in our laboratories. The water which falls to the earth is also quite another kind of water from that which the chemist uses; it not alone assumes power by its fall, it is also freshly impregnated with the constituents of the atmosphere: carbonic acid, oxygen and ammonia, substances which very much aid, either directly or indirectly, in dissolving the nourishing ingredients of soils. The water of which the chemist can dispose has lost already most of these substances, and, when boiled, even loses them entirely. Besides, we know that the better the adaptation of a soil for the purpose of cultivation, so much the longer will it retain its nourishing ingredients, and proportionably resist their loss by the action of water. A really good soil may therefore, mutatis mutandis, yield less quantities of nourishing substances to water, than one of an inferior quality.

Water acts principally as an acid and, most especially when impregnated with carbonic acid and oxygen, as is the case with rain-water. The best way to imitate nature when extracting from soils their nutrient ingredients, seems therefore to remedy the deficiencies of pure water by the addition of an acid, and this is the method which we have adopted.

Determination of Phosphoric Acid.

Of the different methods of the determination of Phosphoric Acid, that by which Phosphoric Acid is detected by molybdate of ammonia, is distinguished, as the most advantageous for application to soils, furnishing indisputably the most exact results of all, and requiring besides little skill, and the least time.

As to the preparation of the molybdate of ammonia, it is most commonly made from the natural Sulphuret of molybdenum. This is to be pulverized, or on account of its toughness ground to powder and then, whilst being exposed to the air, heated and constantly stirred; Sulphurous acid will then escape, and molybdic acid be left behind. To prevent the melting, or the escaping of the latter, the heat must be moderate, most especially towards the end of the process. The residue is digested for some time with ammonia, which dissolves the molybdic acid, whilst undecomposed sulphuret of molybdenum, quartz and other substances remain. The filtrate evaporated, and if necessary, once more filtrated, then boiled and mixed, whilst yet hot, with strong ammonia, will, by cooling, leave crystals of molybdate of ammonia.

A concentrated solution of these crystals in water furnishes the above mentioned re-agent.

The effect of molybdate of ammonia on phosphoric acid and its salts, in a solution which has been acidulated by nitric acid, manifests itself, first, in the forming of a white precipitate of molybdic acid, which is re-dissolved, however, in the excess of the nitric