sion of the organic matter of a soil into nitrates is the result of the life functions of two organisms—the one a purely nitrous ferment, *i.e.*, capable only of oxidizing ammonia and nitrogenous humus to nitrites and not to the fully oxidized form of nitrates, the other, known as the nitrite ferment, whose function it is to convert nitrites into nitrates. This nitric organism completes the useful work of nitrification. By an immence amount of bacteriological study Mr. Warington at last succeeded in isolating, growing and photographing this highly interesting plant. He says, "in soil, both organisms are present in enormous numbers and the action of both organisms proceeds together as the conditions are favourable to both." *Denitrification* or the destruction of nitrates takes place in water-logged soils from which the air is necessarily excluded. This is brought about through the agency of a third living organism, and the conditions most favourable for its development are an absence of oxygen, and an abundant supply of readily oxidizable organic matter. The practical lesson from this conclusion is the necessity of well-drained land, in order that the surplus water may be carried off and the air allowed to freely permeate the soil.

The nitrates are developed in the upper layers of a soil, but being extremely soluble are washed down by heavy rains to the subsoil. Ploughed land, well drained, loses nitrates when not cropped, and more so especially in wet seasons. Bare fallow does not, therefore, entail an unmixed good. In this connection Mr. Warington says, "If a farmer could ensure dry seasons, so that the nitrates produced by a bare fallow should remain in the soil available for the succeeding crop, it would pay him better to have an alternation of wheat and bare fallow rather than to grow wheat continuously. However, in the English climate no such favourable results can be expected," as the results of 30 years' experience at Rothamsted have shown that "wheat after fallow, except in some of the earliest years, has not given the double produce which should result from the presence of a double supply of nitrates." By a system of drain gauges Mr. Warington has been able to measure this loss of nitrates. He says, "The average quantity of nitrogen as nitrate discharged from the soil during thirteen years has been for the 20-inch gauge 37.3 lbs, for the 40-inch gauge 32.6 lbs., and for the 60-inch