proposed to be done by the National Association for the Preservation of Buffalo-grass. Could not the lesser be served by the greater? Might not the part be included in the whole?

I am the more urged to these reflections, when I recall the fact that there are parties who are now thinking of forming a National Society for the Preservation of Mountain Laurel (*Kalmia latifolia*) and the Trailing Arbutus. Poor things! It seems, that unless something is done, the Trailing Arbutus will become extinct at a not far-off date, and the laurel of our hill-sides will all be used up for Christmas decorations. These beautiful plants will go the way of the Passenger Pigeon. Nevertheless there is the awful consideration which confronts me, as I know it does a number of other kind-hearted men, that we are not able out of the slender resources of our salaries to pay the expenses of a president, a secretary, and all the printing, which are involved in carrying on a campaign from year to year, possibly from century to century, for the Preservation of Buffalo-grass or even Trailing Arbutus or Mountain Laurel.

What are we going to do about it? As I look at my desk piled high with requests to contribute to such most worthy causes, I sigh for "the wealth of Ormus and of Ind." Then I turn to my beggarly bank-book, which I have just had balanced, showing that I have available for expenditure the sum of $.23. (Skiddoo!) It is indeed cruelly distressing to think that I can not help to satisfy all the brilliant philagrostic, philozoic, and philanthropic yearnings of an agitated nation. But I have only twenty-three cents in bank!

W. J. HOLLAND

OPALINA JAPONICA SUGIYAMA [NOT METCALF]

IN Bulletin 120 of the United States National Museum I described as new *Opalina japonica* from *Rana japonica* from Japan. I have since learned that Takesi Sugiyama had already given this name to an *Opalina* from this same host. Although in both infections which I studied the parasites were a little smaller than in Sugiyama's material, there seems no doubt but his forms and mine are of the same species. The name and both his and my descriptions stand, but the authorship of the name is his. Sugiyama's paper[1] is careful and painstaking and is illustrated by beautiful drawings, many in color, which are well worth study.

MAYNARD M. METCALF

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[1] "Studies on the structure and the nuclear division in a Japanese species of Opalina, *O. japonica*, nov. spec.": in Journ. Coll. Agriculture, Imp. Univ. Tokyo, Vol. VI, no. 4, Nov. 20, 1920.

THE NORTHERN RANGE OF THE SCORPION

IN a recent communication to SCIENCE (Sept. 28, 1923) Mr. R. L. Webster records the finding of *Vejovis boreus* (Girard) at several localities in the "Bad Lands" district of North Dakota and mentions its occurrence, as indicated by specimens in the National Museum, in Oregon and Idaho in addition to more southern states. As these records do not adequately indicate the northern range of this scorpion, it seems desirable to note that it is not infrequently met with in Montana, northern Idaho and Washington, where I have personally taken specimens close to the Canadian border. Recently Professor C. T. Brues placed in my hands for identification a specimen of this same species which had been taken by Mr. F. S. Carr at Medicine Hat, Alberta, Canada, a place in Lat. 50° N. and noted for its low temperatures.

R. V. CHAMBERLIN

CAMBRIDGE, MASS.

I have found scorpions in two localities in Montana. In April, 1922, I found three individuals in a crack in a sandstone escarpment in Township 35 North, Range 1 West, Toole county, Montana. A single individual was found in Section 21, Township 2 South, Range 20 East, one mile west of Columbus, Stillwater county, Montana. It was not convenient to collect the animals and the species was not determined. So far as the writer is aware scorpions have not heretofore been reported from Montana.

EARNEST GUY ROBINSON

BILLINGS, MONTANA

THE MARQUESAS

LARGE amounts are annually donated by men of means to various institutions for explorations and research for the advancement of archeology, botany, astronomy, biology and other sciences.

The dying out of the populations in some of the Pacific archipelagoes and the consequent gradual dying out of the seedless breadfruits would seem to call for action of this kind before it is too late. In doing so, not only would some of the most interesting relics of a vanishing people be saved from extinction, but unlike the vast material preserved in museums, they could be made useful for coming generations in furnishing a valuable food.

In "White Shadows in the South Seas," Frederick O'Brien says that the days of the Marquesans are numbered. In an article in the *National Geographic Magazine* for October, 1919, J. W. Church corroborates this and says that his census of that year found only 1,950 people alive in the Marquesas, and that in the five preceding years the population had decreased

more than 33 per cent. and that ten years thence there would not be a full-blooded Marquesan alive. Once populous valleys are already swallowed up by the tropical jungle.

