The paleobotanical collection is very meager and is interesting chiefly because of its geographic remoteness. There are recognizable species of *Taeniopteris, Sagenopteris* and *Araucarites*. Their age is most probably Jurassic. The presence of large Taeniopterids shows a relation to the contemporaneous Australian flora and indicates a point of difference from the Grahamland Flora, which is regarded to be of Upper Jurassic age. More abundant material might reveal the age of the Mount Weaver florule to be Upper Triassic (Rhaetic). *Sagenopteris* is a member of the Caytoniales. The two forms attributed to this genus may belong to a single species close to *S. plurifolia (phillipsi)*, but no complete compound leaf has been found. *Sagenopteris* is more abundant in the Jurassic than the Triassic.

Taeniopteris is an artificial genus which includes a diverse lot of similar leaves probably belonging to various cycadophytes. Leaves attributed to *Taeniopteris* first occur in the uppermost Carboniferous and extend to the Lower Cretaceous. However, the fine-nerved, broad mid-ribbed forms are characteristically Mesozoic.

The general aspect of the florule recalls that of a typical "Oolitic" flora of England, Australia or Japan.

The occurrence of a well-developed vegetation during Mesozoic times at a polar region deserves an explanation. Either the land-masses were located differently during remote antiquity or there was a marked difference in climate. The Wegenerian hypothesis of continental drift has found no support among American geologists, but it would offer an apparent explanation. Nevertheless, similar conditions of climate can be explained by other hypotheses which involve fewer difficulties.

According to the simplest statement of Wegener's theory, during the late Paleozoic the various "continents" began splitting apart and drifting westwardly. During the early Mesozoic, Australia, Africa and Antarctica severed their connections, but even Antarctica remained north of the Antarctic circle. Consequently a hospitable temperate climate would have existed. Few students of earth-processes deny all continental shifting, but few accept Wegenerism fully. More probably irregularities in earth motion, of astronomic cause, altered climate by "shifting poles."

Perhaps of more significance than the occurrence of fossil plants is the presence of good, relatively thick, coals on Mount Weaver. The coal is a dull, black, humic, bituminous material. Microscopic preparations are being made by collodion peels, maceration and grinding. Coniferous wood of araucarian type is present in the "bright bands" of the coal.

The fossil plants and coal will be fully described and figured in the near future. The collection will be exhibited in the galleries of the Geological Museum of Harvard University.

I am indebted to Professor Kirtley F. Mather for the opportunity to study these specimens.

WM. C. DARRAH

BOTANICAL MUSEUM
HARVARD UNIVERSITY

LAKE VEGETATION AS A POSSIBLE SOURCE OF FORAGE

COMMENTING upon the article by Dr. Ross Aiken Gortner, of the University of Minnesota, published under the above title in SCIENCE, No. 2084, of December 7, 1934, I should like to point out that in Yugoslavia it is a general custom among the peasants to use water plants as forage in districts subject to drought in summer and where there is an abundance of vegetation in the waters. For example, one district where this use is made of water plants is that of the Gacka river near Otočac in the Lika region, which is part of Croatia. The Gacka is a ponor-river about 20 kilometers in length and contains a great many springs rising from the floor of the river bed. It has an even temperature all the year round, which does not fall below 9° C. in the winter nor rise above 20° C. in the summer. The course of the river is not very steep, and the water flows gently on in an even deep bed. For this reason it produces luxuriant vegetation throughout the year. The most common plants found in it are miriophyllum, potamogeton, ranunculus and callitriche, while nasturtium grows near the springs and sphagnum in the lower course of the river, which forms a lake at certain times of the year. The country through which the river flows is rocky, with only a shallow layer of vegetable soil, which often dries up completely during the hot summer months, and only produces sufficient fodder for the cattle in the spring and autumn. In that district the peasants may be seen using the river vegetation as fodder throughout the whole year, but particularly during the hot summer months and in the winter. Every day they cut the water plants just above the roots with a kind of long-handled scythe or simply drag them up with long rakes. Then they collect the plants on the surface of the water and load them onto a primitive kind of canoe hollowed out of the trunk of a tree. The plants are only dried for a short time, long enough to drain off the water, and are then used as fodder while still *fresh*, that is to say, in the green state. The cattle like this fodder and digest it as easily as the ordinary green fodder. From this, it is obvious,

therefore, that where similar conditions exist, that is to say, where there is an abundance of water plants in clear cool waters, the former can be used for fodder with great advantage.

