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## THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE PRELIMINARY ANNOUNCEMENT OF THE OTTAWA MEETING

Edited by DR. F. R. MOULTON  
PERMANENT SECRETARY

THE meeting to be held in Ottawa from June 27 to July 2, inclusive, will be the hundred and second meeting of the association and the fifth Canadian meeting. The first Canadian meeting was held in Montreal in 1857, only nine years after the organization of the association; the second Canadian meeting was held in Montreal in 1882; the third, in Toronto in 1899; and the fourth, also in Toronto, in 1921. The approaching meeting will be the first one to be held in Ottawa, the capital of Canada.

### OTTAWA

In 1613 Champlain and a few companions paused briefly on the promontory where Ottawa now stands to admire the broad sweep of the river against a background of the Laurentian Hills, which still remain tree-covered as they were three hundred years ago. For

two centuries the Ottawa River was the highway over which fur traders penetrated into the Upper Great Lakes and a considerable part of British America. The first white settler near the present site of Ottawa was Philemon Wright, of Massachusetts, who led a small company of pioneers to the region in 1800. In 1854 the name of the village which had grown up at the head of the Rideau Canal was changed from Bytown to Ottawa. In 1857 Ottawa was selected by Queen Victoria as the seat of the government of the provinces of Ontario and Quebec; in 1867 it became the capital of the Dominion of Canada.

At present the population of Ottawa is about 140,000. Being the capital city, it has magnificent public buildings superbly located on Parliament Hill. The Canadian Houses of Parliament are among the most graceful examples of Gothic architecture. A scenic

$$\frac{f_0}{f} = \frac{\rho^{2/3}}{\sqrt{1-\rho^2}} \log_e \frac{1 + \sqrt{1-\rho^2}}{\rho}$$

where  $\frac{f_0}{f}$  is the reciprocal of the dissymmetry constant and  $\rho$  corresponds to  $\frac{a}{b}$  of Kuhn's equation. Substituting the value  $1/35$  for  $\rho$ , we find a value of 0.396 for  $\frac{f_0}{f}$  or 2.52 for  $\frac{f}{f_0}$ . The molecular weight can be calculated by use of the equation<sup>9</sup>

$$\frac{f}{f_0} = \frac{M(1 - Vd)}{6\pi\eta N \left( \frac{3}{4} \frac{MV}{\pi N} \right)^{1/3}}$$

M is the molecular weight of the protein, V is the specific volume of the protein in solution, d is the density,  $S_{20}$  is the sedimentation constant at 20° C. taken to be  $174 \times 10^{-13}$ ,<sup>10</sup>  $\eta$  is the viscosity coefficient, and N is Avogadro's constant. A value of about  $42.5 \times 10^6$ , more than 2 times that suggested originally, is found for the molecular weight of the protein by this method. This would correspond to a particle 12.3 m $\mu$  in diameter and 430 m $\mu$  in length. This value of the molecular weight is reliable only to the extent to which the equation of Kuhn is applicable to the system under investigation and to which the assumption of no hydration is valid. This treatment of the subject emphasizes the necessity of knowledge of the shape and state of hydration of the tobacco mosaic virus protein in order to enable one to interpret accurately the data from the ultracentrifuge.

MAX A. LAUFFER

THE ROCKEFELLER INSTITUTE FOR  
MEDICAL RESEARCH,  
PRINCETON, N. J.

### THE PRESENCE OF RARE EARTHS IN HICKORY LEAVES

It has been established in the Bureau of Chemistry and Soils that the leaves of the hickory and sweetleaf may contain as much as 1.5 and 6.5 per cent. of crude  $Al_2O_3$ , respectively, in the air-dry leaf. The quantities present in the hickory vary from a few hundredths of 1 per cent. in neutral soils to the above quantities found in acid soils.

The abnormal behavior of the crude alumina precipitate obtained from the hickory leaves from a tree growing in a pegmatite vein of the Moorefield mine, Amelia, Va., led to the separation of a concentrate of the rare earth group of oxides amounting to 0.2 per cent. of the dry weight of the leaves. This figure is probably low, as there may have been some losses in the separations. The colors of the solutions, oxides and oxalates and behavior of the hydroxides indicated

a mixture of cerium, lanthanum, praseodymium and neodymium.

A spectroscopic examination was made at the National Bureau of Standards for the individual rare earths, which are extremely difficult to separate when present in small quantities. The presence and relative abundance of the rare earth elements are shown in the following table:

TABLE 1  
SPECTROSCOPIC EXAMINATION OF RARE EARTHS FROM  
HICKORY LEAVES\*

| Element      | Oxides from oxalate, several precipitations | Oxides from fluorides, through hydroxides |
|--------------|---------------------------------------------|-------------------------------------------|
| Cerium       | Very strong                                 | Strong                                    |
| Lanthanum    | Strong                                      | Weak                                      |
| Praseodymium | Strong                                      | Strong                                    |
| Neodymium    | Strong                                      | Strong                                    |
| Yttrium      | Strong                                      | Strong                                    |
| Samarium     | Moderate                                    | Moderate                                  |
| Europium     | Moderate                                    | Moderate                                  |
| Gadolinium   | Very weak                                   | Weak                                      |
| Dysprosium   | Very weak                                   | Weak                                      |
| Erbium       | Trace                                       | Very weak                                 |
| Ytterbium    | Trace                                       | Very weak                                 |

\* The strengths of the lines of the respective elements were compared using the following scale: Very strong, Strong, Moderate, Weak, Very weak, and Trace.

Scandium, terbium, holmium, thulium and lutecium were not found. Due to lack of information concerning the spectrum of illinium (61), a test was not made for this element.

The presence of "moderate" lines of europium, one of the rarest of the rare earths, is interesting and may point to a concentration of this element by the hickory leaves.

The rare earths are widely distributed and occur in the earth's crust in quantities smaller, but comparable to the quantities of phosphorus and manganese. They have been found in many soils in concentrations up to .05 per cent. The rare earths, lanthanum in particular, are comparatively strong bases. The fact that the rare earths resemble calcium, in forming insoluble oxalates and fluorides, is an indication that the rare earths may substitute for calcium in the growing plant, where that element is deficient. In some of their properties, however, the rare earths more nearly resemble aluminium, and in this case are absorbed by an aluminum-loving plant.

W. O. ROBINSON

RICHARD WHETSTONE

BUREAU OF CHEMISTRY AND SOILS

BOURDON F. SCRIBNER

BUREAU OF STANDARDS

### BOOKS RECEIVED

LEWIS, BERNARD and GUENTHER VON ELBE. *Combustion, Flames and Explosions of Gases*. Pp. xiii + 415. 79 figures. Cambridge University Press; Macmillan. \$5.50.

SHULL, A. FRANKLIN. *Heredity*. Third edition. Pp. xvii + 442. 168 figures. McGraw-Hill. \$3.50.

<sup>9</sup> T. Svedberg, *Chem. Rev.*, 14: 1, 1934.

<sup>10</sup> R. W. G. Wyckoff, *loc. cit.*

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