It is a well-known fact that cultivated plants can not successfully compete with the wild vegetation when the protecting arm of man is removed. And as the Marquesan is doomed to extinction, so will his breadfruits—by travelers described as superior to all others of their kind—inevitably follow if man does not intervene. Some of these varieties may have become extinct already or be near extinction. In the Society Islands the situation is but slightly better. I quote as follows from a letter recently received from a correspondent in the Fiji Islands: "The Tongan colonists in these islands seem to be the only people that are giving any attention at all to the breadfruit. I fear that this splendid fruit is gradually being permitted to die out."

While the disappearance of the breadfruits would be an economic loss, there would be, in addition, the sentiment of the loss of that which has been the staff of life of one of the races of man which our own civilization had destroyed. Nor should it be forgotten that while in the sciences and trades a lost art or a lost invention may be rediscovered, in the plant world this is not so, for when the last individual of a species or a variety has passed away, it is irrevocably lost. Again, for all that has been written about the breadfruit and the multiplicity of its forms, the curious fact remains that not more than three varieties appear to have found their way from the South Sea archipelagoes to other lands. Finally, as has already been stated, the gathering together of the breadfruit varieties in the Pacific archipelagoes for a comparative study should add further evidence relative to the much mooted question of the migrations of the peoples within those regions.

Various writers and correspondents have quoted more than 100 variety names of the breadfruit. With a liberal allowance for synonyms there must be at least 35 varieties.

I estimate that an expedition to the Marquesas and Tahiti covering a year would be sufficient to get together the largest number of varieties (including the most valuable ones) at the least expenditure, and that this would cost $8,500. I estimate that it would require three years' work to gather together plants of all the breadfruits in the Pacific, including the Society Islands, Marquesas, Samoa, the Fiji Islands and the Caroline Islands. The expense is estimated at $24,000.

Correspondence relative to the subject is invited.

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LABORATORY APPARATUS AND METHODS

DRIED PREPARATIONS OF EARTHWORMS[1]

FOR many years the usual method of studying the structure of the earthworm has been to dissect it wet and to study thin sections of it. This method will doubtless remain the standard. However, I have recently discovered that earthworms, if properly freed from ingested soil, fixed, dehydrated in alcohol and then dried can be readily cut in such a manner as to reveal in a strikingly clear fashion all the structures usually studied, except the histological details. Indeed, these preparations show many details not usually seen in wet dissections or in sections. In brief, the method of preparing the worms is as follows:

Free the worms from their ingested materials without permitting them to eat filter paper or paper towel, since these fibers are difficult to cut when dried. Anesthetize in any approved manner; fix and harden by immersion in, or by injection with, a chromic acid solution (2 to 5 per cent.); lay them out straight in the fixing solution and allow them to harden for 12 to 24 hours; wash for an equal time or longer in running water; dehydrate with alcohol; then permit them to dry at room temperature. Prolonged preservation in alcohol tends to bleach them and the addition of terpeneol (1 part to 19 of 95 per cent. alcohol) has a marked bleaching effect. This is desirable for some types of preparation. In drying, some of the worms shrink somewhat, but many of them, if well hardened, do not shrivel, but the muscular layers become thinner. Dried worms, thus prepared, have a tough, leathery consistency which is firm but not brittle. They can be relaxed in a moist chamber just as insects are relaxed either before or after the dissections are made.

The external features that may be seen as well or better in the dried worm than in the wet are the setae, somewhat abnormally protruding owing to the thinning of the body wall, the nephridial pores, dorsal pores, openings of the receptacula seminis and oviducts. Openings of the vasa deferentia do not show so well as in the wet worms.

To dissect the dried worm hold it in the fingers and cut away portions of the body wall, or split the worm or pieces of it on or near the mid-dorso-ventral plane, using a sharp, thin-bladed scalpel or safety razor blade. The cutting must be done with a clean stroke with a slanting cutting edge. The blade will require frequent honing or stropping. Shaving away successive thin slices usually results in shattering the tissues. A useful preparation, but difficult to make, may be made by slicing away the body wall of the

[1] Contribution from the Zoological Laboratory of the University of Michigan.