sea bottom, may not the edaphic factor help to explain the observed distribution, particularly since the dark Mississippian limestones of Utah and Montana are notably unlike the contemporaneous rocks of Iowa?

The lack of evidence on debatable points throughout the paper is a constant source of disappointment to the reader. Thus on page 454 it would be interesting to know what leads the author to suggest central California as the site of an inlet from the Pacific Ocean rather than some other part of the coast. The Paleozoic rocks are so highly metamorphosed or so deeply buried from Mexico to Alaska that only here and there (as in northern California and Oregon) are they clearly recognizable, and to the average geologist there seems to be no ground for choosing any particular spot for the purpose indicated. This deficiency is probably one which the author could not easily prevent. It is to be remembered that the subject is over-large to cover adequately in so brief a space. It may be hoped that Mr. Schuchert will soon find time to prepare a volume or volumes under the same heading, in which he will give the desired facts which support his views.

Two things will tend to detract from the confidence with which this important and otherwise impressive paper will be received by geologists in general. One is the nonchalant way in which questions of a complex nature are dismissed as if they were matters of established belief. For example, on page 490 one finds the implication that the origin of dolomite is a matter of common knowledge whereas it is still an unsolved riddle to keen students of the subject. Again on page 447 is the statement, "Oolites are formed in the littoral region of seas between tides. . . ." This may explain some oolites, but several other explanations have been offered and it can not be truthfully said that the subject of the origin of oolites is yet understood.

The second and more serious defect is the assertive and dogmatic form in which many a debatable matter is presented. Examples of this are abundant throughout the paper, but the following will illustrate: (page 453) "Its syncline (Rocky Mountain sea) was due to thrusting of the Pacific mass. . . ." There is still much difference of opinion among the best students of the subject as to just what causes the warping of land surfaces. (Page 459) "Throughout the Paleozoic the northern Atlantic waters were separated from the southern Atlantic by the great continent Gondwana, uniting Africa and South America across the medial region of the present Atlantic. It is, therefore, not correct to speak of the northern Atlantic until the present form of this ocean has been attained. . . ." The existence of the Afro-American land bridge, although indicated by a considerable mass of evidence, is denied by many whose opinions are worth considering. (Page 495) "There was no Cordilleran sea of this time" (late Mississippian). In this case the unequivocal assertion of the author can be as positively refuted since a rich Kaskaskia fauna was discovered last year in the Wasatch Mountains of Utah.

In conclusion, and after offering these criticisms, the reviewer desires to repeat that the paper is a storehouse of information and a large contribution to the subject—the fruit of many years of careful study by a man well qualified as a paleontologist and blessed with unusual opportunities in the way of facilities and associations. Even so soon after its appearance it is plain that the paper is stimulating interest in the relatively new and still plastic science of paleogeography, in which much must be accomplished before firm foundations can be reached.

Eliot Blackwelder
University of Wisconsin,
April 25, 1910

SPECIAL ARTICLES

Webber's "brown fungus" of the citrus whitefly (*Ægerita webberi* n. sp.)

H. J. Webber discovered this fungus in 1896 growing parasitically upon the citrus whitefly at Manatee, Fla. He described in detail the sterile form of the fungus.[1] This

[1] U. S. Dept. of Agr., Div. of Veg. Phys. and Path., Bul. 13, 27–30, 1897.

fungus when it first develops on the under side of an orange leaf in larvæ of the white-fly, forms a chocolate-brown (Saccardo's color chart, No. 10) stroma, which somewhat resembles the citrus red scale, *Chrysomphalus aonidum*. From the margins of this stroma there extend colorless thick-walled hyphae. This stage of the fungus is sterile, and in this condition it was described by Webber under the name of "Brown fungus."

In the later development of the fungus (usually in the summer or fall) it sends out long, straight, colorless hyphæ, which grow, not only over the under surface of the leaf, but around the edges and upon the upper surface. On the upper surface of the leaves, upon short lateral branches of these hyphæ, are borne aggregations of cells, which seem to be characteristic sporodochia of the genus-form *Ægerita*. These sporodochia are 60 to 90 microns in diameter, and are more or less spherical clusters of inflated oval cells, 12 to 18 microns in diameter. From near the place of attachment of the sporodochium there radiate 3 to 5 hypha-like appendages, 150 to 200 microns long by 6 to 8 microns wide, one to three septate. This entire aggregation of spherical cells and appendages remains in unison, and functions as a spore. When abundant, these sporodochia present to the eye the appearance of a reddish-brown dust over the upper surface of the leaves. If the lower side of a leaf bearing brown fungous stromata happens to be turned upward for some time, the sporodochia will develop abundantly there. These sporodochia were first noticed in the fall of 1905, accompanying the "brown fungus"; but only recently has the connection between the two been proved. Their supposed connection was touched upon in 1908.[2]

These sporodochia are curious and interesting. When once detached from the leaf, they blow about on smooth surfaces at the least motion of the air, but on alighting upon another leaf or fairly rough paper, they tend to hold fast to it.

[2] "Fungi Parasitic upon *Aleyrodes citri*," Univ. of Fla., Special Studies, No. 1, p. 36.

When germinated in hanging-drop cultures these sporodochia produce hyphæ identical with those of Webber's "brown fungus." When the sporodochia are placed upon the larvæ of *Aleyrodes citri*, typical stromata of the "brown fungus" arise. During the summer and fall of 1909, sporodochia were carefully picked off under a compound microscope. A camel's hair brush, moistened with water containing these sporodochia, was drawn over live whitefly larvæ. Nine days after, the first and second stage larvæ began to show the effects of fungous infection. In sixteen days, initial stages of the stromata were evident bursting through the edges of the larvæ. At a later date, the typical brown stromata were formed, and in three months *Ægerita* sporodochia were produced by the surface hyphæ on the upper sides of the leaves.

The economic importance of this fungus makes it desirable that it should have a scientific name. The form of the sporodochium most nearly resembles that of the provisional genus *Ægerita*. The fungus was referred to Dr. Roland Thaxter, of Harvard University, who kindly examined it, and confirmed the view that it might well be placed under the name of *Ægerita* until the perfect stage was found. It is therefore proposed to designate Webber's 'brown fungus" as *Ægerita webberi* n. sp. The form and appearance of the hyphæ suggest relationships to the Hypochnaceæ of the basidiomycetous fungi.

H. S. FAWCETT

A CORRECTED CLASSIFICATION OF THE EDENTATES

IN a recent paper[1] the writer was led, from a consideration of various anatomical characters, to the recognition of the Edentata as a *superorder* of mammals comprising four distinct *orders*, as follows:

SUPERORDER EDENTATA (Vicq d'Azyr).
Order 1. TÆNIODONTA Cope.
Order 2. XENARTHRA Gill.

[1] "A Suggested Classification of Edentates," State University of Oklahoma, Research Bulletin, No. 2, 1909.