THE BRITISH WINE-MAKER

AND

DOMESTIC BREWER,

A COMPLETE PRACTICAL AND EASY TREATISE ON THE ART OF MAKING AND MANAGING EVERY DESCRIPTION OF BRITISH WINES, LIQUEURS, ALES, BEER, AND PORTER, WITH THE AID OF THE SACCHAROMETER.

CONTAINING ALSO

A SUPPLEMENT ON THE RHUBARB PLANT,

SHOWING IT TO BE A BASIS NEARLY AS VALUABLE AS THAT OF THE GRAPE, FOR PRODUCING CHAMPAGNE, HOCK, MADEIRA, AND CONSTANTIA.

BY W. H. ROBERTS,

AUTHOR OF THE SCOTTISH ALE-BREWER, &c.

FIFTH EDITION.

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ENTERED IN STATIONERS' HALL.

ADVERTISEMENT TO THE FIFTH EDITION.

The Author, in putting forth the Fifth Edition of the British Wine–Maker and Domestic Brewer, would beg leave to direct attention to the Supplement added to the present Edition, on the merits of the Juice of the Rhubarb Plant, as a basis nearly as valuable as that of the Grape, for the production of Champagne, Hock, Madeira, Constantia, and other favourite Wines.

This Supplement, the Author trusts, will prove interesting and acceptable, as well as useful, to the amateur Wine-Maker.

British Wine-Works, Laverock Bank,
Edinburgh, *April* 20, 1849.

PREFACE TO THE FOURTH EDITION.

The Author begs respectfully to introduce to the public a Fourth Edition of THE BRITISH WINE MAKER and DOMESTIC BREWER.

In order to render the Treatise complete in all its details, the present edition has been throughout revised, improved, and greatly extended; indeed the Introduction, the Wine-Making, and the Brewing having each been remodelled, it may be considered almost a new work.

The instructions given for making the various wines are based on the experience which the Author has gained, since the publication of former editions by his unremitting labours and untiring perseverance during the last ten years.

A new ingredient for wine-making has been lately introduced into this country, namely Green Ginger; and the Author having succeeded in producing from this root a most delicious beverage, which is also highly beneficial as a stomachic, has given full directions for making Green Ginger Wine,—a wine now deservedly appreciated.

The Author having derived much information from a scientific letter of Dr. Macculloch's, on the substances of our Native fruits, together with his experience in conducting the various processes indispensable for the production of good wine, has made copious extracts from this letter.

The Third Part, namely that on Domestic Brewing, is almost completely new, and in it the Author has clearly pointed out, and proved where sugar may be profitably used as an auxiliary in the making of ale and beer; both to the improvement of their flavour and their preservation.

Having pointed out the advantages to be derived from sparging instead of a second mashing, he has given two diagrams of a self-acting sparging machine.

In fact, the Author feels warranted in confidently announcing this work as the best, and only treatise on the subject to be relied on which can be obtained.

BRITISH-WINE WORKS,
Laverock Bank, Edinburgh,
June 1st 1847.

PREFACE TO THE SECOND EDITION.

In introducing to the Public a second edition of the British Wine-Maker and Domestic Brewer, the Author begs to tender his best acknowledgments for the gratifying manner in which the work has been received. The first edition was published early in February of the present year, and so great has been the demand for it, that it has been found necessary to issue a new impression, though only a few months have elapsed since its first appearance. For this proof of the utility of his labours, the Author is sincerely grateful; and he trusts that those who have followed the instructions laid down in this work will have found the result in entire accordance with the expectations which he had held out to them.

It has been the earnest endeavour of the Author to render the present edition as perfect as possible. He has renewed many of his former experiments, for the express purpose of testing the theories and principles which the work details; and he has spared no pains in labouring to place these suggestions which it conveys beyond the possibility of failure. He has also endeavoured to simplify and arrange his materials in such a manner as to make the various processes and chemical information clear to the most superficial capacity. To effect these objects, he has added considerably to the bulk of the volume, as will be observed by a comparison of the present with the former edition ; and on the whole, he hopes that he has been enabled to produce altogether the most complete work on British Wine-Making and Domestic Brewing that has yet been given to the public.

In conclusion, the Author cannot be too sensible of the flattering notices which he has received from the periodical press : and he entertains a strong hope, that, with their able and zealous assistance, the subject to which he has directed attention will shortly become as popular, as in his humble estimation it deserves to be. The Author may also take this opportunity of informing the public, that he intends in a few months to publish a short practical treatise on Brewing, as it was formerly conducted in Scotland. It is almost unnecessary to observe, the old method differs considerably from that now practised, particularly with respect to fermentation ; and to the superiority of the former over the latter, is Scotch ale indebted for the great fame which it so long enjoyed, but which is now unfortunately on the decline. This work will be solely addressed to the common brewers, and more particularly to those of England.

Edinburgh, June 1835.

ADVERTISMENT TO THE THIRD EDITION.

