was found to give much more concordant results upon soils high in humus, and upon those low in humus there was a slight improvement over the Grandeau method.

Sixth, The authors see no reason for assuming that the phosphoric acid extracted by the ammonia is in any way associated with the humus, for Mr. Huston has already shown that the phosphoric acid is readily dissolved by ammonia from phosphate of alumina and iron. It is generally considered that there are bases with which the available phosphoric acid in the soil is combined. In the same way we may account for the presence of potash and lime in solution by the ordinary laws which govern the absorption of bases by zeolitic minerals in the soil.

While humates also take part in soil absorption, it is not necessary or even altogether reasonable to consider all the bases removed by ammonia were associated with the humus. In fact, the theory of the process is that the bases associated with the humus had already been removed by means of the hydrochloric acid used in the preliminary washing of the soil.

The paper is in the nature of a preliminary report and the work is still in progress. A complete report of the work will be published later.

THE EXTRACTION OF XYLAN FROM STRAW IN THE MANUFACTURE OF PAPER.

By W. E. STONE AND W. H. TEST.

[ABSTRACT.]

The extraction of substances from straw which on inversion, yield a pentose sugar, has been established. In the process of making straw paper the straw is boiled with a strong solution of quick lime. This liquor, when acidulated and treated with an excess of alcohol throws down a precipitate of pentosans. It seemed, therefore, a good material for the preparation of xylose.

The liquor is yellowish brown in color and alkaline. Specific gravity, 1.215; alkaline equivalent, 2 to 2.5 per cent. calcium oxide. Total residue on evaporation, 3.95 per cent., of which 30.77 per cent. was mineral and 69.23 per cent. organic in nature. Thirty-two liters of the liquor yielded on precipitation with alcohol, 300 grams of xylan. This, on distillation with hydrochloric acid, yielded 45.5 to 47.1 per cent. furfurol. This could not be inverted by methods similar to those practiced by Wohl on inuline. The ordinary method of boiling with 2 per cent.

sulfuric acid was resorted to. Thirty-five grams of crystallized sugar were obtained, which were identified as xylose.

The multirotation of xylose, as observed by Tollens, was confirmed. The initial rotation, five minutes after solution, was 71.65°, which became constant at 18.40° after ten hours.

On the determination of chlorine in natural waters. By W. A. Noyes.

[Abstract.]

American waters, apparently, contain much smaller amounts of chlorine than most natural waters in England. The methods of direct titration with silver nitrate and potassium chromate as advised by Wanklyn and Frankland give too high results, and sometimes two or three times as much chlorine as is actually present, in the case of waters low in chlorine. When 250 cc. of the water were concentrated to about 25 cc. and filtered, the titration with $\frac{1}{100}$ normal silver nitrate, using potassium chromate as an indicator, gave results agreeing with the gravimetric determination within $\frac{1}{100}$ part per million in the case of a water containing but four parts per million of chlorine.

Thiofurfurol and its condensation products. By W. E. Stone and Clinton Dickson.

[Abstract.]

Thiofurfurol is made by the action of hydrogen sulphide on an alcoholic solution of furfuramid. It is characterized by its disagreeable odor. It is a white powder, melting at 117° and containing about 29 per cent. of sulphur, corresponding to the formula $C_5 H_4 OS$. On heating strongly vapors are given off which, on condensation, leave beautiful fibrous crystals, which are not easily acted upon, probably a condensation product. If the thiofurfurol be heated with an excess of fine copper at a temperature below the boiling point of water decomposition takes place. On extracting the mass with ether and evaporating, there remains a tarry mass which yields compact crystals which melt at 149°, contain no sulphur and are probably also a condensation product. The subject will be investigated further.

Determination of valences. By P. S. Baker. Published in DePauw Bulletin.