naturalist in Funchal, who was handicapped at every turn by the lack of literature. He had purchased what he could, but at present prices were prohibitive. The Madeira Islands are extraordinarily interesting to the biologist, and every encouragement should be given to those who would study the fauna, flora or geology. Why should not we place a good series of American publications in the public library (Biblioteca Municipal) of Funchal, where they would be available to students? Anything sent there, care of the librarian, Sign. A. C. de Noronha, will be appreciated. There is, however, another very important way in which we can render assistance. That is by subscribing to European scientific journals, or joining scientific societies. In doing this, we enrich ourselves. The gallant way to which the scientific home fires have been kept burning in certain quarters would command our admiration if we knew the facts. Take for instance the *Annals and Magazine of Natural History*, the leading zoological journal of England. It appeared regularly all through the war, though the staff of the printing office (Taylor and Francis) was reduced to a minimum. It publishes zoological papers more promptly and accurately than any journal in America. Not long ago I presented a paper on fossil insects, with over 50 figures, and it appeared within a few months. I was not asked to pay for the cuts, as one often is in America, sometimes at fancy prices. The obvious comment would be, that the Annals must be a prosperous concern, quite unlike our poor American journals. On the contrary, I happen to know that it is losing heavily, but it carries on. There are many such cases, I do not doubt.

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SCIENTIFIC BOOKS

Sturtevant's Notes on Edible Plants. Edited by U. P. HEDRICK. Report of the New York Agricultural Experiment Station for the year 1919, II. Albany, J. B. Lyon Co., State Printers, 1919. 4to. Pp. i–vii, 1–686, with portrait.

A work of more than usual note has been made available to students of agricultural botany by the publication of a selected portion of the data on edible plants brought together by Dr. E. L. Sturtevant, first director of the New York Agricultural Experiment Station. Over six hundred quarto pages comprise the body of the volume, to which are added bibliography, index, biographical sketch of Dr. Sturtevant by Dr. Hedrick, editor's preface, Director W. H. Jordan's letter of transmittal, and a full-page portrait. The entries are arranged alphabetically under the Latin name of the plant to which reference is made. The first entry is here reproduced to give an idea of the manner in which the material is presented.

Aberia caffra Harv. & Sond. *Bixineae.* KAI APPLE. KAU APPLE. KEI APPLE.

South Africa. The fruits are of a golden-yellow color, about the size of a small apple. They are used by the natives for making a preserve and are so exceedingly acid when fresh that the Dutch settlers prepare them for their tables, as a pickle, without vinegar. Jackson, J. R., *Treas. Bot.* 2: 1255. 1876.

The closing citation is not attached to the paragraph as shown here, but is dropped to the bottom of the page, taking the form of a footnote. When mention of a synonym is required it follows the citation at the bottom of the page. Many of the entries are only of a few lines each, some of them range up to a page or two, while about two dozen entries occupy more space. About three pages each are given to Lima bean, English bean, pea, egg plant, cucumber, watermelon, kale, parsley, and wheat; four pages each to artichoke, carrot, onion, and radish; five pages each to banana, currant, cabbage, turnip, tomato and muskmelon; six pages each to beet, common or field bean, potato and pepper; eight pages to strawberry; and twelve pages to squash and pumpkin, and to corn. To secure the data, Dr. Sturtevant, who had a good reading acquaintance with Latin, Greek, French and German, and some knowledge of other languages, accumulated an extensive library, especially rich in pre-Linnaean works, and abounding in rare issues.

The underlying idea of the work is to supply data on the history of edible plants whether accounted of little or much value, and especially regarding their early uses in all parts of the world by primitive peoples and others, and to trace their introduction into cultivation, and their expansion into varieties as known at the present time. In these respects he has greatly added to the knowledge available in DeCandolle's "Origin of Cultivated Plants," Pickering's "Chronological History of Plants," and other standard works on the history of esculents.

The wealth of material brought together may to some extent be judged from the fact that DeCandolle's work, generally considered the best available on the history of cultivated plants, treats scarcely of 250 kinds, while the present work embraces nearly 3,000 kinds. The work is, moreover, only the choicest part of a vast storehouse of information secured by Dr. Sturtevant, which he would undoubtedly have elaborated into a still more extensive work, had it not been for his premature death. The extent of the research involved, a specially valuable portion being the knowledge obtained from rare and obscure writings, can be inferred from there being upwards of 6,000 citations, referring to some 500 publications.

But the work is not simply that of a bibliophagist and collector of data, for Dr. Sturtevant was a life-long student of constancy and variation in both plants and animals. As joint proprietor with his brothers of Waushakum Farm and Director of the New York Agricultural Experiment Station he possessed great opportunities for direct observations, which his keen and richly endowed mind combined with energy and initiative utilized to fullest degree. This practical knowledge has insured the omission of improbable travellers' tales and fanciful myths, and made the entries as scientifically historical and accurate as is possible.

Large credit must be given for preparing and issuing this volume to the broad-visioned director of the station at Geneva, Dr. W. H. Jordan, who authorized its preparation, and to the editor, Dr. U. P. Hedrick, who has shown in the arrangement of its contents a fine knowledge of the subject, rich scholarship and unflagging zeal. It was necessary for Dr. Hedrick to select the material from a vast amount of manuscripts, notes, and card catalogue items that had lain in the station library for twenty years, and to verify and complete the long list of citations. He has also supplied a very full and sympathetic account of Dr. Sturtevant's scientific career. The writer of this notice was associated with Dr. Sturtevant during the larger part of his directorship, and can therefore more fully realize the extent and value of the original material and of the labor expended upon it by the editor.

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SPECIAL ARTICLES

THE DISPLACEMENT METHOD FOR OBTAINING THE SOIL SOLUTION [1]

There have been several methods proposed for obtaining the soil solution. Among the most promising of the methods are those which depend upon the principle of the displacement of the soil solution by another liquid. Schloesing[2] was probably the first to use the displacement method, using water as the displacing liquid. Istcherekov[3] used ethyl alcohol as the displacing liquid and obtained results indicating that the true soil solution was secured. Morgan[4] has modified the displacement method, using a heavy oil as the displacing liquid and applying pressure to force the oil into the packed soil.

The present investigation was suggested by the work of Istcherekov, and the procedure followed was essentially the same as used by that investigator. Several displacing liquids were tried, including those miscible and non-miscible with water. The most satisfactory results were secured by use of ethyl alcohol.

The method consists of packing the moist

[1] Published with the permission of the Director of the Wisconsin Agricultural Experiment Station.

[2] *Compt. Rend. Acad Sci. Paris*, 63, 1007 (1866).

[3] *Jour. Exp. Landw.* (Russia), 8 (1907).

[4] Mich. Agr. Exp. Sta. Tech. Bul. 28 (1916).