

strain which would suffice to account for gravitation. But the outstanding difficulty would be to explain the high velocity of propagation of gravitation which seems to be required by the known behavior of the solar system under the action of the sun's gravitation.

Of course it may be that the failure of the linear relation between ether stress (electric field) and ether strain is associated with ether compression, and it might be possible to explain in this way the high velocity of the propagation of gravitation. The point, however, which we wish to emphasize is that mere ether compression alone is not sufficient to explain gravitation; at least the compressional energy must not be proportional simply to the square of the resultant field intensity, for in this case the compressional energy would not be distinguishable from the distortional energy which gives rise to the ordinary electric attraction and repulsion. If, however, the compressional energy were proportional to the fourth power of the resultant field intensity, then the ether compression would not stand in a linear relation to electric field intensity (ether stress), and the above remarks concerning excess of the electric attraction over repulsion would apply and gravitation would be provisionally explained.

W. S. FRANKLIN.

THE HOMING INSTINCT OF A TURTLE.

TO THE EDITOR OF SCIENCE: The following account from a friend, Miss Victoria Hayward, of Bermuda, may be of interest to your readers. I can vouch for the accuracy of the relater, and know from experience that the locating of an area on the reefs is as easy to a Bermudan as if it were on dry land. Miss Hayward writes:

"My father caught a turtle in June that weighed seventy-five pounds. He placed it in a pond in the harbor of St. George. In August on going to the pond he found that some person had thrown a piece of iron weighing about fifty pounds into the pond and it had broken a large hole in the turtle's back. It had been wounded apparently about a week and was weak and seemingly dead. My father thought he had better kill it, but he changed his mind, and let it go alive into the harbor.

"In the latter part of October he and another man recaptured it in the same place where they had caught it before—about four miles from land, on the flats (reefs) that lie to the north of the islands. The back was nicely healed and the turtle was altogether in excellent condition. You know that it requires no little knowledge of the art of navigation for a turtle to find the way from the southern side of St. George's Harbor through some one of the many little channels to its own special home on the north reefs—four miles out to sea."

C. L. BRISTOL.

BOTANICAL NOTES.

PEACH LEAF CURL.

ACCORDING to a bulletin (No. 20) prepared by N. B. Pierce and recently issued by the Division of Vegetable Physiology and Pathology of the United States Department of Agriculture, this disease appears to exist wherever the peach is grown. It is known to occur in North America, South America, Europe, South Africa, New Zealand, Australia, Japan and China. It is due to the presence of a minute parasitic fungus—*Exoascus deformans*—one of the simpler of the sac fungi—(Ascomyceteae). The fungus attacks the parenchyma of the leaves and twigs, enlarging, thickening, curling and distorting them. Eventually the leaves become yellowish and fall off, involving as a consequence the wilting and dropping of the fruit. It has been estimated that the annual loss in the United States from this source alone amounts to between two and three millions of dollars.

Mr. Pierce's paper discusses not only the structure of the fungus and the nature of the disease, but includes records of the many experiments which he made in order to determine what are the most efficient means for preventing or combating the disease in the orchard. He recommends spraying with Bordeaux Mixture of the following proportions: Copper sulphate, five pounds; lime, five pounds; water, forty-five gallons; applying it with what is known as a 'Cyclone Nozzle,' and doing the work from one to three weeks before the opening of the blossoms in the spring.

A NEW BOTANICAL JOURNAL.

MR. A. A. HELLER, the well-known botanical collector of Lancaster, Pa., has issued the first number of a new botanical journal bearing the euphonious name of *Muhlenbergia*. This first number is an eight-page octavo, well printed, on good paper. The prefatory editorial statement indicates that it is to be somewhat like Professor E. L. Greene's *Pittonia*, appearing, like that journal, at irregular intervals, and serving largely as the personal organ of its editor. The present number is devoted entirely to 'Some Changes in Nomenclature,' in continuation of the first pages of the 'Catalogue of North American Plants,' recently issued by the same author. Other numbers are promised to appear 'at early dates,' and they are to contain 'articles of general interest, both technical and non-technical, treating not only of flowering plants and ferns, but of the lower cryptogams as well.'

ENGLER'S 'PFLANZENREICH.'

THE indefatigable Berlin botanist who has brought one great work—'Die Natürlichen Pflanzenfamilien'—almost to completion, now undertakes a still greater work under the title 'Das Pflanzenreich.' The former treated of the families of plants, and the arrangement and brief characterization of their genera; the latter is to give full descriptions of genera, and diagnoses of all their species. The 'Pflanzenfamilien' was in fact a *Genera Plantarum*, supplementing, and to some extent supplanting, Bentham and Hooker's 'Genera Plantarum'; the 'Pflanzenreich,' on the other hand, is to be a universal 'Species Plantarum.' It is by all odds the greatest work in systematic botany ever undertaken.

It will be issued in the form of monographs, each family receiving separate treatment. For the present the work will be confined to the *Embryophyta siphonogama* (*Spermatophyta*), but it is the intention of the editor to take up later the *Embryophyta asiphonogama*, and ultimately the *Euthallophyta* and *Myxothallophyta*. The families are numbered, and the monographs will appear as fast as they are completed. The first one to appear is Family 45—Musaceae—from the pen of Dr. Karl Schumann. Its treatment

is such as to assure us of the most satisfactory results. In particular are the excellent illustrations to be commended.

CHARLES E. BESSEY.

THE UNIVERSITY OF NEBRASKA.

PRACTICAL RESULTS OBTAINED FROM THE STUDY OF EARTHQUAKES.

FROM observations on the destructive effects of earthquakes, the knowledge obtained respecting the actual nature of earthquake motion, and from experiments made upon brick and other structures, new rules and formulæ for the use of engineers and builders have been established. In Japan and other countries, these have been extensively applied in the construction of piers for bridges, tall chimneys, walls, ordinary dwellings, embankments, reservoirs, etc. Inasmuch as the new types of structures have withstood violent earth shakings, whilst ordinary types in the neighborhood have failed, it may be inferred that much has already been accomplished to minimize the loss of life and property.

The application of seismometry to the working of railways, particularly in Japan, has led to the localization of faults on lines, and alterations in the balancing of locomotives. The result of the latter has been to decrease the consumption of fuel.

Records of the unfelt movements of earthquakes indicate the time, the position, and what is of more importance, also the cause of certain cable interruptions. The practical importance of this latter information, especially to communities who may by cable failures, be suddenly isolated from the rest of the world, is evident. The many occasions that earthquake records have furnished definite information respecting disasters which have taken place in distant countries, correcting and extending telegraphic reports relating to the same, is another indication of the practical utility of seismic observations. Seismograms have frequently appraised us of sea waves and violent earthquakes in districts from which it is impossible to receive telegrams, whilst the absence of such records has frequently indicated that information in newspapers has been without foundation, or at least exaggerated. The