papers: "Chemical Reactions on Surfaces," by Dr. Irving Langmuir of the Research Laboratory of the General Electric Co., Schenectady, N. Y., and "The Mechanism of the Catalytic Action of Platinum," by the same author. In the discussion on this subject the following noted authorities took part: Dr. Eric Rideal, Prof. Wm. A. Bone, Dr. G. Ingle-Finch, Prof. E. C. C. Baly, Prof. W. C. McC. Lewis, Prof. Edwin Edser, Dr. E. F. Armstrong, Dr. T. P. Hilditch, Dr. H. F. Holtorp and Dr. Irving Langmuir.

A remarkable and historical meeting in which not only scientists of Great Britain but of three foreign countries took part; namely, Prof. Arrhenius of Sweden, Prof. Perrin of France, and Dr. Langmuir of the United States. Every one interested in this subject should not fail to read this book.

OTTO RAUBENHEIMER, PH.M.

Isotopes. By F. W. Aston, M.A., D.Sc., A.I.C., F.R.S., Fellow of Trinity College, Cambridge. Octavo, 152 pp., 21 figs., 4 plates. Cloth, \$3.00. Edward Arnold & Co., London, and Longmans, Green & Co., N. Y. City, 1922.

Toward the end of the last century the attitude of science in relation to the atomic theory started to undergo a complete and radical change. What had been before regarded as a convenient working hypothesis became with remarkable rapidity a definite statement of fact. The causes of this remarkable advance are to be ascribed in particular to the discovery of radioactivity.

Dalton in his Atomic Theory in 1803, the foundation of the modern chemistry, laid down five postulates, the validity of only one is in question, *i. e.*, "Atoms of the same element are similar to one another and equal in weight." The chemist who above all others urged the possibility of the heterogeneity of atoms was the late Sir William Crookes. His address to the Chemical Section of the British Association at Birmingham in 1886 should be read by all those interested in the history of scientific thought. The result obtained from the radioaction elements introduced a wealth of new

and revolutionary ideas. One of these was that elements might exist which were chemically identical but yet different in radioactive properties and even in atomic weight. In 1913, again in Birmingham, 27 years after Crookes made his prophetic remarks about atomic weights, papers were read in different sections of the British Association, one on the Radioelements and the Periodic Law, the other on the Homogeneity of Neon, both of which proved that substances could exist with identical, or practically identical, chemical and spectroscopic properties but different atomic weights. The need for a specific name for such substances soon became imperative and Soddy suggested the word "Isotopes" from the Greek "isos" equal, and "topos" place, because they occupied the same place in the periodic table of the elements.

The author has made wonderful researches in this new chemistry, which are laid down in the present monograph, which is well and abundantly illustrated with plates and figures. The book affords a ready means of becoming familiar with one of the most important developments in chemistry since the time of Dalton, namely, the subject of "Isotopes." Surely chemists and also pharmacists should be somewhat acquainted with this subject!

OTTO RAUBENHEIMER, PH.M.

THE SYNONYMY OF PEPPERMINT AND ITS PARENTS.

Conference Bulletin No. 2.

Since the first bulletin* was issued, additional material has been promised for these researches. Prof. Asahina of Tokyo University has secured authentic Japanese peppermint plants, for which the U. S. Dept. of Agriculture has granted an importation license. Mr. Norbert Miller, of Todd & Co., who recently visited Madison to discuss various phases of the research, has promised to supplement an earlier shipment by a much larger quantity of the first runnings of peppermint oil.

Dr. E. W. Washburn, of the National Research Council, was another recent visitor. We feel that a closer and more helpful relationship with the Council has been established.

At the Research Conference of October 13th, Mr. F. J. Bacon, who holds the A. M. Todd Fellowship, reported the preliminary results of his studies on the synonymy of peppermint and its parents.

* See page 1080, December 1922.

Mentha piperita (L. ex parte) Huds.,¹ or peppermint, is generally believed by most recent authors to be a hybrid plant resulting from a cross between *Mentha spicata* L. and *Mentha aquatica* L. It is supposedly sterile; fruits are rarely formed and then are not fully developed. The plants propagate by their rhizomes.