The announcement of a *Third Edition* of the British Wine-Maker affords the Author another opportunity of returning his thanks to the Public for the kindness and indulgence with which the work has been received; and also to those gentlemen connected with the Newspaper Press, who, being aware of its useful objects, have lent their aid in making them known.

As the only sure test of all theory is actual experiment, Mr. Roberts has been induced to prepare quantities of the most approved Wines mentioned in the British Wine-Maker in the manner directed in the receipts, or on the same plan that he has followed for a series of years in making Wines for domestic use. These Wines have been made by accurately weighing or measuring the ingredients employed, and with the aid of the Saccharometer, which instrument has been more particularly described at page 80 than in the former editions of this work. The different stages of the process were carefully noted, and Mr. Roberts is led to hope that the result will be found to maintain the character which he claims for such Wines as are made exactly by his receipts. In the Wines he has recently made, the principal basis is *raisins*—that is, dried grapes—which is the closest approach that the present financial system permits the Wine-brewers of this country to make to Wines from the fresh grape. Notwithstanding the restriction, Mr. Roberts believes that he has been successful in giving his Wines, in no mean degree, the *flavour* as well as the *body* of Foreign Wines. Those families who wish to make trial of the Wines before attempting the manufacture for themselves, may now obtain specimens from him of Champagne, Frontignac, Malmsey, Madeira, Dry Raisin, Sweet Raisin, Orange Wine, Ginger Wine, &c. &c., in quantities of not less than one dozen, sorted to order,—at the prices at which British Wines are generally sold, varying from 14s. to 25s. per dozen.

Laverock Bank, Edinburgh,
May 1836.

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PART I.

CONTAINING

INSTRUCTIONS FOR MAKING BRITISH WINES, WITH THE AID OF THE SACCHAROMETER.

INTRODUCTION.

Although the works before the Public on this useful manufacture are numerous, there appears scarcely one of them capable of directing the Amateur Wine-Maker to procure uniformly a cheap, wholesome, and well-fermented wine from the fruits of this country. On the contrary, the receipts in these works are, in general, nothing more than theoretical fancies; and by following any of them, should the maker meet with success, he will be indebted for it to chance alone.

Having been for many years endeavouring, by experiments, to make good British wines, and having derived much valuable information from the works of Dr. Macculloch and a few others who have written upon the subject, together with the new methods of conducting the processes which were the result of my own experience, I have been enabled to produce wines of such a quality as fully to compensate me for the trouble which I have taken.

The Caledonian Horticultural Society having considered the manufacture of home-made wines, a subject worthy of their attention, had for some years been in the habit of awarding annual premiums to those who produced the best wines made from the fruits of this country. The importance which they attached to the improvement of this manufacture, was a powerful inducement for me to persevere in the cultivation of this art. Some years ago, I was encouraged, by several of my friends, to become a candidate for the medal. I did so, and was successful. This gave me a greater desire than ever to persevere. The following year I again sent five different wines for competition, when I was again successful.

I was requested by the Secretary to give the Society a detailed account of the process I adopted in the manufacture of my wines, particularly if I could give any information on fermentation, a part of the process which seemed little if at all understood or practised by the manufacturers of home-made wine. The paper which I drew up met with their entire approbation; so much so, that, in the following words, they recommended to future competitors to follow my method. "And the Committee cannot conclude, without strongly recommending to future competitors to follow, as nearly as they can, the mode adopted by ——— ———, who seems, from the specimens of five sorts of wine produced for competition, to have established a method of preparing, upon scientific principles, a perfect wine of most excellent quality."

The reader may well believe, that this encomium from so highly respectable, and scientific a committee, increased my zeal to make farther experiments in this interesting manufacture, in order to endeavour to elucidate what might yet remain concealed in "this hitherto conjectural art." Steadily pursuing this object, I have made many valuable discoveries; and for the reasons before stated, have been induced to lay before the public the result of my experience. I am aware, however, of the difficulty which meets me at the very commencement, namely, the prejudice so commonly entertained against home-made wine in Scotland: and in England, although it is occasionally present at the tables of the rich as well as of the middling classes, this prejudice still exists with the former; but here it is so strong, that this wine is scarcely tolerated, and where it is, it is only presented to children. In palliation of this, it may however be said, that in this country (Scotland) there is another cause for the bad reputation home-made wine has obtained. In nearly nine cases out of ten, the wines are either a perfect syrup, punch, or vinegar, and even at the very best, are only ill-fermented compounds of spirit, juice, and sugar, which, when used even in moderate quantities, instead of invigorating the system as they ought to do, prove detrimental to the operation of the digestive organs. But this arises solely from the quality of the wine being bad, in consequence of the manner in which it is made, and not from the impossibility of manufacturing a wine, which would act as a generous stimulant and promoter of health. It may be asked, why are home-made wines more used in the South than in the North? The answer is, that in England they are better made, and consequently of a very superior quality. Fermentation there, is a subject to which a certain degree of attention is paid; a much greater quantity of wine is made at once, and it is kept for a longer period before it is used, than in Scotland. But even in England, fermentation is not sufficiently regarded, or, in more correct language, is too little understood; and from this it may easily be seen, that an evil of the first importance necessarily results, an inability to obtain a true and perfect wine; and it is this evil which, I trust, I shall be enabled to remedy, by a full though simple explanation of the facts of which I have been a witness through all its various stages. Should any of my readers, by following my example, succeed as I have done, I doubt not but that, in a very few years, instead of finding at the tables of our friends the adulterated and deleterious mixtures called Port, Sherry, and Cape Madeira, we shall be enabled to enjoy a good and wholesome glass of one of our true British wines, and at the same time be enabled to boast, that we have at length raised them to that place which we have now discovered they are fully entitled to occupy. Before I enter more into detail upon the subject, perhaps it may be advisable to say a few words relative to those wines styled Foreign, and drunk as such, although they are in reality made in this country.

