fairly safe to say that nitrate nitrogen accumulated from organic materials practically in proportion to the amount of water soluble nitrogen contained.

The rapidity with which nitrate nitrogen accumulates in soil is the best single measurement for the productivity of that soil. In making controlled experiments it is the common practice to add to soil some nitrogenous fertilizer such as sulphate of ammonia, keep the soil at favorable moisture and temperature for a time, and then determine the amount of nitrate in the soil. In the tables, summaries of experiments in which nitrate accumulation was studied are given. This accumulation is stated as a percent of the original nitrogen added to the soil. The important thing in all tables except the last is the time factor. Several things in these tables may be mentioned as outstanding.

First, the acidity of soil 2 (Massachusetts) had definitely prevented the accumulation of nitrate nitrogen without lime added. Even when liquid ammonia was added the neutralizing effect was not enough to induce the accumulation of nitrates. The lime added with sulphate of ammonia was thoroughly mixed with the soil, yet in spite of this mixing nitrates did not accumulate for some time. How much longer would it require for lime, applied as a top-dressing and inadequately mixed with the soil, to give a response in terms of nitrates produced?

Second, manure should be considered as typical of the materials with a low nitrogen and high carbon content. The behavior as regards nitrate accumulation is also typical. Very little nitrates are produced, or at least accumulated, and if plants were growing on the soil they would undoubtedly suffer from lack of nitrogen. Garbage tankage behaves similarly. Other tests have shown that the nitrogen availability in garbage tankage is very low.

Third, the effect of too much water in soil in the experiment by Baer is plainly evident. The 38% water content is probably higher than most soils can carry under playing conditions. No doubt the available nitrogen in many greens is lost because of poor drainage, and occasionally because of over-watering. Even when nitrates are added to the soil as nitrate of soda or similar material, the nitrates disappear under the influence of too much water.

Illustrated Lecture on Turf Diseases

By JOHN MONTIETH, JR.
USGA Green Section

DR. JOHN MONTEITH, JR., USGA Green Section, presented an illustrated lecture on turf diseases that was especially helpful because of the clear, colored slides with which this noted expert brought out vivid details of his remarks.

He identified turf diseases as being of two types: (1) caused by invasion of disease organism, and (2) caused by other conditions affecting growth of the plant. The principal cause of disease in humans is bacteria; in plants, fungi. Dr. Monteith showed a vastly enlarged cross-section of a blade of grass and pointed out how diseases hit the cells of grass. Other enlarged cross-sections showed progress of fungus penetrating grass through pores in the blades. He went into this in detail to explain how extensive microscopic investigations had confirmed the fungus theory of brown-patch.

Monteith counseled his hearers to be extremely careful when diagnosing grass diseases, saying that especially during the troubles of last year greenkeepers were apt to make the mistake of treating for diseases that didn't exist. He showed pictures of disease organisms growing in cultures and went to pains to show his practical audience how the scientists let nature confirm or damn the theories.

Pictures of plots on which mercury treatments were tested were shown and many interesting developments of the patient, extensive work done by the turf scientists in attempting to aid the men in the field were put on the screen.

Comment was made on slides showing effect of lime and air current in preventing brown-patch.

In discussing pythium, Monteith emphasized that the disease develops most at high temperature, hence the prevalence of that trouble during 1931.

Showing slides of snow-mold, the USGA scientist warned that the mild winter might be responsible for severe attacks of this disease. Late growth of grass and lack of freezing, followed by sudden cold weather and snow, makes a perfect setting for development of snow-mold, he stated. Bichloride of mercury and calomel treatments have demonstrated effectiveness against this disease. He presented slides of leaf spot and expressed regret that no satisfactory treatment for leaf spot had been discovered.

Slides of fairy ring, ring spot, mildew, smut, chemical burns and scald also were shown. Fairy ring cure was requested by several at the conference and Monteith said that although definite cases of fairy ring had been under observation for many years no certain cure had been discovered.