and the "Natürliche Pflanzenfamilien," although admittedly out of date in many particulars, are still most widely used as general authorities. The number of genera of seed-bearing plants according to the former is about 8,300; according to the latter, about 9,700. Nearly 8,000 names are common to these two works, thus constituting a substantial beginning toward a very widely acceptable list of generic names, that is, such as have been used for more than fifty years.

Seeking to follow the general suggestions received from other botanical institutions, the Brooklyn Botanic Garden is listing these 8,000 genera by families. Under each are added the names as to which there are nomenclatural or taxonomic differences. The usage or preference of a number of institutions as to families and the most frequently used genera are included. The whole will make a pamphlet of hardly forty pages: thus corrections can readily be made in the direction of the needed international list of genera.

It is expected that many disputed points as to nomenclature will be decided at the Cambridge congress in 1930. But taxonomic differences are many times more numerous than nomenclatural ones. How can taxonomic usage be made more nearly uniform?

We believe that scientific and practical requirements may be most nearly harmonized if a list of genera, with the strength of a recommendation, be added as an appendix to the International Rules of Nomenclature, somewhat as follows:

Article 20. Recommendation I*ter*. For botanic gardens, for horticultural purposes, for the international exchange of seeds and for other practical uses, a complete list of families and genera of vascular plants is provided, as of 1931. Nomenclatural matters of this list are decided by the International Committee of Nomenclature. Taxonomic matters are decided by a group of institutions designated by the congress. Revised lists will appear at intervals until 1940, and thereafter every ten years. This list is not intended to interfere with the nomenclature of taxonomic research publications.

Alfred Gundersen

Brooklyn Botanic Garden

GREGOR MENDEL

Gregor Mendel was born in Neu-Titschein, Czecho-Slovakia. Certain men of science in Czecho-Slovakia, particularly in his native province, are seeking to establish a monument to him. The total amount needed is $3,000 and of this half has been raised. The committee hopes that geneticists in the United States and philanthropists who may be interested thus to participate in honoring Mendel would contribute about $1,000 to the deficit. The treasurer of the fund is Franz H. Nitsch, official director of the Neu-Titschein Savings Bank. Funds may be sent to him directly or, if preferred, to the undersigned, who has been asked to collect funds in the United States.

It has seemed unnecessary to add anything concerning the great, well known and deeply appreciated part that Mendel has played in the advancement of biological science.

Chas. B. Davenport

The Station for Experimental Evolution of the Carnegie Institution, Cold Spring Harbor, L. I.

SCIENTIFIC APPARATUS AND LABORATORY METHODS

ANOTHER SYNTHETIC RESIN USEFUL IN MICROSCOPY

An account was published in Science[1] in 1927 in which was given some of the properties of a synthetic resin which appeared to be useful in certain classes of microscopic mounting. This substance was derived from aniline and possessed a strong yellow color. The only suitable solvent known was aniline, and because of the comparatively high temperature required to evaporate the liquid in a reasonable time the resin appears to be unsuited to much work in biology, although these properties in no way detract from its usefulness in the mounting of fossil diatoms for which it was originally made and recommended. This resin was listed as A. F. S. in my protracted series of experiments on mounting media.

It now seems fitting to announce another synthetic product having very different properties. This is a derivative of the simple hydrocarbon, naphthalene; it is soluble in xylol, benzol, toluol, and many other organic solvents, but not in water or alcohol. No color can be detected in slides mounted with this material, and in large bulk it has but a faint straw color—less than in the same quantity of Canada balsam. The resin has been noted as *hyrax*.

Test slides made with this resin have not changed in color or other characters in eighteen months' exposure, and nothing has appeared to indicate that they are not permanent. The material stands an exceedingly high temperature without decomposing or discoloring, and the ordinary oven treatment to which balsam mounts are subjected quickly removes the solvent because of the absence of difficultly volatile substances such as the turpenes in balsam.

[1] Hanna, Science, 65, 1927, No. 1672, pp. 41–42; No. 1693, pp. 575–576.