It has been asserted upon good authority, that more than one-half of the wine called foreign, is either made up in this country, or adulterated to a very great extent. In a recent work by Cyrus Redding, he states as follows, in page 216:— "Five-eighths of the wine brought to England is so coarse, and is such a medley of ill-flavoured heterogeneous vine produce, bad Portuguese brandy, and other matters, that any ingenious person may increase one pipe to three, by the addition of unexciseable articles, without any fresh injury to the stomach of the consumer, or to the appearance of the wine happening." This is not an unfaithful picture of facts which are dwelt upon in another chapter.

Now, what does he say of Port wine (page 334)? "Into Oporto, no less than 4000 pipes of Figueras wine are said to have been introduced, in one year to mingle with the wines destined for England. It is impossible to calculate what the loss to the public in revenue must be by the adulterations of wine in this country. The basis of most of these is Cape wine, which pays a low duty, and is consequently most conveniently useful in this transmutation of wines for purposes of lucre. The truth is, that a vast quantity of fictitious Port is passed of in this country for that which is real ; and the idea deserves credit, from the very considerable importations of wine, which can only be used for such purposes ; to which two or three and twenty hundred tuns of Cape, a quantity of Beni Carlos and of Figueras wines undoubtedly contribute, to say nothing of what is made without having in its constituent parts a single drop of grape juice at all. In a most useful work, professing to treat of the art of adulteration, the following mode of managing this branch of trade is well exposed.* It relates to the first class of manufactured wine, in contradistinction to the second, which has none of the component parts of wine at all in its composition. It is premised that all wine manufacturers keep largs vats for the purpose of similar fabrications. Beni Carlos

* Wine and Spirit Adulterers unmasked. Robins and Co. One Vol. 12mo, 1829.

wine can be purchased, including duty, for £.38 per pipe, Figueras for £.45, Red Cape, £.32; of Mountain wine, to follow the author, "a small quantity may be added, if required, to soften and give an appearance of richness; Sal tartar, a portion to occasion the compound, when bottled, crust firm and soon, dissolved with a proportionate quantity of gum dragon, to impart a fulness of flavour and consistency of body, and to give the whole a face. In addition to these may be introduced brandy-cowe (the washings of brandy casks), which costs nothing, in the proportion of about three gallons to every hundred gallons of made-up wine, in making the second quantity of fictitious wine. Into this may be racked as follows:—

	Imp gal.			*Imp gal.*				
2 Pipes of Beni Carlos,	230	at L.38	*per*	115	cost L.76	0	0
2 Pipes of Figueras,	230 —	45 —		115 —	90	0	0
$1\frac{1}{2}$ Pipes of Red Cape,	137 —	32 —		91 —	48	3	6
$1\frac{1}{2}$ Pipes of stout good Port,	165 —	76 —		115 —	109	0	10
1 Pipe of common Port,	115 —	63 —		115 —	63	0	0
Mountain,	20 —	60 —		105 —	11	8	7
Brandy-cowe,	20 —	0 —		0 —	0	0	0
Colouring,	3 —	0 —		0 —	0	3	1
Et ceteras; $2\frac{1}{2}$ lbs of salt of tartar, and 3 lbs. gum dragon,	0 —	0 —		0 —	0	4	0
Extra allowance for loss by bottoms,	0 —	0 —		0 —	3	0	0
8 Pipes Port, 115 gal. per pipe,	920				L.400	0	0

