would have converted into a permanent forest. A neglect of this attention resulted in the complete failure of the project.—GEO. D. FULLER.

Nitrogen relations of semi-arid soils.—MCBETH[42] finds that semi-arid soils fail to nitrify dried blood when it is added in 1 per cent quantities. Under the conditions ammonia accumulates in the soil and 50 per cent of the nitrogen may be lost to the air (probably as ammonia) within 6 weeks. When added at ordinary fertilizer rates nitrification is complete. With green manures, especially legumes, nitrification is rapid. Fifty per cent of the nitrogen of the green manure is transformed to nitrates in 30 days. Furrow irrigation leads to the accumulation of the larger part of the nitrate in the surface 6 inches of the soil, and this often results in niter spots. Overhead or basin irrigation gives far better results. Mottled orange leaves show higher water content than checks, and extreme mottling is often, yet not invariably, associated with high nitrate content.—WM. CROCKER.

Effect of dust on photosynthesis.—The effect of surface films and dusts on physiological processes in plants has aroused considerable interest in recent years. California citrus vegetation in the neighborhood of cement works becomes covered with cement dust. Since the dry season lasts several months, the dust remains on the leaves for long periods. YOUNG[43] took advantage of this fact to determine the effect of dusts on carbohydrate synthesis. He found that the cement dust in some cases shuts out as much as 80 per cent of the light from the upper surface of the leaf, but this high exclusion of light did not interfere with carbohydrate synthesis. This work bears out in a practical and interesting way that of BROWN and ESCOMBE in showing the small amount of light that is really necessary for carbohydrate synthesis.—CHAS. O. APPLEMAN.

Nitrogen fixation.—The question of nitrogen fixation by filamentous fungi has been investigated by DUGGAR and DAVIS[44] with reference to *Aspergillus niger*, *Macrosporium commune*, *Penicillium digitatum*, *P. expansum*, *Glomerella Gossypii*, and *Phoma Betae*. Of these, *Phoma Betae* was the only form which was definitely shown to be capable of fixing free nitrogen. The quantities fixed by this fungus varied from 3.022 to 7.752 mg. per culture of 50 cc. of solution when sugar beet or mangel decoction with added sugar were used as culture media. The authors give a critical review of all the available literature on the subject, and in their own work exercised every precaution to avoid the errors and faulty methods which have led to the numerous conflicting results in the investigations of this problem.—H. HASSELBRING.

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