

ing the past season some have realized as high as five hundred, seven hundred, eight hundred, and eight hundred and fifty gallons to the acre.

The success in producing wine from this grape is in some measure to be attributed to the greater length of the seasons and the character of the soil in this vicinity. It being absolutely necessary to make wine from this or any other grape, that it should reach the degree of ripeness or maturity which will furnish the requisite amount of sugar or saccharine matter to preserve the wine by its conversion into alcohol in the process of fermentation. Grapes may be considered ripe enough for eating, which would not do for wine making.

#### Substitutes for Citric and Tartaric Acids, and their Salts.

Gatty and Kopp employ lactic acid and the lactates. This acid, when used as a resist, is thickened with starch, and then printed by block or roller upon cloth, which is afterwards printed or padded with mordants. One gallon lactic acid at 40° Twaddle is used, instead of one gallon lemon-juice at 50° Twaddle. In cases where the lemon-juice is previously saturated with an alkali, the lactic acid is treated in the same manner.

When lactic acid is used as a discharge, it is thickened as in the above case, and printed upon cloth saturated with mordants, which it discharges by forming soluble salts with the oxides constituting the mordants. In using lactic acid to precipitate carthamine from the alkaline solution of safflower, 1 lbs. acid at about 10° Twaddle are used in place of 3 lbs. tartaric acid. In dyeing Prussian blue, scarlet, crimson, &c., on silk or wool, tartaric acid or cream of tartar is generally used. In such cases, lactic acid or bilactate of soda is applied, and the manipulations are the same as when tartaric acid is used, 1½ lbs. bilactate of soda at 66° Twaddle serving for 1 lb. cream of tartar. When lactic acid is employed for steam colours, it is substituted for tartaric acid in the proportions already stated, the preparations of the colours being the same as when tartaric acid is used. Lactic acid may be applied in preparing white and coloured discharges upon Turkey red and other colours: the operation is managed just as if tartaric acid were used—only, after printing, the cloth should not be exposed to a long-continued heat, which, owing to a slight volatilization of the lactic acid, would reduce its discharging properties.

Belford's process depends upon the formation of an artificial tartaric acid by mixing oxalic acid with sugar, a substance containing the exact proportion of hydrogen in which oxalic acid is deficient. A quantity of sugar or treacle is drenched with nitric acid, and with some mother-water in which oxalic acid has been crystallised. As soon as nitrous vapours cease ascending, more nitric acid is added, and the solution is then concentrated until a crystalline mass is obtained on cooling. This mass consists of slender crystalline needles, and is next washed for obtaining the acid. After washing the crystals, add sugar which has been dissolved in some of the washing liquor, the quantity of sugar required being proportional to the degree of acidity which it is desired to attain. The syrupy fluid is then concentrated at a gentle heat, and left to crystallise at a moderate temperature. Or, take one part of sugar or treacle, and add one-third acetic acid, and three parts nitric acid at 36° Twaddle. This yields an oxalic acid containing more hydrogen than the common oxalic acid. The crystals obtained from this solution are purified by washing and re-crystallisation. The oxalic acid thus obtained may be converted into tartaric acid by deoxidation. This is effected by dissolving sugar in the washing liquor and mixing with the acid. The solutions, when concentrated at a low temperature and crystallised, yield so-called "tartaric" acid. The wash liquors when concentrated may be used as mordants.

Murdock substitutes for cream of tartar, and for the mixture of cream of tartar with alum, common salt with nitric acid, and sulphate of alumina. 100 lbs. salt are mixed with 300 lbs. of water, and when dissolved, 20 lbs. nitric acid are introduced. When alum is required, 100 lbs. sulphate of alumina are gradually added. The water should be cold, and the mixture but slightly stirred.

#### Canadian Marble.

We have been favoured with some hand specimens of different varieties of marble from the quarries of Messrs. Nicholls & Co., in the township of Marmora. The marble is within two feet of the surface of the ground. The river Moira runs across the corner of the lot on which the quarry is situated, and offers available power for the requisite machinery in a marble manufactory. The distance of these quarries from Cobourg is about 50 miles, and from Belleville nearly 30 miles.