The value of the empty pipes and hogsheads is L.5, 5s., and not being deducted from the amount in this example, is supposed to pay all expenses of cartage, that part of the *et ceteras* which may not be sufficiently charged or paid for by the water used to dissolve them, and which is sold as wine, and for any additional loss which may be sustained by the bottoms. Thus, then, we have eight pipes of superior Port wine, made up according to the best and most approved plan, and which stands advertising dealers at L.50 per pipe of 115 imperial gallons, every expense included and reckoned at the very outside. The wine thus made up, if drawn off in bottles of the size of six bottles to the gallon, old measure, and adding a charge of sixpence a dozen extra for corks, would cost, only 16s. 9d. per dozen." But this is not all. He goes on to state: "So impudently and notoriously are these frauds practised, and so boldly are they avowed, that there are books published, called, Publicans' Guides, and Licensed Victuallers' Directors, in which the most infamous receipts imaginable are laid down to swindle their customers. One of these recommends Port wine to be made after the following manner: The cask sulphured, after which may be added, twelve gallons strong Port, six gallons rectified spirits, three gallons cogniac brandy, forty-two gallons of fine rough cyder, making sixty-three gallons, which cost about 18s. per dozen. In another receipt, forty-five gallons of cyder, six gallons of brandy, eight gallons of Port wine, two gallons of sloes, stewed in two gallons of water, and the liquor pressed off. If the colour is not good, the tincture of red sanders or cudbear is directed to be added. This may be bottled in a few days, and a tea-spoonful of the powder of catechu being added to each bottle, a fine crusted appearance on the bottles will quickly follow. The ends of the corks being soaked in a strong decoction of Brazil wood and a little alum, will complete this interesting process, and give them the appearance of age."

To prove how well an imitation of Port wine can be effected by those who professionally follow this mysterious art, Mr. Cyrus Redding gives the following anecdote :—" The adulteration of wine, among that of other articles, has of late become almost a scientific pursuit, and the clumsy attempts at wine brewing made a century ago, would be scorned by a modern adept. It is said that when George the Fourth was in the 'high and palmy' days of early dissipation, he possessed a very small quantity of remarkably choice and scarce wine. The gentleman of his suite, whose taste in wine was hardly second to their master's, finding it was not demanded, thought it forgotten, and relishing its virtues, had exhausted it almost to the last bottle, when they were surprised by the unexpected command that the wine should be forthcoming at an entertainment on the following day. Consternation was visible on their faces; a hope of escaping discovery hardly existed, when one of them as a last resource went off in haste to a noted wine brewer in the city, numbered among his acquaintance, and related the dilemma. 'Have you any of the wine left as a specimen?' said the adept, 'O yes, there are a couple of bottles.' 'Well then, send me one, and I will forward the necessary quantity in time, only tell me the latest moment it can be received, for it must be drank immediately.' The wine was sent, the deception answered; the princely hilarity was disturbed by no discovery of the fictitious potation, and the manufacturer was thought a very clever fellow by his friends. What would Sir Richard Steel have said to so neat an imitation, when in his day he complains that similar fabrications were coarsely managed with sloe juice: the science of adulteration must then have been in its infancy.

"It is to be lamented that adulterations of such wines as Port may be so easily practised, as to deceive very experienced tastes, owing to their spirituous strength and coarseness."

After what has been related, the reader might suppose that the disgusting catalogue of the many fabrications of Port wine could scarcely be extended. We find it otherwise, however. About two years ago, a Pamphlet was published, titled, "A WORD OR TWO ON PORT WINE," by a wine-merchant, who had resided in Portugal for eleven years. In this pamphlet, he assures us, that the whole of the wines which are exported from Portugal to this country are more or less adulterated. If what he asserts is really true, it is quite out of the question to suppose that, notwithstanding we purchase our Port wine in bond, there is any security of its being unadulterated. None whatever, although we may allow ourselves to be deceived in this respect, we have only this advantage in purchasing in bond, that the wine is *Foreign*,—an advantage certainly of the greatest importance, in one sense, because such are our inveterate but causeless prejudices, that whatever wine we may present —however unpalatable or insipid—it is still a *sine qua non* that it should be paid for as foreign wine. What does it signify though it is such as this writer represents it to be, a heterogeneous mass of the juice of the grape, the juice of the elderberry, loaded with treacle or sugar, and compounded with nearly one-fourth of its bulk with the worst of Brandy? But we will now allow the Oporto wine-merchant to speak for himself:—"Of the Port wine sent to England, a very large portion hardly deserves to be called wine at all, and still less Port wine." After enumerating the different kinds of grapes in general use for the production of this kind of Port wine, he proceeds:—"To produce black, strong, and sweet wine, the following are the expedients generally resorted to:—

"The grapes being flung into the open store-vat indiscriminately, on the stalks, sound and unsound, are trodden by men till they are completely mashed, and there left to ferment. When the wine is about half fermented, it is transferred from the vat to *tonels*, and brandy (several degrees above proof) is thrown in, in the proportion of twelve to twenty-four gallons to the pipe of *must*, by which the fermentation is greatly checked.

"About two months afterwards, this mixture is coloured thus:—A quantity of dried elderberries is put into coarse bags; these are placed in vats, and a part of the wine to be coloured being thrown over them, they are trodden by men till the whole of the colouring matter is expressed, when the husks are thrown away. The dye thus formed is applied according to the fancy of the owner; from twenty-eight to fifty-six pounds of the dried elderberry being used to the pipe of wine! Another addition of brandy, of from four to six gallons per pipe, is now made to the mixture, which is then allowed to rest about two months.

