discoveries of science are reduced to their most cruel and malevolent application.

While we may not be able to specify the ways in which a League of Nations shall act to maintain peace, let us at least impress upon our government the essential importance of reaching the best possible understanding with other nations as a means of preventing future wars—in other words, the importance of forming the best attainable League of Nations for the maintenance of peace. We can not impress the government to this end in any way better than the truly democratic way of petitioning.

The precise form that a petition in favor of a League of Nations may take is of secondary importance, but it is of prime importance that the great body of public opinion which is so strongly in favor of permanent peace should make itself known to the government, and thus strengthen the purpose of those public servants who have this great end in view.

Let me note that six or more members of the National Academy, present at the Baltimore meeting, being officers in the Army and Navy, refrained from signing the following statement, because officers are not allowed to take part in such matters.

W. M. DAVIS

CAMBRIDGE, MASS.,
December 3, 1918

The undersigned members of the National Academy of Sciences, meeting in Baltimore, November 18, 1918, having petitioned the Congress of the United States to take action, in consultation with the governments of many other countries, toward the formation at as early a date as possible of a League of Nations for the maintenance of peace, hereby urge the members of other learned societies in the United States to do likewise.

CHARLES D. WALCOTT, Smithsonian Institution, Washington, D. C.

ARTHUR GORDON WEBSTER, Clark University, Worcester, Mass.

H. S. JENNINGS, Johns Hopkins University, Baltimore, Md.

DOUGLAS H. CAMPBELL, Stanford University, California.

VICTOR C. VAUGHAN, University of Michigan, Ann Arbor, Mich.

JOSEPH P. IDDINGS, U. S. Geological Survey, Washington, D. C.

WALDEMAR LINDGREN, Massachusetts Institute of Technology, Cambridge, Mass.

JOHN M. CLARKE, State Museum, Albany, N. Y.

WHITMAN CROSS, U. S. Geological Survey, Washington, D. C.

JOHN J. ABEL, Johns Hopkins University, Baltimore, Md.

W. M. DAVIS, Harvard University, Cambridge, Mass.

EDWIN G. CONKLIN, Princeton University, Princeton, N. J.

WALTER JONES, Johns Hopkins University, Baltimore, Md.

W. S. HALSTED, Johns Hopkins University, Baltimore, Md.

G. A. BLISS, University of Chicago, Chicago, Ill.

HENRY M. HOWE, National Research Council, Washington, D. C.

F. L. RANSOME, U. S. Geological Survey, Washington, D. C.

ERNEST F. NICHOLS, Yale University, New Haven, Conn.

W. H. HOWELL, Johns Hopkins University, Baltimore, Md.

EXPERIMENTAL OSMOSIS WITH A LIVING MEMBRANE[1]

IT was after an early killing frost some years ago that I cut down the dahlias before the sun could make effective its warmth of the early day. As the sickle passed through one of the large stems, water flowed out of the chamber between two nodes. A somewhat closer inspection revealed that fully half of the large chamber had been filled with water and that part of it had developed into long acicular crystals of ice. I was reminded of the advice given by an expert in dahlia culture, namely that, when the flowering period began, the plants should be given all the water they could stand. Ap-

[1] A personal communication to a former student.

parently, it was in these internodal chambers that the plants stored away what might be designated their reserve water supply. This observation has acquired new significance in the light of the statement made by Atkins that trees store away a supply of water as well as sugar in winter in the dead portions of the woody trunk and that these materials are drawn upon in the early spring for the new growth.

Interesting as this comparison may be in itself, the observation made on the dahlia, together with the peculiar stem structure of this plant, suggested the possible use of the internode with one of the nodes as an osmosis cell where the semipermeable membrane is a live tissue. Hence, I have been wanting to use it as such ever since, but failed to carry out the idea until this morning (October 3, 1918). Having cut down a stem, such a chamber or cell was easily prepared, a dilute salt solution introduced into the cell, the latter capped with a rubber stopper through which a tube was passed down into the cell, and the whole placed into a beaker with distilled water. It did not last long until the salt solution was seen to rise in the tube and at the end of possibly an hour it had risen fully six inches. Before another hour the salt solution had risen to the top of the tube.

A number of possibilities for further experimentation at once suggested themselves, but before going any farther, I thought it advisable to show the experiment to Professor Overton, our plant physiologist. He informed me that, so far as he knew, the experiment was a new one and asked for permission to show it to his class in place of the conventional thistle tube experiment. He called in two other members of the botany department who happened to be passing by. To them also the experiment was new.

Whether I shall be in a position to continue the line of investigation that suggests itself, especially during these times so hostile to research, I have my doubts. Nevertheless the mere possibility of studying osmotic problems, even greatly limited in range, with a living osmotic cell of such convenience as the dahlia internode and node, is stimulating in itself. It will involve not only chemical problems but a careful anatomical study of the tissues as well. Because of the great amount of reserve materials stored away in the roots, it ought to be an easy matter to raise this osmotic cell-producing plant in greenhouse for winter experimentation.

Edward Kremers
University of Wisconsin

QUOTATIONS

FRANCE'S SHARE IN BIOLOGY AND MEDICAL SCIENCE

A course of three lectures on France's share in the progress of science has been delivered at University College, London, by M. Henri L. Joly, professeur des sciences physiques et naturelles au Lycée Français. In the concluding lecture, on November 5, he dealt with biology and the medical sciences, but owing to the wide range of the subject, covering the achievements of at least three centuries, he professed that he could do little more than recite a list of names of greater or less distinction. After references to de Tournefort, Duhamel de Morceau, and Buffon, whom he regarded as a man of letters rather than an exact naturalist, he said that the founder of modern biology in France was Lamarck, who first sought in natural sciences for something beyond description and classification. Xavier Bichat was a pioneer in histology and did much valuable work on the cellular theory. Cuvier was declared to be the greatest of French comparative anatomists, and other naturalists mentioned were Gaudry, one of the early evolutionists; Van Tieghem, to whom very Frenchman studying botany acknowledged a debt; J. H. Fabre, who had done more than any man to popularize natural history in France; Armand Sabatier, the comparative anatomist, and Lecoq, who, the lecturer contended, had anticipated Mendel by twenty years. Turning to Frenchmen whose work had been more particularly in the sphere of medical sciences, after mentioning Mondeville and Guy de Chauliac, M. Joly passed on to the seventeenth century, noting the work of Pecquet on the thoracic duct, of Paris on