By far the most valuable property of the resin from the standpoint of the critical microscopist is the very high refractive index. When dried on the slide this is between 1.70 and 1.80, a figure far higher than balsam, styrax or other common mounting media. Since fine structure becomes more and more visible the higher the refractive index of the material in which the object is mounted it is obvious that hyrax will show details that are completely invisible in a balsam mount. This property makes the resin particularly valuable in the study of diatoms. In this respect it is almost equal to A. F. S., while its pleasant odor, lack of color and other desirable properties make it more satisfactory for general use. There does not appear to be any chemical reaction with such common stains as have been tested; no fading has been detected thus far.

These experiments are being continued, and while hyrax may not be the best synthetic resin which will eventually be developed it certainly is the most valuable for certain classes of work which has thus far been found. The early batches of the material possessed a definite straw color but by careful chemical manipulation Messrs. L. A. Penn and Paul Ruedrich, who are associated with me in the experiments, have succeeded in producing it practically without color.

G. DALLAS HANNA
CALIFORNIA ACADEMY OF SCIENCES

SPECIAL ARTICLES

ON THE RELATION OF POTASSIUM TO IRON IN THE COMBUSTION OF CIGAR-LEAF TOBACCO[1]

IT has long been recognized that potassium may act as a catalyst in the combustion of cigar-leaf tobacco, and that its efficiency in this respect is largely determined by the form in which it is found in the leaf. These points have never been questioned seriously, but opinions have differed concerning the exact mechanism involved in this form of catalysis.

In our studies on the burning qualities of Pennsylvania cigar-leaf tobacco, we have substantiated the claims of others, namely, that ready combustion is usually, but not always, associated with potassium in organic rather than in inorganic forms of combination. Moreover, we found that if the ash of a cigar was rubbed into the surface of an ash-free cellulose filter-paper, the latter could be made to burn with a glow, instead of a flame, and that the ash from a good burning cigar was more efficient in this respect than the ash from a cigar of inferior burning qualities. This suggested a modification of Garner's method[2] for a study of the effect of individual ash constituents on the combustion of organic materials, apart from those of the cigar-leaf, inasmuch as both insoluble and soluble ash constituents could be used advantageously.

As a result of these experiments it was found that a number of ash constituents and many of the organic compounds of the leaf imparted glowing qualities to the filter-paper. Of these, however, potassium carbonate appeared to be more efficient than any of the compounds studied, although its use usually resulted in the production of a dark ash. It is our opinion that the catalytic action of potassium carbonate on the burning of filter-paper is due to the fact that the potassium ion forms auto-oxidizable compounds with cellulose derivatives, and that the carbonate itself aids in the dispersion of carbon particles, thus increasing the total surface for combustion. That moisture must play a part in the dispersion of carbon was indicated by the fact that a dry mixture of carbon and potassium carbonate did not burn more readily than carbon when used alone. We conclude, therefore, that what holds true for pure cellulose holds true also for leaf tissue. In the latter, however, a greater dispersion of other materials present may likewise take place, materials which may have a catalytic action as well. Among these may be mentioned iron oxides. The presence of a mere trace of these compounds aids in the combustion of dry carbon.

Potassium carbonate, mixed with iron oxides which were obtained by the combustion of organic iron salts, when applied to filter-paper, was found to have a more beneficial effect on the glowing capacity and thoroughness of combustion than when either material was used alone. This observation led us to anticipate a rather close relationship from the standpoint of combustion between potassium and iron as they occur within the leaf. Tests on fermented samples of tobacco failed to show the presence of either the ferric or ferrous iron. A test showing the presence of complex ions of iron, on the other hand, was readily obtained. We have reason to assume, therefore, that the iron must be present in combination with salts of hydroxy acids or related compounds, which normally occur in the leaf. Experiments on the effect of these complex salts on the combustion of filter-paper showed that potassium-iron-citrate, for example,

[1] Published by permission of the director of the Pennsylvania Agricultural Experiment Station as Technical Paper No. 474.

This investigation was conducted in cooperation with Dr. W. W. Garner, of the U. S. Department of Agriculture, Bureau of Plant Industry, Office of Tobacco and Plant Nutrition, and Professor F. D. Gardner, of the department of agronomy of the Pennsylvania State College.

[2] U. S. D. A. Bur. Plant Ind. Bul. 105.