The legal research committee, headed by George Welwood Murray, sponsored studies in administrative law and legal history.

The fund continued to offer a group of fellowships for British graduate students at American universities, 31 having been appointed this year to spend two years in this country as guests of the fund. The distinguished physicist, William Lawrence Bragg, of the University of Manchester, has been elected to the British Committee of Award which selects these fellows, succeeding Sir Hector Hetherington, vice-chancellor of the University of Glasgow.

Appropriations were made for the training of psychiatrists and psychiatric social workers as a contribution to the progress of mental hygiene in the United States. The fund shared in the support of a central bureau of information about child guidance, under the auspices of the National Committee for Mental Hygiene, and of a study of psychiatric education. Gifts were made to the Welfare Council and to the Family Welfare Committee of New York City.

At the close of the fiscal year, September 30, 1936, the invested assets of the fund had a book value of $42,607,226.31 and a market value of $41,039,182.93. The directors of the fund are as follows: Edward S. Harkness, president; Malcolm P. Aldrich, Samuel H. Fisher, William M. Kingsley, Robert A. Lovett, George Welwood Murray and Dean Sage.

SPECIAL ARTICLES

A CRYSTALLINE VITAMIN A CONCENTRATE

THE non-saponifiable matter from the liver oil of *Stereolepis ishinagi*[1] was dissolved in a suitable solvent and fractionated by freezing at carbon dioxide snow temperatures. A final product, quite distinctly crystalline to the naked eye, was obtained. This material had the rather remarkable value of $E^{1\%}_{1\,cm} = 2{,}000$ (as determined by the Hilger Vitameter-A) while the blue value (determined by antimony trichloride reaction according to the method recommended by the British Pharmacopoeia) was 100,000. It is interesting to note that the ratio between these values is 1 to 50, which is in agreement with the ratio of the rather generally accepted provisional standard values for vitamin A, $E^{1\%}_{1\,cm} = 1{,}600$ and blue value = 80,000 (approx.).

The melting point of the pale yellow crystals was determined by evacuating at low temperatures to remove the last traces of solvent and then *very* gradually warming the cooled bath surrounding the melting point tube. To retard this rise in temperature the bath liquid was placed in a Dewar flask (transparent). The melting point ranged from 5.5° C. to 6° C., a rather satisfactory range since the resulting yellow liquid, or melt, is very viscous even at room temperatures. It is obvious that great accuracy in the determination of the melting point is difficult because of the high viscosity of the liquid.

After standing twenty-four hours with von Hubl's solution, the iodine number was 360, which corresponds to four double bonds; longer standing produced a slightly erratic increase in the iodine number. It is probable that addition to the double bond in the ionone ring is difficult.

Purely preliminary quantitative determinations of carbon and hydrogen in this product seem to indicate a carbon content of approximately 83.5 per cent. and a hydrogen content of approximately 10.5 per cent. (with remaining fraction ascribed to oxygen); these values will be corrected at an early date. Molecular weight determinations as well as biological tests are in progress and will be reported later.

HARRY N. HOLMES
RUTH E. CORBET

OBERLIN COLLEGE
DECEMBER 19, 1936

[1] Ishinagi liver oil furnished through the courtesy of the Mead Johnson Company.

STREAM DOUBLE REFRACTION OF PREPARATIONS OF CRYSTALLINE TOBACCO-MOSAIC PROTEIN

PREVIOUS experiments[1] have indicated that under certain conditions the concentration of tobacco mosaic virus in plant juice shows a high positive correlation with the intensity of stream double refraction produced by the juice. These results and others have indicated that the virus in plant juice may be composed of submicroscopic rod-shaped particles capable of causing stream double refraction.

Stanley[2] has obtained crystal preparations from infective juice which contain a high concentration of virus and has obtained considerable evidence that these crystals are the virus in a crystalline state. We have prepared crystals by means of Stanley's method and by a combination of certain steps in Vinson and Petre's[3] and Stanley's methods. Space does not permit giving the details of this combination method. For brevity the crystals prepared by Stanley's method will be called "Stanley crystals" and those prepared by the combination method "C crystals." It was found that the use of a Zeiss cardioid dark field condenser in

[1] W. N. Takahashi and T. E. Rawlins, SCIENCE, 81: 299–300, 1935.

[2] W. M. Stanley, *Phytopath.*, 26: 305–320, 1936.

[3] C. G. Vinson and A. W. Petre, *Bot. Gaz.*, 87: 14–38, 1929.