trial Sugar Association" since its establishment in 1850. The first publication of this nature upon the "Origins of Beet Sugar Manufacture" was written by C. Scheibler in 1875; the second upon the "Development of the Beet Sugar Industry from 1850 to 1900 was written in 1900 by the author of the present memorial upon the "History of the Beet as a Cultural Plant." Professor Lippmann mentions in his preface that this new work is the ultimate result of an effort to bring the fragmentary sketch of the sugar beet, which he had prepared in 1890 for his well-known "History of Sugar," to a greater state of accuracy and completion.

As in his previous scientific, technical and historical writings, Professor Lippmann has condensed into this new treatise a vast amount of learning and research. He informs us that the earliest known reference to the beet is contained in an old Babylonian catalog of the plants that were cultivated in the gardens of King Merodachbaladan, who reigned from 722 to 711 B. C., in which record it appears under the name Silqa. This word, as well as the Syrian selka, and the Greek σικελός employed by Theophrastos, indicate Sicily as probably the place where the wild Beta maritima, which grows on the shores of the Mediterranean, was first cultivated. From the time of its early domestication in Sicily before 1000 B. C. the author traces the history of the beet first in ancient Greece, Italy and the other Mediterranean nations and then down through the successive centuries of the middle ages until 1809, when Achard published the results of his classical experiments (1786–1809) which placed the manufacture of beet sugar upon its earliest successful basis.

The perplexing question of the botanical origin of the beet is critically discussed in a special chapter. Owing to the fact that early writers frequently gave the name of beet to other root crops, such as turnips, radishes, parsnips, carrots, etc., the greatest confusion of nomenclature has prevailed and much caution must be exercised in interpreting the ancient records.

This new volume is another evidence of the many-sided ability of Professor Lippmann as chemist, technologist and author. It is a most interesting repository of botanical, agricultural and historical information. Curious bits of folk-lore, literary citations and entertaining episodes are interwoven with descriptions of the uses of the beet as a vegetable, a cattle food, a medicine and a crop for the manufacture of sugar. The copious footnote references to original sources of information as well as the excellent indices of authors, names and subject-matter make the book invaluable to those who wish to delve deeper into the subject.

The book is splendidly printed in clear Roman type and is very free from typographical errors, only one slight misprint (parenips for parsnips on p. 98) coming to the reviewer's attention. The single illustration in the volume is of particular historic interest, as it reproduces a drawing of the root, leaves and stalk of the beet contained in the Vienna manuscript of the "Materia Medica" of Dioscorides written about 500 A. D.

Professor Lippmann's new treatise is one which will appeal to all botanists, agriculturists and ecologists. It is also heartily recommended to every student of the history of science.

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SCIENTIFIC APPARATUS AND LABORATORY METHODS

MOUNTING AND EXHIBITING RELIEF MODELS

THE writer has recently completed a large relief model of the Bloomington, Indiana, Quadrangle. The model is mounted on a tripod of suitable height. The legs of the tripod are equipped with glides so that the model can be moved easily to any desired position on the floor. To the top of the tripod a large strap hinge is bolted and the model is securely bolted to the movable part of the hinge.

The model is so nearly balanced on the hinge that it can easily be tilted and securely fastened at any angle by means of a chain and hook on the back of the model frame. When not in use the model rests in a nearly vertical position, being supported by the hinge and resting against the legs of the tripod to which it can be fastened by hooks for additional security.

This method of mounting models that are too large to be easily moved by hand is especially convenient for class-room instruction since it makes an easily manageable model that can be viewed from any angle by members of the class. This free movement of the model would not be possible if it were fastened to a wall or immovably fixed on a frame.

The writer believes this method of mounting may be of interest to others who have occasion to mount or use illustrative material of this sort.

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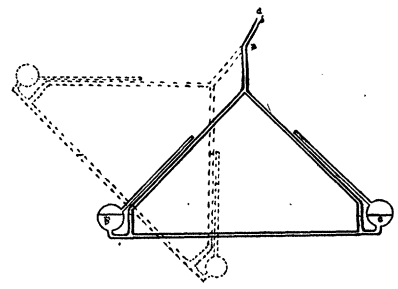
A DUPLEX VACUUM GAUGE

IT is evident from the sketch that readings are made by tipping the gauge through an angle of 45 degrees either side of the center line.

