much that is new and is a valuable contribution to the difficult subject of the interrelationship of several Palæozoic plants exhibiting remarkable complex anatomical features.

A. C. Seward

University of Cambridge

SPECIAL ARTICLES

THE BLACK CHAFF OF WHEAT

The continued prevalence of black chaff of wheat in the United States makes it desirable to have a Latin-scientific name for the bacterial organism causing it. This organism resembles *Bacterium translucens* (see *Journal of Agricultural Research,* Vol. XI., p. 625, 1917), cause of the bacterial blight of barley. In cross inoculations on the leaves of seedling plants the barley organism on wheat has proved either non-infectious or has produced small non-typical lesions. On the other hand, inoculation experiments have shown that the wheat organism is practically as pathogenic on barley as it is on wheat and the lesions so produced on barley are indistinguishable from those produced by the barley organism itself. There also appear to be minor cultural differences. It is suggested, therefore, that for the present, at least, the wheat organism be distinguished as *Bacterium translucens* var. undulosum with, in general, the characteristics already given for the species:

Var. undulosum nov. var., cause of the black chaff disease of wheat, produces yellow or translucent stripes on leaves, water-soaked or black stripes on culms, and longitudinal, more or less sunken, dark stripes or spots on the glumes. In moist weather the bacteria often ooze to the surface of the diseased spots or stripes as tiny beads or drops, drying yellowish. From sections of diseased leaves or glumes mounted in water they ooze in enormous numbers (like smoke out of a chimney) making the fluid cloudy. This organism attacks also the kernels, especially at the base causing them to be shrunken and honeycombed with bacterial pockets, but even when the kernels are not attacked their surface is liable to be infected from the diseased glumes. When the disease appears early and is severe the heads are dwarfed. Surface colonies on thin-sown agar plates are circular, pale yellow, smooth (like polished glass) and structureless on the surface, usually homogeneous also by direct transmitted light, but by oblique transmitted light (half-light) the interior is seen to be full of minute waves or interblending striations which persist, and which are best seen with a hand lens. It can be distinguished easily and quickly from accompanying non-parasitic yellow forms by this character alone. Slime copious and very pale yellow on potato agar; on whey agar very copious and bright chrome yellow—slime on this medium deeper yellow and less fluid than that of the barley organism.

Infections have been obtained repeatedly on wheat leaves and glumes. The disease is transmitted to young seedlings by way of the wheat kernels. It occurs in all the wheat states of the Middle West.

For earlier notes consult Science, N. S., Vol. XLIV., No. 1134, p. 432, 1916, the *Journal of Agricultural Research,* Vol. X., No. 1, 1917, and the *Plant Disease Bulletin* (issued by The Plant Disease Survey, Bureau of Plant Industry, U. S. Department of Agriculture), Vol. I., No. 2, 1917, and Vol. II., No. 6, 1918.

Erwin F. Smith,
L. R. Jones,
C. S. Reddy

THE BUFFALO MEETING OF THE AMERICAN CHEMICAL SOCIETY. V

The rapid determination of titanium in titaniferous iron ores: John Waddell. The ore is fused in a silver, copper or iron crucible with sodium peroxide, for about ten minutes. The crucible with the fused mass is brought into a beaker with water, and the disintegrated material dissolved in sulphuric acid. Tartaric acid is added to keep the titanium in solution. Sulphuretted hydrogen is passed through the solution. If a copper or silver crucible has been used, the precipitated sulphide is filtered off, and to the filtrate, ammonia is added and more sulphuretted hydrogen is passed. To the filtrate from the iron sulphide, sulphuric acid is added and the solution is boiled to drive off the