

eastern Canada. We have records of specimens from Labrador, eastern Quebec, Newfoundland, New Brunswick, Maine, New Hampshire, and Vermont.

NEW YORK BOTANICAL GARDEN.

DEMONSTRATION OF PROTOPLASMIC MOTION.

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Demonstration of protoplasmic motion is customary in classes in biology and elementary physiology. Satisfactory material however is not always to be found.

Living amoebae well show streaming motion of naked protoplasm but amoeba may not be available when desired. *Elodea* leaf-cells show evident rotation, large chloroplasts aiding the student to trace the motion. But active motion is often found in the middle of the leaf where underlying cell walls confuse the student as to the true course of the motion. Or, we may use *Trianea* root-hairs for protoplasmic circulation, but *Trianea* seems difficult to grow in city water. Staminal hairs of *Tradescantia* are of course available only when the plant blooms.

In our elementary classes we have found a dependable and satisfactory object for demonstration in the pollen tubes of *Vinca rosea* L. *V. rosea oculata* is equally useful. The plant grows readily from cuttings, requires no special conditions and only ordinary care which may be given in a small greenhouse. It is in bloom constantly; one is always sure of securing pollen. This pollen is germinated in a hanging drop of 10% sugar solution. Usually within two hours tubes long enough for study are formed; active streaming motion is readily seen within the thin pollen tube wall.

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NOTE ON FAGUS ANTIPOFII

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Having just acquired a copy of the work by H. Abich, Beiträge zur Paläontologie des Asiatischen Russlands (1858), I have been

interested in looking up the history of *Fagus antipofii*, which is first described and figured therein. The type came from the Tertiary of the Kirghis Steppe, north of the Aral Sea. Both Knowlton and Penhallow credit the species to Abich, but it is clear from the remarks at the end of the introduction and the credit given in the list of figures on the plates that the plant was described and named by Heer, and it should be so credited. In 1877, Heer figured a number of leaves from the Miocene of Sachalin, ascribing the species to himself. The figures show a plant apparently just like the original one, except fig. 7d on plate 2. This last has an undulate margin, and is suggestive of *Fagus undulata* Knowlton, which comes from the Fort Union of Yellowstone Park, and is presumably the species which Lesquereux had identified as *F. antipofii*. This *Fagus undulata* shows considerable resemblance to *Quercus grönlandica* figured by Heer from the Miocene of Spitzbergen, and the living Chinese *Q. aliena* Blume, but there is at present no proof that it is not a *Fagus*. Kryshtofovich in 1921 published an account of specimens ascribed to *F. antipofii* (writing it *antipovii* Heer) from the Tertiary of Posiet, on the coast of Siberia just above the Korean boundary. The figures show a narrower leaf, with the secondaries less crowded, and the margin distinctly undulate. Surely this is not *F. antipofii*, but more likely a new species. Schenk intimates that *F. pristina* of Saporta, from the south of France, is identical with *F. antipofii*, but later authors have treated it as distinct. In 1921 Kryshtofovich also recorded *F. antipofii* from Chang-gi in Korea, but I suppose it was the same as the Posiet plant. Heer recorded *F. antipofii* from the Kenai (Eocene) of Alaska, finding it similar to the Sachalin and Kirghis plant. Sir Wm. Dawson reported the species from the Oligocene of Quesnel river, British Columbia, but the identification should be confirmed. It is also said to occur in the rocks of Greenland and Japan.

As matters now stand, it appears probable that *F. antipofii* existed in America only in Alaska and perhaps Greenland. There is no really reliable United States record, so far as I can learn. It may be defined as a broad *Fagus*-like leaf with numerous (13-16) pairs of secondary nervures, and entire margins. That all leaves of this type belong to one species, or even to the genus *Fagus*, cannot be certainly known. Who would ever imagine

that the leaves of the Japanese *Acer carpinifolium* Sieb. & Zucc. which I saw growing in Kew Gardens, were those of a maple? I could hardly believe my eyes, but there were the maple fruits.

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BOOK REVIEWS

A TEXTBOOK OF GENERAL BOTANY FOR COLLEGES AND UNIVERSITIES*

This new textbook by Holman and Robbins is well planned and clearly written. It gives the student a general survey of the field and at the same time is not too comprehensive to serve as a general text for the first year of college botany. The book is divided into two parts. Part I deals with the higher plants, starting with the single cell and then taking up the different portions of the plant. Part II commences with the lower forms and works upward to the seed plants. It includes as well a chapter on heredity and evolution. This plan would seem to be the most logical way to attack the subject, since the higher plants are perhaps the first to attract the attention of the elementary student and at the same time they give an easy avenue of approach to the more lowly organized forms.

Each chapter has an outline of the contents at the beginning with reference to the pages where the subject is treated. This makes an excellent outline for study, showing the main divisions and the relation that the topics bear to one another. The book is well and fully illustrated and the drawings carefully labeled. Structure is discussed first, in order that the student may have a clear idea of the function, which is not left for a separate chapter, but the physiology of the organ is taken up immediately after its morphology. While morphology is so well and clearly dealt with physiology is not neglected, for there is a considerable amount of space devoted to the latter. This is a decided step in the right direction, since this side of the problem is very often overlooked, or rather poorly treated in an elementary course in botany. The authors have succeeded in giving us a well balanced

* Holman, Richard M. and Robbins, Wilfred W. A textbook of general botany for colleges and universities. 590 pages. John Wiley & Sons. New York. 1924. \$4.00.