were vitally interested the story of his connection with it might have been different. As it was Ohio saw adjoining states rapidly developing their mineral resources as the result of geological surveys while her own organization seemed to be producing only beautifully illustrated volumes concerning fossils.

There are enough sins legitimately left at the door of state and national legislatures, in connection with their dealings with science, without adding to their number the failures and mistakes which should really be charged to men of science themselves.

T. C. MENDENHALL

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NOVEMBER 7, 1922

THE COLLOIDAL STATE

EDITOR OF SCIENCE: It seems that one important basis of the anomalous behavior of matter in the colloidal state of subdivision lies in the fact that, in the colloidal zone, increase in dispersion is accompanied by a disproportionately large increase in kinetic activity of the ultramicrons, which reaches an extreme at atomic or molecular dispersion. The speed of motion of ultramicrons is itself the resultant of several factors (including size, temperature, viscosity of dispersion medium, concentration, free electronic fields, etc.), but it probably exercises a very considerable influence in reactions where colloids are involved, *e.g.*, diffusion, adsorption, enzyme action, etc.

For some time I have been accumulating data bearing on this question, and would be pleased to hear from any readers of SCIENCE who know of pertinent experimental facts. Thus Zsigmondy ("Colloids and the Ultramicroscope") has given the size of certain gold ultramicrons and their relative amplitudes of motion. Ultramicrospic examination indicates that gel formation involves aggregation with cessation of visible kinetic activity, and the zone of maximum degree of colloidality (J. Alexander, *J. Am. Chem. Soc.*, 43, p. 434, 1921) may be that zone where the curve of free surface plotted against particle size, approaches and crosses the curve of kinetic motion plotted against particle size.

An investigation will also be made of the variations in size of ultramicrons and ultramicroscopic activity with changes in free acidity (H-ion cencentration or p_H value).

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NOVEMBER 13, 1922

NOTE ON THE FUSARIUM WILT DISEASE OF BANANAS

IN the journal, *Phytopathology,* of September, 1919[1], Dr. E. W. Brandes described in detail his out-door pot inoculation experiment, demonstrating that *Fusarium Cubense,* E. F. Smith is the cause of the very destructive wilt disease of the banana, heretofore generally known as the Panama disease. Since then there has been published in Java a paper by E. Gaumamm on a vascular disease of the banana[2], in which the author attempts to discredit the work of American investigators of this disease, but particularly that of Dr. Brandes. In a statement by Brandes, of which the writer has a typewritten copy, he reviews Gaumamm's paper and points out various errors and confusion of facts. As the writer, while connected with the United Fruit Company, recently conducted an experiment of exactly the same kind as the one by Brandes above mentioned, it may be important to those interested to briefly describe this experiment and the results. The experiment was made just outside the Company laboratory, in Changuinola, state of Bocas del Toro, Panama. In this case the common Gros Michel banana was employed, instead of the variety Chamalucco employed by Brandes. Otherwise the two experiments were almost perfectly parallel except as to locality.

This experiment was begun November 1, 1921. Twenty-five cement pots were employed, set in corresponding holes in the ground, and

[1] Brandes, E. W., Banana Wilt. *Phytopath. 9.* No. 9, pp. 339-389, pl. 22-34, 1919.

[2] Gaumamm, E., Over een bactericele Vatbundelziekte der bananen in Nederlandsch., Indie. Meded. V. H. Instituut V. Plantenziekten, No. 48, Dept. N. Landbouw, Nijverheid en Handel, pp. 135, pl. 8, 1921.

the excavated soil afterward returned. They were square, 3 feet each way at top, 4 feet deep, and open at bottom. Sterilizing the soil was done by a Company railway engine, the soil in each pot being steamed two hours, at 110° C. Fourteen pots were thus sterilized and the remaining six were neither sterilized nor inoculated. All the pots were planted with one "bit" of a banana tuber having two "eyes" and in seven of those sterilized these bits were inoculated with a laboratory culture of *Fusarium Cubense,* while the other seven were not inoculated. The inoculum was a combination of two kinds of culture-mixed at time of application—one in corn meal decoction and the other in Ushchinski's solution, both originating from rice tube cultures, three weeks previously. It was applied in quantity of about one liter to each pot. Already in February, 1922, one of the inoculated plants showed signs of disease. By April 1 every one of the inoculated plants was diseased and most of them were even then bad cases. Up to July 12, when the writer left Panama, no one of the plants in the inoculated pots, either sterilized or unsterilized, gave any indication of disease. Besides the added interest that may be attached to this experiment, with a different variety of banana in a different locality, the writer is glad, and others will be, that it confirms the painstaking work of Dr. Brandes. It should be added that Dr. J. R. Johnston, director of tropical research for the United Fruit Company proposed the experiment, in which the writer was also supported and encouraged by the manager, H. S. Blair, and by H. L. Peck, E. C. Adams, and other men of the Company.

MARK ALFRED CARLETON
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FRESH WATER COELENTERATA IN KENTUCKY

IN 1916[1] the writer called attention to an extraordinary appearance of the rare fresh-water medusa, *Craspedacusta sowerbyi,* in a Kentucky creek, when it was present literally by the thousands, and expressed his intention to make a search for the hydroid stage of the jellyfish, since the indications were that where so many of the sexual form occurred there should be a good prospect of finding the asexual stage. With this in view visits have been made from time to time to the place where the medusæ were found. In 1917, a year after they were first observed, they were present again in as great numbers as in the preceding year[2]; still no trace of a hydroid condition could be found. Each year thereafter the place was searched, but they have not been seen since 1917. It may be of interest to record, however, that this year (September 26) when examining the locality, some fine growths of the hydroid *Cordylophora*[3] were obtained in the part of the stream where *Craspedacusta* was discovered. There can be no doubt about this material representing *Cordylophora lacustris,* and this interesting fresh-water hydroid is thus given a new locality in which it is associated in a way with *Craspedacusta.* The growths are attached to living willow twigs that by the drooping of branches have become immersed in the water.

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AN ANNOUNCEMENT IN SCIENCE

TO THE EDITOR OF SCIENCE: I am glad to be able to inform you that in response to my appeal on behalf of Professor W. Boldyreff, published in SCIENCE of October 27 under the heading, "An Opportunity," I received promptly a number of requests for special information concerning Dr. Boldyreff's qualifications, and that as a result of these inquiries he has now received an appointment for a year in a dignified position which will give him excellent opportunity for research work and an income to keep himself and family alive.

VERNON KELLOGG
NATIONAL RESEARCH COUNCIL,
WASHINGTON, D. C.,
NOVEMBER 28, 1922

[1] SCIENCE, Vol. XLIV, page 858.

[2] Professor Hargitt in commenting on the matter (SCIENCE, L. 1919, page 413) was wrong in inferring that they disappeared at once.

[3] A medusa stage is believed not to be produced by this hydroid.