"At the end of this time, it is, if sold, (which it is tolerably sure to be, after such *judicious* treatment) transferred to Oporto, when it is racked two or three times, and receives, probably two gallons more of Brandy per pipe; and it is then considered fit to be shipped to England, it being about nine months old; and at the time of shipment, one gallon more of Brandy is usually added to each pipe. The wine thus having received at least twenty-six gallons of Brandy per pipe, is considered by the merchant *sufficiently* strong—an opinion which the writer at least is not prepared to dispute.

"This is one way. Another way is this:—the finer sort of grapes are selected of several kinds; those which are decayed, or unripe being removed. They are then trodden as in the preceding case, but the fermentation is allowed to proceed three-fourths of the full time proper for it. The wine is then transferred to the tonels, where it receives from six to ten gallons of Brandy, of the same strength as that before mentioned, per pipe.

"About two months afterwards it is drawn off into other tonels, and each pipe receives about six additional gallons of Brandy, and from six to eighteen gallons of Jerupiga.

"The most approved receipt for making Jerupiga is this:—to fifty-six pounds of dried elder-berries, and sixty pounds of coarse brown sugar or treacle, add seventy-eight gallons of unfermented grape juice, and thirty-nine gallons of the strongest Brandy. Mix all thoroughly together.

"After the wine has received the additional Brandy and the Jerupiga, it is then sent to Oporto, when the future treatment proceeds as in the first case, except that it receives there, on the whole, five, instead of two gallons more of Brandy.

"Of the Port shipped for the English market as vintage wine, that is, from nine months, to two years old, at least two-thirds is made in one or other of the ways just mentioned."

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"Of the remaining third of the wine which goes to England, only a very small portion is without a considerable admixture of Jerupiga! This is the best kind of the adulterated wines; but still it has not received less than twenty-five gallons of strong Brandy."

The author of this pamphlet proceeds to give an extract "from the Remonstrance of the English factory at Oporto in 1754," alleging that the farmers of the Alto Douro adulterated their Port wines. The farmers retorted and threw all the blame upon the English factory—"the English merchants knew that the wine of the factory, from being of good quality had become better, and they wished that it should advance even further than its natural capabilities would admit, and, on being drunk, that it should be *a potable fire in* spirit, *an inflammable powder in fieriness*, an *ink in colour*, a *Brazil in sweetness*, and an *India in aroma!*

"The wines of Madeira are in like manner adulterated there, or wholly manufactured in England, which, from these devices, may justly claim the title of a universal wine country, where every species is made, if it be not grown. The wines thus manufactured are not served up at the tables of the rich, but are principally consumed by those who only drink wine occasionally, on the presence of friends. Not that the better classes of purchasers escape being imposed upon, but they are cozened in a different manner, by giving West India Madeira an artificial flavour, and passing it off for that which is East India, and in consequence much dearer. The basis of the adulteration of Madeira is Vidonia, mingled with a little Port, Mountain, and Cape, sugar-candy, bitter almonds, and the colour made lighter, or deepened to the proper shade, as the occasion may require. Even Vidonia itself is adulterated with cyder, rum, and carbonate of soda, to correct the acidity, and sometimes a little Port or Mountain is added. Bucellas, with every other species of wine that it is worth while to imitate, is adulterated and manufactured in this country with cheaper substances. Even Cape wine itself has been imitated by liquids if possible inferior to the genuine article."

Regarding Sherry, he observes (page 322), "In England, Sherry of the brown kind, and of low price, when imported, is mingled with Cape wine, cheap brandy, the washings of brandy casks, sugar-candy, bitter almonds, and similar preparations, while the colour, if too high for pale Sherry, is taken out by the addition of lamb's blood, and then passed off for the best Sherry by one class of wine-sellers and advertisers. The softness of good Sherry is closely imitated. Gum benzoin is used to produce the counterfeit brown Sherry, which in the real wine is given by boiled *must*. The whole is tempered in a large vat, and sold out in bottles, fifteen to the dozen, on which a profit of 12s. per dozen is made."

Having now passed over the common wines, let us see what he has to say regarding Claret, Champagne, &c. Of the former, he adds (page 329), "Bourdeaux wine in England and in Bourdeaux, scarcely resemble each other. The merchants are obliged to *work* the wines before they are shipped, or, in other words, to mingle them with stronger wines, such as Hermitage or Cahors, which is destructive almost wholly of the bouquet, colour, and aroma of the original wine. So much are the merchants sensible of this, that they are obliged to give perfume to the wine thus mixed, by artificial means, such as orris-root and similar things. Raspberry brandy is sometimes used in minute quantities for the same purpose." This might pass almost unnoticed, if all clarets were so mercifully dealt with. Again (page 330), "But there are large quantities of what is mis-called claret manufactured in this country, for the making of which, as well as *improved* claret of prime character, many receipts are extant. A very inferior French wine, sold to the adulterators at a few sous a bottle, is frequently mingled with rough cyder, and coloured to resemble claret, with cochineal, turnsole, and similar matters. This is pronounced of fine quality, and sold as such in this country. Certain drugs are added as they appear to be wanted, and the medley, to which a large profit is attached from the imposition, is frequently drank without hesitation, and without any discovery of the cheat."