From the circumstance of their proximity to the Marmora iron works, it is probable that the distance from a port will not long continue to be a serious obstacle against the general adoption of Canadian marble for ornamental and useful purposes. It is not generally known that a large supply of very good marble can be obtained from many parts of Canada. Notices of localities where marble may be procured are interspersed throughout the Reports of the Geological Commission:—Mr. Logan says that, some beds of the Chazy limestone in the neighbourhood of Montreal are known to take a moderately good polish, and they are cut into slabs for the purpose of chimney-pieces, and occasionally for tables, one of which, manufactured by Mr. Hammond of Montreal, and sent to the London Industrial Exhibition of 1851, attracted attention, and was readily sold. The colour of these slabs is a dark grey: in some parts of the district the grey shews occasional spots of red, as on Madame Nolan's farm at Ste. Catharine, and on Isle-Bizard; but in seignory of La-Chenaye, on the Little River, about a mile from St.-Lin, massive beds of the formation become almost wholly red, and give large slabs of a very handsome aspect. The beds are composed of a mass of comminuted organic remains, consisting of shells and corals, the latter predominating, and the prevailing species being *Chelonic lycopodon*. The corals are coloured ochre-red, while some of the shells approach rather a rose-red, and parts of the stone are mottled with a greyish-red running irregularly over the surface. A large supply of this marble might easily be procured.

ON THE SEPARATION OF SILVER FROM LEAD.—At a meeting of the Royal Cornwall Polytechnic Institute, Mr. J. A. Phillips, of London (formerly of the Museum of Economic Geology), said that one of the most important improvements which had recently been made in the metallurgical art came into operation last year, and is the separation of silver from lead by means of zinc. After describing the old process of separation, and the subsequent process discovered by Mr. Pattinson, of Newcastle-on-Tyne, involving several crystallisations and a final cupellation, he stated that still more recently a patent had been taken out by Mr. Parkes for a process by which he separates the silver entirely by one operation. To do this, the alloy of silver and lead is melted in the usual way in a large iron pot; to this a small quantity, a few pounds of zinc per ton, is added, the whole mixed up and allowed to remain a short time. By this means the silver is brought to the surface in the form of alloy with the zinc, and this mixture is subsequently skimmed off and treated for the silver it contains. In order to do this, the zinc is first partially separated by oxidation, and the residual alloys afterwards treated in the cupel. In connexion with the purification of metals, he might mention some of his own experiments in regard to tin. The tin from Peru and some other countries contains a large amount of tungsten, or wolfram, which very much depreciates its value. Till recently this tin could only be employed for very common purposes, such as making tin pipes and other things which did not require tin of good quality. But in analysing some of this tin he happened to discover a process by which the separation was very easily effected, and this process had been recently patented. It consists in taking impure tin, containing from 5 to 10 per cent. of tungsten (worth £25 per ton less than tin of ordinary purity), granulating it by melting it in a reverberatory furnace, and allowing it to flow into a vessel containing water. This granulated tin is then placed in a pan with common hydrochloric acid, which may be obtained from the soda manufacturers at almost a nominal price. This being heated, hydrogen gas is evolved, and a solution of chloride of tin is obtained. In this operation it is necessary that the tin should be present in excess: unless it be so, a certain portion of tungsten is dissolved. Should, however, the operation be carried on too far, and a portion of tungsten will be dissolved, the addition of a small quantity of impure tin precipitates the tungsten, and chloride of tin, free from tungsten, is obtained. This is turned off into a vat, in which more granulated impure tin is placed, and any arsenic or antimony remaining is there deposited, and a pure solution of chloride of tin obtained. From this we have to get the chemically pure tin we require, and which is quite as good as the stream tin of Cornwall. Into this bath we put bars of metallic zinc, which precipitates the tin in a spongy mass, when instead of chloride of tin we get chloride of zinc. The tin thus produced may be fused into bars, or sold as the best tin. The chloride of zinc must be so used as to lower the expense of the whole process. To do this, it is precipitated by milk of lime, or common chalk; we then get oxide of zinc, which is largely used as a pigment; and to give it sufficient opaqueness for that purpose, the washed oxide of zinc is heated to redness, when it is found to be equal to the ordinary oxide of zinc obtained by sublimation.