has been reported from one of the western states. All the other west American crayfishes are members of the genus Astacus, while all the crayfishes of the United States east of the Rocky Mountains belong to the genus Cambarus, with the exception of *Astacus gambelii,* which ranges across the divide from Utah and Idaho into Montana and Wyoming, where it is found in the upper tributaries of the Missouri River.

Cambarus clarkii has been previously reported from Texas and several other southern states, and it is an interesting fact that this is one of the species of Cambarus whose previously known range approaches most closely the southern part of California. Nevertheless, the Californian and the Texan representatives of this species are separated by a long, arid stretch of over 800 miles. This is a quite unusual discontinuity in the distribution of a species, but it is possible that other specimens may be found in some of the small streams of the intervening territory in Arizona and New Mexico. It is also possible that the forms may be artificially introduced, although crayfishes are not commonly distributed in this manner. A species of crayfish would encounter many difficulties in extending its range across the deserts which lie between southern California and Texas, unless it migrated in a period when the rainfall was much more plentiful than it is at the present time.

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ON BOTANY ON THE CAMPUS

PROFESSOR TRELEASE, in his article in SCIENCE for August 1, calls attention among many other interesting things to the need of introducing the embryo agriculturist to plants as they grow, and to the European botanical gardens which serve the purpose. Isn't it conceivable that something of the sort might be done under American conditions? I think any aggressive botanical department would be glad to do the work if it had any reasonable hope that the plantings would be permanent.

Here there have been a number of fine groups of native and introduced plants that have been used for such instruction. But they have no protection from the administrative authorities in charge of the campus; and even in the few years I have been here a large proportion have been either dug out with a steam shovel or buried under twenty feet of earth, sometimes to make way for something equally or more useful, but frequently merely to straighten a drive or level a piece of ground. This spring one of the two small areas of natural shrubbery on the main campus was slashed off, and most of the trees also cut down, without even the excuse of any construction on the site, but apparently merely because it was in the neighborhood of a new building that was going up. (A *dead* hickory was left standing alone.)

I wonder if there is hope of sufficient reform in grounds administration to make the building up of a collection of the necessary types of plants a possibility. I imagine conditions are no worse here than on most rural campuses. The problem on a crowded city campus will be largely of a different sort.

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OSMOSIS DEMONSTRATION FOR BIOLOGY CLASSES

DR. CLAYBERG'S observation regarding the demonstration of osmosis set up by biology teachers (SCIENCE, LX, 100, August, 1924) that "sometimes the thing does not work," applies unfortunately over a large part of these United States. I have found teachers of all degrees of intelligence and training shy at the demonstration as usually described in the textbooks, and resort finally to the classic egg and sealing wax, which is confusing to the student rather than illuminating. The chief practical difficulty is apparently that of attaching a membrane to the funnel or thistle tube so as to leave no leaks.

The use of celloidin bags I find eminently satisfactory. Although this has been repeatedly described in technical literature, teachers seem to be afraid to try it because they were not themselves taught it in school or college. But it is easy enough after one or two trials.

This method consists of: (1) preparing the celloidin bag before the class: Pour some "newskin," celloidin dissolved in ether-alcohol, free from acetone, into a four-ounce wide-mouth bottle, dry; pour out again all you can, back into the container, rotating the bottle constantly, slowly, so as to spread a very thin layer of the celloidin over the entire inside surface; remove ether and alcohol by ventilating inside of bottle—that is, blow into it several times; after the odor of ether is gone, rinse out with water, which removes most of the alcohol; gently work out the membrane, beginning at the neck of the bottle, pouring a little water between membrane and glass—the whole skin can be removed without breaking it. (2) setting up the "artificial cell" or "root hair": Insert a No. 4 or No. 5 rubber stopper, two holes, in the neck part of the bottle-shaped celloidin capsule; insert thistle tube into one hole of stopper; pour in sirup or whatever solution you intend to use until bag is quite full and overflowing; plug second hole; suspend in water—use clamp on ringstand, holding at level of rubber stopper.

