and the requisite quantity of bone black has been added, for 3,300 pounds original starch mixture, 15 pounds of an aqueous solution of sulphurous acid is poured in, and the whole well agitated; to assist the escape of the acid fumes, an ounce of crystallized soda, dissolved in a pint of water, is added for every pound of acid.

Where it is desired to make sugar instead of syrup, the proportions of acid to be employed are different, 45 pounds of sulphuric acid and 6 pounds of nitric acid being taken to reduce the 3,300 pounds of starch. Before the use of nitric acid was discovered, the boiling required four hours; it can now be accomplished in less than two hours. After boiling three-quarters of an hour, it is well to begin the iodine tests, and after it is ripe for syrup, to continue the operation some time longer, until, on cooling, sugar will readily crystallize. It is one thing to make syrup, and another to produce sugar, the proportions of acid and the time being different in each case.

After shutting off the steam and suspending the boiling, 15 pounds of bone black must be strewn in, and the liquid set to boil for five minutes. It is then ready to run into the neutralizing vats.

After neutralization, 30 pounds of bone black must be added, under constant agitation, and 15 pounds sulphurous acid and 1 pound crystallized soda, as before, and the whole left 6 to 8 hours to settle. The clear sweet liquid can be introduced into the vacuum apparatus for concentration. It can be boiled down in open vessels by steam, but is not so white and pure as when the vacuum pan is employed. As soon as the syrup shows 36°, it is filtered, and run into suitable crystallizing vessels. On the filter will be collected the gypsum produced by the neutralization; and as it contains considerable sugar, it must be pressed out and washed. In Germany, the filter consists of strong cloth placed inside of a conical basket, fitted to a suitable barrel. The liquid runs through perfectly clear, and requires three or four days for its crystallization; to hasten the crystallization, some farina sugar can be stirred in. When nearly dry, it is poured into boxes of a suitable size for transportation. The solid grape sugar is extensively employed in breweries, in the manufacture of wines, for distillation, and in candy. The price of the sugar is higher than for syrup, and it is not liable to deteriorate, if it be properly prepared.

The form of the boiler has been considerably modified. Instead of performing the reduction by steam under pressure, a coil of copper pipe, in the bottom of the wooden vessels, serves to convey the heat for boiling the mixture. The dilution of the liquid by the condensation of the steam in the vat, and the necessity of boilers that could resist several atmospheres of pressure, are avoided. There is also less liability to explosion. The employment of nitric acid is a new feature, and the use of sulphurous acid, for the double purpose of bleaching the syrup and preventing fermentation, ought not to be overlooked.

Pure starch syrup resembles honey so closely that few could detect any difference. It is fast becoming a substitute for molasses and syrup from cane, and as the syrup resulting from the best root sugar is only suited to fermentation and the recovery of potash, the starch syrup must fast grow in favor.

Grape sugar can also be made from shavings, rags, saw-dust and any kind of cellulose, but the cheapest material is the starch from corn and grain. To insure a good quality, attention must be paid to removing all traces of the lime and soda used in neutralizing, and to a proper bleaching by bone black and sulphurous acid. With these precautions, and by aid of improved machinery, there is no reason why the industry should not be made a profitable one to all who are disposed to invest in it.—*Scientific American.*

The Comparative Efficacy of Antiseptics.

Dr. F. Crace Calvert has performed two series of experiments in order to ascertain the comparative powers of various substances ordinarily used as antiseptics. The first consisted in placing in bottles (not corked) solution of albumen and flour-paste. To these he added various proportions of some of the substances patronized at the present time as antiseptics, and the following table shows the time in which an offensive odor became sensible at a temperature from 70 to 80 degrees F.:

Antiseptic employed.	P c. of antiseptic.	Albumen.	Flour paste.
M'Dougall's disinfecting powder	5	11 days	25 days
Carbolic disinfecting powder...	5	Sound	Sound
Chlor-Alum (made lately).....	2	9 days	—
Chloride of zinc.....	2	15 days	—
Chloride of lime.....	5	16 days	14 days
Permanganate of potash.....	5	—	—
Tar oil	2	11 days	25 days
Carbolic acid.....	2	Sound	Sound
Cresylic acid.....	2	Sound	Sound
None.....	—	5 days	7 days