Connection to the system has been found satisfactory in most cases with high-grade vacuum tubing, but connection may also be made with a ground glass joint sealed with mercury.



The advantages of the gauge are that a minimum of mercury is required, less space is taken and perhaps most important there is no exposed surface of mercury.

RALPH C. HARTSOUGH

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SPECIAL ARTICLES

A ROT OF THE SMYRNA FIG IN CALIFORNIA

THE fig was introduced into California with a fair promise of being free from diseases which are so common on other fruits. The promise has faithfully been kept as far as the foliage is concerned, but the fruit is suffering from a number of diseases, the first of which has been early described by N. B. Pierce[1] as "a destructive fermentation of the fruit caused by a yeast," but no further work was done on the trouble.

While the writer, in the fall of 1922, was engaged in preliminary field survey for a study of this fermentation of figs, his attention was drawn by Miss E. H. Phillips, at that time investigating the black smut of figs caused by *Aspergillus niger,* to a particular rot of the fruit of the fig very often found in Calimyrna orchards.[2] The disease has since assumed alarming proportions. The writer has spent the greatest part of his time during the spring, summer and fall of 1923 and 1924 investigating this disease. A preliminary report is considered necessary by the interest aroused in phytopathological circles.

The disease, as far as it is at present known, affects only the fruit of the fig, and while it has been usually confused with souring, it is also known under the names soft rot, pink rot, brown rot, stem end or eye end rot. The symptoms of the disease are not always visible externally, as the disease progresses from the cavity of the fig outwards, the appearance of external symptoms depending on climatic factors and on foci of infection. The external symptoms consist in a more or less extensive watersoaking of the skin accompanied by a more or less bright pink or purple pigment. Such spots may occur principally around the eye or spread on the sides in indefinite areas. The meat and the pulp under such spots are entirely disintegrated, soft and watery, of a yellowish brown color and in many cases of a very offensive putrid odor. The disintegration of the pulp, however, may be found without any external signs whatsoever.

Rotten tissue examined under the microscope is found permeated by a hyaline, frequently branching, septate mycelium of a fungus which can be very easily isolated and which grows luxuriantly on a variety of culture media exhibiting extremely variable cultural characteristics. It fruits abundantly, producing catenulate, short or long, tapering or slightly curved, unicellular conidia on simple or branched conidiophores borne on the sides of the hyphae. The fungus has been tentatively identified as *Oospora verticillioides* Sacc.[3] Numerous inoculation tests have shown that this fungus is the cause of the disease.

A study of the distribution of this disease through the fig belt of California revealed the fact that the fungus is spread throughout the fig-growing sections of California, being found in both the San Joaquin and Sacramento valleys and in Southern California. It was also found that the disease is present only in fruit of the Calimyrna variety, or other caprified figs. The Calimyrna is the chief variety that requires caprification, and this has directed attention to the caprifying insect, *Blastophaga psenes* L. (*Blastophaga grossorum* Grav.). Plates poured from the pulp of the winter crop of Caprifigs (Mamme), showed the presence of the same fungus as well as a red or white bacterium which is also associated with the rot. This bacterium has been tentatively identified as *Bact. prodigiosus,* and while it undoubtedly contributes to the symptoms, it does not produce the disease when inoculated into figs.

An investigation of the flora of caprifigs and edible figs both green and ripe and their succession of crops was then undertaken and the results may be here summarized as follows:

[1] Pierce, N. B., "Investigations of the special agent in California." In Report Sec. Agr. U. S. D. A. 1892: 238. 1893.

[2] The Calimyrna variety is the Lob Indjir Variety of Smyrna grown in California.

[3] Cultures sent to Miss Nellie A. Brown, pathologist, Laboratory of Plant Pathology, U. S. D. A., Washington, D. C., were found producing septate, fusarium-like spores; the fungus has been identified by Dr. Sherbakoff as *Fusarium moniliforme* Sheld.