Champagne is the last wine about which I shall quote the observations of this author, but before doing so, I would diverge a little, and insert a paragraph which appeared in the "Medical Times" of 1846, regarding the extraordinary adulteration of Champagne, and which was discovered by Professor Liebig.

"*Singular Adulteration of Champagne.*—A singular mode of increasing the intoxicating power of Champagne has recently been discovered in Germany. It appears that a wine-merchant of Rheims has for some years past enjoyed the almost exclusive privilege of supplying the kingdom of Wurtemberg with that wine, and that an extraordinary effect has been noticed to attend the drinking of a single glass thereof. After several analyses of the wine had been made, the contents of some of the bottles were examined by Liebig, who ascertained by analysing its gases, that it contained one volume of carbonic acid gas, and two of the laughing gas, or protoxide of nitrogen. The last-named gas, the peculiar effects produced by which on the animal economy, when it has been respired, are well known, is prepared by the decomposition of the nitrate of ammonia. If this salt be at all impure, and not unfrequently when it is used absolutely pure, nitrous acid is evolved in the first instance during its decomposition. Chemists, therefore, when preparing the laughing-gas, are in the habit of throwing away the first proportions of gas that come over, and farther test the character of the gas before they allow it to be inspired, as the nitrous acid gas would act on the economy as a dangerous poison. Furthermore, if the lungs contain air when this gas is inhaled, nitrous acid gas will be formed, and danger result. There is another danger occasionally encountered, when this gas is used for purposes of exhilaration by respiration. In persons of consumptive habit, it may cause severe pain at the chest, difficulty of breathing, and even spitting of blood. In those who have a tendency to apoplexy or palsy, mischief in the head may be caused by its incautious use. How far these results may be modified by the gas being taken into the stomach, it is at present impossible to say, but the subject admits of, and deserves, farther inquiry. At all events, there is the danger of a portion of the nitrous acid gas being used in the wine, together with the laughing gas, and the adulteration is one of a most improper as well as singular character. It can hardly be regarded as altogether innocuous."

Regarding this wine, Cyrus Redding says

(page 331), "The adulterating of it is most obvious to such only as are well acquainted with it in the genuine state, and this wine is adulterated in England with more boldness than any other country. The most wretched wine that can be bought in the country, at a franc a bottle, is known to have been imported, to throw out the wine, and fill the bottles with Champagne from the gooseberry, on which a profit of 40s. or 50s. a dozen may be made. There is a very weak Champagne made in the country, which was, until very lately, consumed wholly on the spot, incapable of resisting decomposition for more than one year. This, certain shrewd winemakers from England have discovered, and imported as the best Champagne. It is without the flavour or bouquet of the genuine wine, it froths or effervesces freely, but the colour is paler than that of better quality. This wine is not worth more than a few sous a bottle in the country. In England, it is purchased and drank for the genuine article by those who are only now and then introduced to wine of that name. Gooseberry wine itself is often passed off for Champagne upon the inexperienced, and the full price of the genuine article is exacted. The very bottles are bought up for the purpose of filling with gooseberry wine, and then corked to resemble Champagne." In summation of the whole, he concludes, (page 327,), "Indeed, so coarse are three-fourths of the wine commonly drank in England, from the foregoing cause principally, operating as a disguise for the vilest imitations, that they might easily be made without the juice of the grape forming any part of this composition."

I could adduce proof from many other authors that Mr. Cyrus Redding stands not alone in his statements, nor that he has in the least degree exaggerated his description of the shameful impositions by which the respectable part of the community is daily and hourly deceived by purchasing and drinking as genuine wine such adulterated and unwholesome mixtures, and which, in fact, are in many cases impregnated with *poisonous ingredients*. To establish the accuracy of the foregoing statement regarding these vile, dishonest, and illegal practices, I shall give a short extract from Accum's work on the adulteration of food. "All persons moderately conversant with the subject, are aware that a portion of alum is added to young and meagre red wines, for the purpose of brightening the colour; that the Brazil wood, or the husks of elderberries and bilberries, are employed to impart a deep, rich, purple tint to red Port of a pale, faint colour, and gypsum is used to render cloudy white wines transparent; that an additional astringency is imparted to immature red wines by means of oak-wood, saw-dust, and the husks of filberts; and that a mixture of spoiled foreign and home-made wines is converted into the wretched compound frequently sold in this town by the name of '*Genuine Old Port;*' a nutty flavour is produced by bitter almonds; fictitious Port wine is flavoured with a tincture drawn from the seed of raisins; and the ingredients employed to form the bouquet of high-flavoured wines are sweet brier, orris-root, clary, cherry-laurel water, and elder flowers. The flavouring ingredients used by manufacturers, may all be purchased by those dealers in wine who are initiated in the mysteries of the trade. And even a manuscript receipt book for preparing them, and the whole mystery of managing all sorts of wines, may be obtained on payment of a considerable fee." And then again: "The particular and separate department in this fictitious wine trade, called crusting, consists in lining the interior surface of empty wine bottles, in part, with a red crust of super-tartrate of potash, by suffering a saturated hot solution of this salt, coloured with a decoction of Brazil wood, to crystallize within them." This artificial crustation is not confined to the bottle; for, he says (pages 103 and 104), "A correspondent operation is performed on the wooden cask, the whole interior of which is stained artificially with a crystalline crust of super-tartrate of potash, artfully mixed in a manner precisely similar to that before stated. Thus the wine-merchant, after bottling off a pipe of wine, is enabled to impose on the understanding of his customers by taking to pieces the cask, and exhibiting the beautiful dark-coloured and fine crystalline crust as an indubitable proof of the age of the wine; a practice by no means uncommon, to flatter the vanity of those who pride themselves in their acute discrimination of wines."