To fasten bag to stopper, I find either several windings of rubber band or cementing with fresh celloidin solution satisfactory. The thistle tube may be re-

placed with a yard or two of glass tubing to get a higher lift. This whole outfit can be set up and show a rise of several inches to a foot or more within the usual forty-five minute period. It is free of complications necessarily present in the egg or parchment; it holds the interest of the students; it simplifies the problem and facilitates understanding. And it really takes less time than the other demonstrations. Bags prepared in this way in advance may be kept indefinitely suspended in sterile water, with the rubber stoppers in place ready for instant use.

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DISCUSSIONS AT SCIENTIFIC MEETINGS

THIS is to voice the sentiments of many scientists with whom the undersigned has spoken concerning the machine-like method with which our scientific meetings are conducted. Time was and not far distant in the past when each paper was given critical examination and rarely indeed did a conclusion escape open-air discussion, with the result that erroneous conclusions did not bear the weight of conviction from having been presented to some august society and the conclusion not challenged. In the days when the Society for Experimental Biology and Medicine was enlivened by the searching criticisms of men like Lusk, Jacoby, Meltzer and others, both profit and pleasure resulted. It is common, at the present time, for the presiding officers of our societies to announce that eight minutes are available for the reading of a paper and two for discussion. The logical method would be to reverse this program.

Any attempt to limit the number of papers entails difficulties, but they are not wholly unsurmountable. If we keep clearly before us what value we expect from the reading of papers, our criterion is set. Then we may entrust to a selected group of men (or to a single member) the designation of a relatively few papers bearing the stamp of importance, or of some especial virtue such as promise, or even to further the work of some young and promising worker. There are always men who will place their own benefits above those of the majority, and they will be offended by not having their papers selected. There will always be papers embodying important factors which, because they are not evident, are passed by. However, in the long run, ten papers critically examined are preferable to double the number passed through the program like the film in a movie.

A decigram of discussion is worth a kilo of pulpwood paper required to print erroneous conclusions and faulty technique.

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HEARING AND NOISE

IN the article on "Graduated amplifiers as an aid to hearing" in the June 20th number of SCIENCE appears this statement: "The fallacy that deafened persons can hear better in noisy surroundings was disposed of by Dr. Fletcher," etc.

The truth of the matter is that people who are deaf because of fixation of the foot plate of the stapes often do hear better in noisy places, as every otologist knows.

I recall one man who was so deaf I had to shout to make him hear, yet he stated that he could hear a pin drop in a boiler shop. Another patient, who was also quite deaf, said she could hear perfectly if the piano were being played.

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SOME REMARKS ON THE LITERATURE OF RUST FUNGI

WHILE reading various mycological publications, the writer has noticed certain errors and omissions in reference to matters of fundamental importance, to which he wishes here to call attention and also to add some comments that may be of interest, bearing upon the same or similar subjects.

On page 202 of Harshberger's text-book,[1] which, by the way, is one of the best books of its class that the writer has read, it is stated that the black stem rust of wheat (*Puccinia graminis tritici*) occurs seldom on barley, whereas it is the common stem rust of barley, as well as of wheat, in the United States. Eriksson is evidently meant to be authority for the statement, as it is repeated on page 562, and there directly credited to him. Nevertheless, in 1899 the writer published results,[2] showing that barley stem rust and wheat stem rust are the same. (This publication is not included in the bibliography of the book.) Dozens of investigators have since confirmed these results, and yet others have made this same error of statement. To state an elementary fact, that should be generally known, but apparently is not, there are in the United States (1) a form of black stem rust very common on barley and wheat, (2) another distinct form on rye and rarely on barley, and (3) a third distinct form on oats, each of these being found

[1] Harshberger, John W., "Mycology and Plant Pathology," XIII + 779 pp., 271 ills., P. Blakiston's Son & Co., Philadelphia, 1917.

[2] Carleton, Mark Alfred, "Cereal rusts of the United States, a physiological investigation," U. S. D. A. Div. Veg. P. & P. Bull. 16, 74 p., 1 fig., 4 col. pl. Bibliogr. pp. 70–73, 1899.