The types of *Mentha piperita* are classed in the following groups:²

Group I (sub-species *piperita* Briquet) resulting from

M. aquatica L. > × < *M. spicata* L.

M. aquatica L. × < *M. spicata* L.

(1) *M. piperita* var. *officinalis* Sole.

(a) *M. piperita* Huds. var. *officinalis* Sole forma *pallescens* Camus.³

(b) *M. piperita* Huds. var. *officinalis* Sole forma *rubescens*⁴ Camus.

(2) *M. piperita* Huds., var. *inarimensis* H. Braun.

(3) *M. piperita* Huds. var. *Durandoana* Briq.

(4) *M. piperita* Huds. var. *globosiceps* Briq.

Group II (sub-species *citrata* Briq.) resulting from

M. aquatica L. × < *M. spicata* L.

(1) *M. piperita* var. *citrata* Briq. the *Mentha citrata* of Ehrh.

Relative to the forms of peppermint listed, *Mentha piperita* (L. ex parte) Huds. (*M. piperita officinalis* Koch) has been divided into two varieties by Sole. A few of the common synonyms of the varieties by various authors are listed to illustrate the synonymy.

Var. 1. *Officinalis* Sole. *M. piperita* Smith; *M. officinalis* Hull; *M. piperita* Boreau; *M. viride-aquatica* F. Schultz; *M. Pimentum* Nees; *M. sylvestris* var. *piperita* Reichb.; *M. liabrata* Vahl.

Var. 2. *Vulgaris* Sole; *M. piperita* Hull; *M. piperita* Smith.

Index Kewensis lists seventeen species, by various authors as synonymous with *M. piperita* L.

The following synonyms for *Mentha spicata* and *M. aquatica* are given as follows:

¹ The name *Mentha piperita* Hudson seems to be most generally accepted by the older authorities on the mints. However, the name *Mentha piperita* Linnaeus is in use and appears to be the same plant.

² A. & E. G. Camus—Bulletin of Roure-Bertrand Fils, Oct. 1911, p. 3.

^{3,4} Corresponding to the white and black varieties cultivated in England.

Mentha spicata L. 1753; *M. viridis* L. 1763, Smith, Sole, Boreau, Wirtgen; *M. sylvestris glabra* Koch; *M. sylvestris* var. *viridis* Coss. & Germ.; *M. viridis* var. *macrostemma* Lejune; *M. viridis* var. *piperita* Opiz; *M. crispata* Schrader; *M. sylvestris* var. *crispata* Koch.

Index Kewensis lists twenty-eight species, by various authors, as synonymous with *M. spicata* L.

Mentha aquatica L.; *M. hirsuta* DC.; *M. rotundifolia palustris* Bauh.; *M. aromatica* Opiz; *M. capitata* Gilibert; *M. odorata* Sole.

Index Kewensis considers *M. citrata* Ehrh. synonymous with *M. aquatica* L. and lists ninety other species, by various authors, as synonymous with *M. aquatica* L.

In general, hybrid plants have characters intermediate between those of the two parents. But as they are not necessarily alike, variations are found which approach more closely to either one or the other parent. Thus the French varieties of peppermint are considered to show more resemblance to *M. spicata* L. whereas the English varieties resemble *M. aquatica* L.¹

The forms cultivated in America for the distillation of the oil are regarded by American authors² as *Mentha piperita* L., American Mint, and two varieties, *M. piperita* var. *vulgaris* Sole, black mint, and *M. piperita* var. *officinalis* Sole, white mint.

The above brief outline illustrates the complexity of the synonymy of the mint plant from a botanical standpoint. An effort is being made to secure the original descriptions of the older authors on the mints such as Briquet, Bentham, Sole, F. Schultz and others, for comparison and use in connection with our field studies.

POTASH IN THE GREENSANDS OF NEW JERSEY.

Bulletin 727 of the United States Geological Survey deals with the greensands of New Jersey as a source of potash. The section extends from Sandy Hook to Salem, and the width varies from less than a mile to fourteen miles. An estimate gives the possible yield of potash from these sources at 250 million tons.

¹ E. M. Holmes, *Perfumery and Essential Oil Record* 2, p. 11.

² Miss Alice Henkel, Dept. of Agric. Bull. No. 90, p. 5.