the weathering having been almost completely eliminated. These are just a few out of numerous instances where shells and fossils have afforded data useful in the study of the sorting power of wind and water. Incidentally, they suggest the explanation of occasional occurrences of "pockets" and "streaks" of fossils in the rocks which would otherwise be very puzzling.

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A TERRESTRIAL AMPHIPOD IN THE UNITED STATES

A TERRESTRIAL amphipod, *Talitrus alluandi,* has been found in abundance in a greenhouse in Ohio. Besides its natural habitat, which appears to be the Indo-Pacific Islands, it has also been recorded from several localities in Europe, where it apparently has been carried and has become established locally. The most recent of these reports is one by K. Stephensen in 1924 on the finding of this organism in a greenhouse in Copenhagen.

The fact that the specimens under consideration were found in large numbers in a greenhouse in Columbus, Ohio, would lend support to the idea that this form has likewise been transported to this country and has survived for more than two years in an environment which simulates tropical conditions.

The specimens, measuring from two to four and a quarter millimeters in length, were found in great abundance in a greenhouse of the Fifth Avenue Floral Company, at Columbus, Ohio, by Mr. H. Walker, of the Ohio State University, and were given to the writers by Dr. Raymond C. Osburn. Search has been made in many other greenhouses but without success. They have, however, subsequently been cultured successfully in the laboratory at Cleveland.

It is believed that this is the first record of a completely terrestrial amphipod found within the United States. *Talitrus alluandi* was described by Chevreux in 1901, in the *Mem. Soc. Zool. de France,* 14: 389–393.

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PLANT LICE PUMPING IN UNISON

THE phenomenon, "flashing of fireflies in unison," discussed on page 132 in the January 31 and on page 537 in the May 23 issues, prompts me to report some observations of the curious behavior of aphids. These insects appear to lift their bodies simultaneously in the act of feeding, sucking the sap of a host plant. Following the theory described in the second discussion mentioned above, the insect on seeing his neighbor rise for inspiration or pumping may himself rise to keep in step and thus all in a like way tend to synchronism. But apparently incidence of light is not a motive, as the writer has placed a cardboard screen around the sides of an individual feeding in proximity to many others and this individual kept in step right on with the others, and even when there was a pause all along the line he paused too, and on recommencement of the lifting or inflating of their bodies in the act of sucking again, the screened individual was found to be in step as before, although he could not see any of them. It was noted that a colony of the insects rising in unison on a branch somewhat removed from another collection rising in unison on another branch did not coincide in moment, *i.e.,* each individual colony rose as a man, but did not rise in unison with the other colony.

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SPECIAL CORRESPONDENCE

A NATIONAL SYSTEM OF EXPERIMENTAL FORESTS AND RANGES

THE Acting Secretary of Agriculture recently approved a National Forest regulation which marks a new epoch in the forest-research work of the United States. The regulation is as follows:

> The forester shall determine, define and permanently record a series of areas of national forest land to be known as experimental forests, sufficient in number and extent adequately to provide for the experimental work necessary as a basis for forest production or forest and range production in each forest region, these areas to be dedicated to and used for research; also where necessary a supplemental series of areas for range investigations to be known as experimental ranges; and a series to be known as natural areas sufficient in number and extent adequately to illustrate or typify virgin conditions of forest or range growth in each forest or range region, to be retained in a virgin or unmodified condition for purposes of science, research and education; and a series of areas to be known as primitive areas within which will be maintained primitive conditions of environment, transportation, habitation and subsistence, with a view to conserving the value of such areas for purposes of public education and recreation. Within any areas so designated, except for permanent improvements needed in experimental forests and ranges, no occupancy under special use permit shall be allowed, or the construction of permanent improvements by any public agency be permitted, except as authorized by the forester or the secretary.

The purpose of the experimental forests is to make permanently available, for silvicultural, range, products and other related forest research, areas as fully representative as possible of conditions in important parts of forest regions and large enough to meet present and foreseeable needs. In essence these areas are to be field laboratories for intensive investigative work. A secondary but hardly less important purpose is to provide for the demonstration of results, favorable or otherwise, of widely varying silvicultural and other forest practices. Each experimental forest is to be chosen on the basis that it adequately represents the subregion in which it is located as to forest types and sites and the conditions which underlie types and sites (such as soils, climatic variations and altitudinal range). Wherever possible each experimental forest is to include a "natural area" on which are to be preserved in an unmodified condition examples of the virgin growth of each forest or other vegetative type within each forest region, to the end that the region's characteristic plant and animal life and soil conditions shall continue to be available for scientific and educational purposes.

So far as can now be foreseen, from five to ten experimental forests will be required within each of the twelve or thirteen forest regions specified in the McSweeney-McNary Forest Research Act. Their areas will range from about 1,500 acres to about 5,000 acres, averaging about 3,500 acres, exclusive of the lands to be reserved as natural areas. They will not be so large as to impose any unnecessary burden of administration. Size will be governed primarily by the complexity of the type and by the growth rate of the tree species. The simpler the type and the higher the growth rate the smaller the area that will be required. In a subregion where it is not possible to find a satisfactorily representative single area it may be preferable to establish, as one unit, two or even three separate areas within easy working distance of the same headquarters.

For a natural area 1,000 acres is regarded as the minimum desirable under average conditions, but the acreage will vary with the type of forest involved or, possibly, with climatic and topographic conditions. About a dozen such areas will be required in each forest region. Where areas suitable for experimental forests or natural areas can not be found on existing national forests, consideration will be given to the possibility of acquiring suitable areas by gift or exchange or, as a last resort, by purchase.

Experimental ranges will be established under the same principles as experimental forests.

On the experimental areas scientific and educational uses are to be dominant, commercial utilization and public occupancy subordinate. On natural areas commercial use will be prohibited and public use will be restricted as far as practicable. For convenience of administration and protection the areas will remain essential parts of the national forests on which they are situated, but responsibility for their management and use will rest wholly with the directors of the forest experiment stations. The boundaries of the natural areas and the principles to govern their management are to be established by the forester and are not to be modified except with his approval.

While natural areas will be established primarily to meet the needs of the Forest Service, their use by other research or educational agencies for purposes which do not conflict with Forest Service projects will be allowed under appropriate cooperative agreements approved by the forester.

The readiness with which title to lands can be established under certain of the public-land laws gives rise to some uncertainty at present as to the ability of the Forest Service to safeguard the integrity of the experimental forests and ranges and the natural areas from adverse occupancy and use, but it is believed that as soon as the system has taken definite form and its vital importance to public welfare is established and recognized Congress will make legislative provision for preserving the areas permanently.

The reference in the regulation to primitive areas repeats the language of an earlier regulation under which a comprehensive system of primitive areas is now taking form on the national forest.

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U. S. FOREST SERVICE

SCIENTIFIC APPARATUS AND LABORATORY METHODS

CULTURE MEDIA FOR OPALINIDAE

THERE seem to be three major desiderata in culturing Opalinids: (1) To supply predigested food. Without it I doubt the success of Larson and Allen's[1] experiments or any others. Despite Konsuloff's suggestion[2] that *Opalina* manufactures digestive enzymes and pours them into the "cecal" chamber of the frog host, there to aid in the further digestion of food for

[1] Larson and Allen, "Further Studies on the Reaction of Opalina to Various Laboratory Culture Media," *Univ. Kansas Science Bulletin*, 18: 8, April, 1928.

[2] Konsuloff, "Untersuchungen über Opalina," *Arch. f. Protistenk.*, 44, 3, March, 1922.