The above table he considers clearly to show that the only true antiseptics are carbolic and cresylic acids; and these results coincide with those obtained by Mr. William Crookes, F.R.S., Dr. Angus Smith, F.R.S., and Dr. Sansom. These two acids continued their action till the albumen solution and paste dried up. The second series had the object of ascertaining which of the undetermined substances is most active in destroying germs, and preserving animal substance. At the bottom of wide-mouthed pint bottles, Dr. Calvert placed a known quantity of each of the antiseptics, suspending over them by a thread a piece of sound meat; and, by daily examination, it was easily ascertained when the meat became tainted or putrid.

Antiseptic used.	Became tainted	Putrid
Permanganate of potash.....	2 days	4 days
Chlor-Alum	2 "	10 "
M'Dougall's disinfecting powder.	12 "	19 "
Chloride of lime	14 "	21 "
Tar oil	16 "	25 "
Chloride of zinc.....	19 "	—
Carbolic disinfecting powder	Did not become tainted, but dried up and became quite hard.	
Carbolic acid.....		
Cresylic acid.....		

—*British Medical Journal.*

Mace.

The mace known as a spice is the berry of the *Myristica officinalis* of Linnæus, and is indigenous to the Moluccas. It is cultivated in the Caraccas and Peru, and to a slight extent in other South American countries, but our chief supplies are derived from the island of Banda. The fruit is pyriform, of a whitish-roseate colour when ripe, becoming yellow when dried, and is but slightly succulent. It is the kernel divested of its different envelopes—the outer capsule, the membraneous pulp, and an interior skin, which loses its flavour on peeling off—which constitutes the spice. The mace is the most aromatic of all spices; the taste is hot, the flavour very expansive, comparable in this respect to cinnamon. In their preparation the kernels are steeped in sea-water, and afterwards dried. The grain is hard, very aromatic, and serves to season various condiments. In commerce we distinguish the female or cultivated mace from the male or wild mace, which latter is more coarse, less odorous, and consequently less valued. The mace is remarkable for its stimulating qualities, and on this account is largely employed in the preparation of balms. The tree is far from fertile, and approximates in general character to the orange-tree. From the tree itself a resin is extracted in South America known as *otoba*. A highly aromatic volatile oil is furnished by the distillation of the kernel, but there is also a fixed oil, retired by means of heat, but always mixed with a certain portion of volatile oil, which communicates its odour and colour. This mixed oil, of a yellow colour, inclining to red, is often designated butter of mace, owing to the numerous particles of great density which rise to the surface of the water in the course of separation. The spirituous extract is very active; the latter is less energetic.—*Grocer.*

Soluble Saccharated Oxide of Iron as an Antidote to Arsenic.

Dr. Kohler, of Halle, remarks that the long-known antidote, *hydrated oxide* of iron, has many practical inconveniences. The preparation now recommended only differs from the latter in containing a larger proportion of water (as hydrate.) Kohler used it with remarkable success in the case of a young man who had swallowed thirty or forty grains, or more, of arsenic. He comes to the following general conclusions about the new therapeutic: 1. That it precipitates arsenious acid from solution in the form of insoluble arseniate. 2. That on chemical grounds it should be justly substituted for the ordinary hydrated oxide as an antidote. 3. The experiments on animals fully bear out its practical efficacy. 4. That, while in other forms of metallic poisoning (especially with common sublimate) mechanical antidotes like albumen, etc., are useful, the latter treatment is only a hindrance to the efficient application of the oxide of iron in arsenical poisoning. 5. That the iron-treatment should *not* be accompanied by the use of neutral purgative salts, otherwise the antidotal combinations may be interfered with. 6. Since Schroff has proved that the arseniate of iron itself is always absorbed in minute quantities, emetics should be administered as soon as the antidotal combination of the iron with the arsenic may be supposed to have taken place. 7. As to the quantity of saccharated oxide of iron required to neutral-