Various other deceptions of a more culpable nature are practised by fraudulent dealers, the most dangerous of which is the admixture of lead, nay even arsenic, in the adulteration. Every intelligent and disinterested reader must concur with Mr. Accum in his just observation, "The merchant or dealer who practises this dangerous sophistication adds the crime of murder to that of fraud, and deliberately scatters the seeds of disease and death among those customers who contribute to his emolument." Few persons could imagine that there are such characters in the world as would, for the sake of gain, diabolically use ingredients in their wine which would "scatter the seeds of disease and death," but the following extract from a paper by Professor Christison, in No. 102 of the Edinburgh Medical and Surgical Journal, will too surely convince them that there are not only such characters as would use poisonous ingredients for the sake of gain, but that poisonous ingredients are really employed occasionally, to disguise the acid taste of which the French and German wines are so very susceptible. The following is the account of this remarkable case :—

In the Edinburgh Medical and Surgical Journal, there is a case related of a family in Roxburghshire having been nearly poisoned by drinking wine in which, by after examination, arsenic was detected. The paper was by Professor Christison, and the following is an abridged abstract.

"On the 1st November, 1829, the family of a baronet in Roxburghshire, together with several visitors, amounting altogether to six persons, all adults, were taken seriously ill during dinner, or soon after it. Most of them rose from the table before the cloth was removed, but two of them were not seized till about an hour after the rest; the symptoms were, in all, sickness, vomiting, and severe pain in the bowels, and, in no long time, one of them had also diarrhæa. The vomiting continued violent till early next morning; and warm water was taken freely to encourage it. In the course of the night, all were affected with a sense of heat in the stomach, throat, and mouth; and in the morning the lips became encrusted, and the skin cracked and peeled off. For three or four days the whole party had a disinclination to eat.

"The simultaneous occurrence of such symptoms, during a meal, in so many persons, left hardly a doubt that some poisonous substance had been mixed with one or other of the articles used at dinner. In order to discover what the poison was, and in what vehicle it had been taken, various articles were sent to me for analysis, through Mr. Stuart of Kelso, one of the surgeons who attended the family."

The Professor goes on to show how he discovered the 250th part of a grain of arsenic in some of the matter which had been vomited, and then proceeds.

"Fortunately, all reason for hesitation was removed by the subsequent proceedings. It was afterwards remembered by the party, that they had all partaken of certain bottles of wine, the remains of three of which were therefore sent to me. In a bottle of Teneriffe, and in another of a light French white wine, sulphuretted hydrogen gas caused no change whatever, and both of them were free of foreign taste. But in the remains of a bottle of Champagne, which also was free of any taste except that of vinous sweetness, the same test caused a copious sulphur yellow precipitate. The arsenical nature of this precipitate was proved by the process of reduction. Two ounces of wine gave one grain and a quarter of sulphuret of arsenic, corresponding to one grain of oxide of arsenic."

Upon inquiry afterwards, it was proved, that the bottle of Champagne was brought from the cellar, before dinner, by Sir John Douglas himself, who undid the wire during dinner, immediately before the wine was used. This circumstance clearly showed that the wine had been poisoned before the bottle was corked by the wine-merchant.

These sad details must certainly convince a disinterested reader that there is at any rate a very great risk of procuring a genuine article in foreign wine; for if it is correct, that five-eighths of the wine brought into this country are spurious, and that every one of the pipes imported may be converted into three, it is next to impossible to obtain it. Notwithstanding all that has been written on the subject of adulteration of wine, I believe that good wine may still be got by going to a respectable wine merchant, and giving him his price, instead of purchasing from such as advertise Good Old Port at 20s. to 24s. per doz., and that there are those who would not upon any consideration whatever, allow adulterated wine to enter their premises were they aware it was so; but the misfortune is that they have no way of detecting a genuine article from an adulterated one, and, honourable themselves, they rely implicitly upon the respectability of their correspondents abroad. It is true that they can ascertain to a certain degree of correctness the *quantity* of spirit the wines have been dosed with abroad, but of the *quality* of that spirit, as well as of the means which have been resorted to for the fabrication of those wines, they must be content to remain in the dark.

