lowing promotions have been made: Dr. C. B. Bazzoni to be professor of physics, Dr. George Gailey Chambers and Dr. Howard Hawks Mitchell to be professors of mathematics and Dr. Karl Greenwood Miller to be assistant professor of psychology.

DISCUSSION AND CORRESPONDENCE

THE GEOGRAPHICAL DISTRIBUTION OF HYBRIDS

It is often assumed by systematic botanists in this country that natural hybrids between species can only exist within the common range of the parent species. This opinion has been emphasized in a caustic criticism of Brainerd and Peitersen's recent article entitled "Blackberries of New England—their classification."[1] In the article cited,[2] the following expression appears:

> . . . no one, not specially forewarned or gifted with remarkable intuition, finding *Rubus frondisentis* (*"R. pergratus* × *setosus"*) superabundant in Coos County, New Hampshire, *R. glandicaulis* (*"R. allegheniensis* × *sentosus"*) in the thickets of Prince Edward Island, where *R. setosus* is unknown, or *R. arenicola* (*"R. Baileyanus* × *frondosus"*) dominant on dry barrens of Nova Scotia where *R. Baileyanus* is unknown and where *R. frondosus* is represented only by *R. recurvans,* can guess in which key to trace his species.

A number of similar quotations might be cited from the same source all involving the negation of the possibility of the occurrence of a hybrid beyond the range of the parent species.

It would seem reasonable to appeal to the better known floras of Europe in a case of this kind, and no one can perhaps be quoted with more effect on this important subject than Anton Kerner von Marilaun. In the second volume of his classic "Pflanzenleben," as well as in the "Osterreichische botanische Zeitschrift" (Vol. 21 (1871)), this distinguished author has cited a large number of cases of natural hybrids.

Perhaps the most interesting example in this connection is the hybrid *Nuphar intermedium* which is a cross between *Nuphar luteum* and *Nuphar pumilum,* found distributed from the Black Forest and the Vosges northward into Russia and Lapland. In the southern part of its range, the hybrid is rarer and less fertile than it is further north. It is capable of extending its latitude northward of the range of both the parent species. Parallel cases are supplied by hybrids of *Epilobium, Brunella, Primula, Linaria, Rumex, Micomeria, Pulsatilla,* etc. In these various genera Kerner describes hybrids between wild species which often occur beyond the range of one or both of the parent species. Since the data supplied by Kerner on this subject can scarcely be questioned, it would appear that the absence of one or both of the parent species of a supposed hybrid in a given region is no valid argument against the hybrid origin of such an intermediate form. We have apparently still much to learn from our European colleagues both as regards accuracy and breadth of view in the matter of geographical distribution of hybrids. In the light of the above it does not appear necessary that the statements of Brainerd in regard to probable natural hybrids of *Rubus* should be accorded less credence and respect than have been given to his classic results in the case of natural hybrids in the genus *Viola.*

E. C. Jeffrey

Harvard University

STAR DIAMETERS

To the Editor of Science: Referring to the communication of Professor Fessenden concerning star diameters (Science, March 25, 1921, page 287–8), allow me to say that it does not seem possible that the measured diameter of Betelgeuse is affected by a gravitational displacement. In the first place, there are stars, of solar type for example, in connection with which the conditions would seem to be far more favorable for such a displacement and yet these objects show no appreciable disk. Further, we know that light reacts to a gravitational field in such a manner that there is no permanent acceleration in the direction of propagation. This fact reduces the possibility of a displacement to a

[1] Vermont Agricultural Experiment Station, Bulletin 217, Burlington, Vermont.

[2] *Rhodora,* Vol. 22, pp. 185–191.

rotation of the plane of the wave front, which would not increase the apparent diameter of a star.

In the case of either an orbital displacement or a rotation of the wave front, the observed deflection decreases with the distance and would be inappreciable at stellar distances. It can be shown that the sun at the distance of the nearest star would show a displacement at the limb, on the Einstein hypothesis, amounting to less than one millionth of a second of arc, if the deflected beam originated in a neighboring companion.

KELVIN BURNS

ALLEGHENY OBSERVATORY

RUSSIAN SCIENTIFIC MEN

TO THE EDITOR OF SCIENCE: Attention has been called in SCIENCE to the British "appointments committee for Russian scientific and literary men," under the chairmanship of Sir Arthur Schuster. Many Russians distinguished in various branches of learning are at present scattered over European countries, some of whom are destitute, while others are earning a precarious livelihood by work in which they have no opportunity of exercising their particular capabilities, the world at large thus losing the benefit of their knowledge and aptitude.

The object of the committee is to bring the names and qualifications of some of these men to the notice of universities and other institutions outside of Russia which may be able to offer them suitable employment. Lists of these names have been sent by the committee to various universities and organizations and the National Research Council has just arranged to send similar lists to the presidents of about two hundred colleges and universities in this country.

The council has also received a circular letter from a committee of meteorologists and geophysicists of Vienna which asks if certain kinds of statistical and preparative work needed by meteorologists and geophysicists of this country can not be done, for pay, in Vienna. These meteorologists and geophysicists have access to many valuable sources of statistics and general data and appeal for opportunity to do this work in order to assist in supporting themselves. Any communications which it may be desired to make to this committee should be addressed to Dr. A. Wagner, Zentralanstalt für Meteorologie, Hohe Warte 38, Vienna XIX.

VERNON KELLOGG

NATIONAL RESEARCH COUNCIL

May 27, 1921

SPECIAL ARTICLES

A CONVENIENT CULTURE MEDIUM FOR DAPHNIDS

Daphnia and other Cladocera may be fed upon certain unicellular green algæ, a mixture of various protozoa and protophyta obtained from the sediment of ponds in which there is a considerable quantity of organic matter, or upon bacteria.

For more than five years the writer successfully utilized material from ponds in obtaining food for Cladocera cultures representing several species. The somewhat discolored water was dipped up in such a manner as to obtain considerable amounts of the loose fluffy sediment lightly resting upon the bottom. In the strainings which followed (through silk bolting-cloth, to prevent contamination of the laboratory stock) much of this sediment was rubbed through the straining cloth and distributed with the water to the culture bottles (about 100 c.c. in quantity in ordinary wide mouthed 200 c.c. bottles). This method of obtaining culture water containing the proper food organisms has certain limitations. The water and sediment from most ponds do not constitute a proper culture medium; a pond from which a good culture medium may be obtained is hard to find. Further from month to month and season to season such a pond undergoes wide fluctuation in its usefulness as a source of daphnid food; it may even dry up and one's Cladocera material be imperilled or lost.

Some workers using algæ have cultivated them in jars of water; others on agar plates. The necessity for obtaining just the proper sorts of algæ and the requisite skill in their