as well as the general stratigraphic and paleogeographic relations, make out a good case for the Pennsylvanian age of these beds.

The work is illustrated by many halftones, sketch maps and diagrams and fully measures up to the highest standards. The authors are to be commended on the excellence of their work which, with the liberal policy of their company already referred to, sets a standard that other companies might well imitate to the lasting advantage of geologic science.

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THE STATUS OF TEREDO BEACHI AND TEREDO NAVALIS

I HAVE so far refrained from commenting on the efforts of Professor Kofoid and his students to discredit the validity of my *Teredo beachi*. A review in the *Nautilus* for April, 1923, on page 140 of Robert Cunningham Miller's paper on the "Variations in the shell of Teredo navalis in San Francisco Bay," University of California Publication in Zoology, Vol. 22, No. 2, pp. 293-328, bears the following statement which is a slightly abbreviated rendition of Miller's statement on page 25 (317) "The local varieties, including *T. beachi* Bartsch, have not been found sufficiently differentiated to warrant their being classed as subspecies, much less as species."

This, I feel, makes it necessary for me to protest lest my silence be construed as concurrence in the opinion of my West Coast critics.

The paper in question is a beautiful intensive study of *Teredo beachi* Bartsch and, barring the summary, in which the systematic status of this species is discussed, a splendid piece of work. It is unfortunate that the author in question, as well as Professor Kofoid himself, has not made an equally intensive study of the European *Teredo navalis,* which I have been unable to find in American waters, before publishing this summary, for I am certain that had they so done, they themselves would have become acquainted with the characters that differentiate the *navalis* group from the *Teredo morsei* group, to which *Teredo beachi* belongs.

In *Teredo navalis,* the denticles on the anterior median area have but a single cusp. In the *Teredo morsei* group they are multicuspid. That at once differentiates the two groups and there are hosts of other characters that separate the members of these groups into specific or subspecific elements.

The only member of the *navalis* group that I have found so far in American waters is the New England shipworm, *Teredo novangliae* Bartsch. All the other true *Teredos* seen belong to the *morsei* group, both on the east and the west coast of America.

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NICOTINE AS A POULTRY VERMIFUGE

FOLLOWING the work of Herms and Beach in 1916, the University of California Agricultural Experiment Station has been more or less continuously interested in the use of tobacco and tobacco products as a vermifuge for the intestinal worms of poultry, *Ascaridia galli* Schrank 1788 (= *A. perspicillum*). Work carried on during the past year and a half with hundreds of hens has shown that commercial tobacco dust containing from 1½ to 2 per cent. nicotine if fed in the mash in quantities equalling 2 per cent. by weight of the latter over a period of one month would remove from 98 to 100 per cent. of these worms. The results have also demonstrated that from 80 to 85 per cent. of the cecum worms, *Heterakis gallinæ* Gmelin (=*H. papillosa,* = *H. vesicularis*) are removed by this treatment. The tobacco dust must be mixed with the mash at intervals not exceeding one week on account of the volatility of the nicotine in the presence of air.

Diluted nicotine sulfate administered to the birds directly in quantities sufficient to remove the worms is decidedly toxic. Mixed with the mash or drinking water it renders them so distasteful that the birds will not eat or drink properly. However, by mixing the nicotine sulfate with Lloyd's Alkaloidal Reagent, a selected fuller's earth, perfect elimination of the intestinal worms has been secured, although the cecum worms remained unaffected. The method employed was that of mixing the nicotine sulfate (40 per cent. nicotine) at the rate of 6.6 cc. to 16 grams of the reagent. This mixture was then placed in gelatine capsules (No. 2), one of which when filled weighed

approximately 350 milligrams and constituted a treatment. The Lloyd's reagent holds the nicotine as long as the mixture is in an acid medium, liberating it when it becomes alkaline. The small intestine is slightly acid at its anterior end but becomes rapidly alkaline at about the point where the intestinal worms are present in the greatest numbers. Thus the nicotine is liberated at the desired point for the maximum effect on these worms. Rectal injections of nicotine sulfate (40 per cent. nicotine) diluted at the rate of 1 cc. to 200 cc. of distilled water and administered in 10 cc. injections remove approximately 85 per cent. of the cecum worms. Stronger concentrations are decidedly toxic, a 1 per cent. mixture administered in the same manner causing an immediate paresis and death in about ten minutes.

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TO DEMONSTRATE PROTEIN GRAINS

ONE of the most effective ways to demonstrate the presence of protein grains in the cellular tissue of a seed is by making a free-hand razor section of the meat of a Brazil nut. Place the section on a glass slide, and flood it several times with ether. If enough ether is used to cause it to flow over the edges of the slide the dissolved fat will collect on the under side of the slide where it is easily wiped off. After treating with ether flood with absolute alcohol; replace the alcohol with xylol and mount in xylol, or if a permanent mount is required mount in balsam. The Brazil nut is rich in its peculiar kind of protein, and by this method several of the grains may be seen in nearly every cell.

E. R. SPENCER

AMEBOID BODIES ASSOCIATED WITH HIPPEASTRUM MOSAIC

IN a recent publication[1] the writer described and pictured certain bodies in the cells of corn plants suffering from mosaic disease. Since the bodies are confined to diseased portions of the plant, it was suggested that they might be of etiological significance.

[1] Bul. Exp. Sta., H. S. P. A., 3: 44-58 (1921).

Those who are working on the mosaic disease problem will be interested to know that similar bodies have now been found in the light green portions of mosaic leaves of *Hippeástrum equéstre* Herb. This plant belongs in the Amaryllidaceae and is not closely related to corn. Its leaves which are thick and soft are well suited for cytological studies. The mosaic pattern shown by *Hippeástrum* is quite different from that of corn. The intracellular bodies associated with this disease will be described in detail in a future paper.

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SCIENTIFIC BOOKS

Laboratory Manual of Colloid Chemistry. HARRY N. HOLMES. John Wiley & Sons, Inc. XII + 127 pp.

THIS volume was written at the suggestion of the Colloid Committee of the National Research Council. Colloid chemistry is growing rapidly and this book is a welcome addition to the colloidal literature. There are 186 experiments, from which the student is expected to select the ones suited to his particular needs.

There are first of all methods of preparation and purification followed by illustrative examples of peptization and coagulation, of protective colloids and solvated colloids. The measurement of surface tension and viscosity are treated in brief chapters. In a chapter on adsorption several experiments are given on silica gel. The use of the ultra-microscope receives two pages. Experiments on hydrogen ion concentration and osmotic pressure and Donnan equilibrium are not included. Descriptive matter preliminary to the experiments makes the work easy reading and stimulates the use of the author's bibliography.

In classical chemistry we have used quantitative measurements to the greatest advantage, melting point, boiling point, solubility, percentage composition and molecular weight and they give the firmest sort of a foundation upon which to build a science. Colloid chemistry can hardly be called an exact science until it can offer similar quantitative measurements and