I have found from experience that the vegetation growing in marshy warm waters can not be used to feed cattle on account of the musty odor, which they dislike. For example, plants growing in ponds used for carp breeding are not suitable for fodder. Cows, in particular, show a marked aversion to musty-smelling fodder and are reluctant even to eat the grass round the edges of the ponds. If they are forced to eat this kind of fodder by being given none other, the result is that they give less milk.

VILIM MRŠIĆ
MORPHOLOGIC-BIOLOGICAL INSTITUTE
UNIVERSITY OF ZAGREB, YUGOSLAVIA

EGGS BY PHEASANTS AND QUAIL INDUCED BY NIGHT-LIGHTING

IN SCIENCE for March 13, 1936, appeared a short note by Clark, Leonard and Bump[1] describing the results of some experiments on "Light and Reproduction in Game Birds." The birds used were pheasants, quail and grouse. The method followed evidently was one adapted from the earlier work of Bissonnette[2] on starlings and ferrets.

Beginning on December 16, 1935, we have carried out similar experiments independently on pheasants and quail, using Bissonnette's improved methods of illumination.[3] One cock and four hens of the hybrid ring-necked variety of pheasant and a single pair of quail were used as experimental animals. The rest of the colonies of these types of birds were used as controls. The birds were kept in outside cages subject to winter conditions.

On January 15, at thirty days of experimental lighting, the pheasants began to lay and before the 28th they were laying at the rate of about three and a half eggs each day of twenty-four hours in spite of very severe weather. Before March 16 well over 120 eggs were laid by the four hens. Three of them are still laying well at date of writing.

Of the first 37 eggs laid and incubated in an improvised electric incubator, 32, or about 86.5 per cent., were fertile and began development. Owing to trouble with the electric lighting none hatched. Two eggs from a setting placed under a hen and accidentally broken had live chicks in them. The single female quail began to lay on March 22 and is continuing to do so, but none of her eggs have yet been set. None of the controls have yet begun to lay (March 30).

Details of these experiments will be published elsewhere. The authors wish to acknowledge the valuable cooperation of the State Department of Fish and Game of Connecticut, without which these experiments could not have been carried out.[4]

T. HUME BISSONNETTE
TRINITY COLLEGE

ALBERT G. CSECH
SHADE SWAMP SANCTUARY
FARMINGTON, CONN.

[1] L. B. Clarke, S. L. Leonard and G. Bump, SCIENCE, 83: 2150, 268, March 13, 1936.

[2] T. H. Bissonnette, *Quart. Rev. Biol.*, 8: 2, 201–208, 1933.

[3] T. H. Bissonnette, *Jour. Exp. Zool.*, 71: 2, 341–373, 1935; *Jour. Exp. Zool.*, 27: 4, 315–320, 1935; *Anat. Rec.*, 63: 2, 159–168, 1935.

SOME RARE BOOKS ON PROTOZOOLOGY

VERY recently Gustav Foch, of Leipzig, has made a reprint of the monumental work of Ph. Fr. de Siebold "Fauna Japonica," published the first time in 1833–50, and considered since as a classical reference book. Unfortunately, the small original edition and the prohibitive price account for the scarcity of the work. The reprint fills a serious gap in many libraries.

It occurs to me that there are many old and very important reference books on protozoology, as for instance Muller's "Animalcula Infusoria," 1786; Ehrenberg's "Die Infusionsthierchen als Vollkommene Organismen," 1838; Dujardin's "Histoire Naturalle des Zoophythes Infusoires," 1841; Claparéde and Lachmann's "Etudes sur les Infusoires et les Rhizopodes," 1858–61; Stein's "Der Organismus des Infusionthiere," 1854–83; Saville Kent's "A Manual of the Infusoria," 1880–81; etc. All of them are out of print to-day, and when listed in second-hand book catalogues they have a very high price. That accounts for the lack of reference works so important, not only in private laboratories but also in libraries of smaller institutions.

It would be welcome to very many serious students of the protozoa, especially for those not connected with great institutions, if some firm should make a reprint, as economically as possible, of the abovementioned books. I am sure that, if properly advertised and moderately priced, such reprinted books would have quite a large demand, and make profitable the enterprise.

ENRIQUE BELTRÁN
NATIONAL SCHOOL OF AGRICULTURE
CHAPINGO, MEXICO

SOURCE MATERIAL REQUESTED

WE are starting to work on the history of the botanical succession in the upper Hudson Highlands. To do this thoroughly, we must first reconstruct the original forests as they existed hereabouts at the time

[4] Aided by grants from the National Research Council, Committee for Research in Problems of Sex.