tack further the organic matter both for their nitrogen and, what is yet more important, for their carbon supply, thus liberating the nitrogen in the form of ammonia from the organic matter, which otherwise would be decomposed very slowly. The amounts of carbohydrate added should not be very large, otherwise the microörganisms will merely live on that source of energy, breaking up only as much of the organic matter in the soil as is needed for their nitrogen metabolism. The higher plants would in that case only lose from the addition of carbohydrates, since the microorganisms would compete with them for the available plant food in the soil and would become injurious instead of beneficial. It would appear that microörganisms will only attack the complex protein molecule, thus liberating nitrogen in a form utilizable by higher plants, when they are actually in a condition of starvation for lack of available carbohydrates.

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NOTES.

On the Use of Large Glass-stoppered Containers in Autoclaving.—There are a large number of reactions usually carried out under pressure in sealed glass tubes. The small capacity of such tubes makes their employment for the production of larger quantities of materials costly and laborious, and one usually turns to the use of a glass enameled autoclave.

Any process in which it is necessary to heat under pressure liquids and solids in quantity may be carried out in an iron autoclave according to the following scheme: The material to be heated under pressure is placed in a glass bottle with a ground stopper. The clean, dry stopper is carefully twisted tightly into the neck of the bottle and fastened securely by a clamp of suitable design. The bottle is placed in the autoclave which is half filled with water and the apparatus then closed and heated to the desired temperature. Bottles used in this way have stood gage pressures of 5000 lbs. per sq. in., when heated in a specially designed autoclave. It is obvious that under proper conditions the internal and external pressures on the bottle are practically equal.

The autoclave constructed for us, has a maximum working pressure of 10,000 lbs. per sq. in. with a 50% factor of safety. The body of the autoclave was drop-forged from one piece of armor-plate steel and then machined.

The dimensions are as follows: Thickness of metal at all points is 2″. Inside it is 10″ in diameter and 18″ deep. Outside its diameter is 20.5″ and its height is 20″. The flange is 5″ wide. The lid is secured

by 13 × 1″ bolts spaced equally. The safety valve is of the ground seat type. All fittings are extra heavy $^3/_8$″ pipe. The gasket of $^1/_4$″ lead, whose diameters are 11″ inside and 14″ outside. The body is supported by a steel shell 36″ high, and heated by an atmospheric gas burner.

It is located in a concrete room 10′ × 15′ × 12′, the walls of which are approximately 20″ thick. This unit has been operated intermittently for about three years without mechanical difficulties.

The method has been used for the preparation of ethylene diamine from ethylene chloride and ammonia, the condensation of ethylene diamine and cantharidin, and the transposition of hydroxy R-salt to amine R-salt.

Perhaps the most interesting example involving acid conditions is the formation of diamine acridine from tetra-amine diphenyl-methane, a step in the preparation of the disinfectant flavine. About 258 g. *p,p*-diamino *o,o*-dinitro diphenyl methane are treated with 1024 g. hydrochloric acid and 232 g. of granulated tin in a porcelain dish on the steam bath. After reduction, the solution (1280 cc.) is placed in a five-liter glass-stoppered bottle and the stopper clamped on. This is placed in the iron autoclave of about 15 liters' capacity half filled with water. The closed autoclave is heated to 135° for four hours. On cooling the bottle is opened, there being no pressure within. The diamino acridine crystallizes out in the bottle and is filtered off.

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A New Bromine Method for the Determination of Thymol, Salicylates and Similar Compounds.—Under this title A. Seidell[1] has described a modification of the bromate method of estimating the hydrobromic acid formed in the reaction, instead of measuring the amount of bromine as, he says, had hitherto been exclusively done. Not only this method but also a method for the determination of hydrobromic acid had already been published[2] in connection with a study of the properties and determination of salicylic acid. In this second method free bromine was removed by adding potassium iodide and titrating with thiosulfate. On adding potassium iodate the titration was completed using more thiosulfate. With regard to certain publications in which other parts of my work have been overlooked it may seem suitable to call the attention of those interested to this same article.

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[1] *Am. Chem. J.*, 47, 508–520 (1912).

[2] *Rec. trav. chim.*, [2] 7, 211 (1888).