Now, no one will venture to assert, that liquors so compounded as those generally sold are, can be so palatable, wholesome, or economical as a well-made, well-fermented British wine, all the processes of which we have had under our own controul. As this is truly the case, we certainly ought not to run the risk of being poisoned by the one, because it is Foreign, when we have it in our power to obtain the other genuine and generous, although British, and consequently *vulgar*, upon such easy terms and at so trifling an expense.

But it has been stated by some, that it is impossible to make a drinkable wine from any fruits grown in this country, in consequence of the great proportion of malic acid, and the deficiency of saccharine matter. This is an assertion almost too absurd to require contradiction; but in order to show how little truth there is in it, or rather how utterly devoid of truth it is altogether, and how ignorant of the subject those are who make it, allow me to relate the following anecdote, for the authenticity of which I vouch:—Eight or nine years ago, a very respectable friend of mine, who lived much in the world, and who was in the habit of entertaining his friends with a variety of continental wines, sent me two pint bottles, which he begged I would fill with some very old black currant wine, made in a particular way; a wine of which he was very fond, and always enjoyed much while visiting me. Gratified with this opportunity of pleasing my friend, I complied with his request, bottled the wine, sealed it, and sent it to him. Some weeks after, a very large party dined with him. It is not my intention here to name the individuals of that party; suffice it to say, that, amongst others, there were two present whose judgment in wines was reckoned unexceptionable. After having enjoyed Hock and Champagne, and when the parmesan cheese was brought, my friend requested his servant to bring a small bottle which was on the sideboard. The servant brought it, with a napkin rolled round it. The liqueur glasses were all ready on the salver to receive the contents. The mouths of the guests being in proper trim to enjoy it after the cheese, it was drawn. The glasses were filled and handed round; one smacked his lips, another pronounced it delicious, a third most delicious, and so on. No one, however dared to give it a name. All eyes were now fixed upon the judges, first on one, then on the other. One of them confidently asserted that it was the very best Constantia he had ever tasted. The second pint was uncorked, and enjoyed to the same extent as the first. The story I had from the gentleman himself, as well as from one of the party, who mentioned it merely to me as a story, characteristic of my friend's style in doing any thing, and who was not aware of its being home-made wine until I informed him of the fact. Surely after this, no one will now be found to bring forward the question, Is it possible, or is it not possible, to make a good wine in this conntry? Such men as those who dined with my friend might be deceived as to whether the wine was foreign or home-made, but we can scarcely imagine they would be mistaken as to whether it was good or bad.

After the publication of the second edition of this work, in consequence of the repeated solicitations of my friends, I commenced making British wines, and succeeded far beyond my expectations; so much so as to induce me since the publication of the third edition to proceed on a much larger scale. My imitation of Foreign wines, particularly that of Champagne and Hock, has been so close as to deceive the very best judges; indeed I have been favoured with the relation of very many amusing anecdotes, one or two of which, I may here introduce.

In one of the principal manufacturing towns of Scotland, I had several customers, consisting of bankers, merchants, &c., one of them was particularly fond of my wines, especially as his precarious health required a stimulant, and he found in them that advantage, without the bad effects which in his case invariably followed the use of Foreign wines. Although a perfect stranger to me, yet appreciating the value of my wines, he recommended them to his friends, including his next door neighbour, a highly respectable elderly gentleman. On one occasion when I happened to be in that town, I called on Mr. ——— for payment of a small account, when he was kind enough to send for his friend and introduce me to him. After extolling the wines, particularly the Champagne, he was very importunate that his friend should order some. In answer to those solicitations the old gentleman remarked, "I am one of the old school, I am now seventy years of age, and I have never sported Champagne, Claret, or any other expensive wines. Port and Sherry are the only wines I have used except on extraordinary occasions, when I have brought forward a bottle of Madeira; and as this is the case, I certainly do not feel disposed now, at my advanced age, to introduced Champagne at my table. I will however be most happy to give your friend an order for a case of Ginger wine, which I understand is so highly esteemed in this neighbourhood for its beneficial qualities." Some months afterwards on my again visiting this town, I waited on the old gentleman at his counting-house, when he received me most politely saying, he was glad to see me, as he had a very amusing and gratifying story to tell me. He thus proceeded. "Some time after receiving your case of Ginger wine, I called on my neighbour Mr. ———, to thank him for having introduced me to Mr. Roberts, as his Ginger wine had proved very valuable in my house, for we had all been the better of it. I suppose he thought now there might be a chance of my altering my mind, and ordering some Champagne from you; but when he found I would not yield, he said, 'well Provost, I suppose if you will not buy Champagne from Mr. Roberts, you will have no objections to accept a bottle or two of it,' I replied, certainly not, and I will be most happy to see you and a small party of our friends at dinner to drink it. The party assembled, but an hour or two before dinner, I had placed the three bottles Mr. ———

had sent me on the chimney-piece, for the weather was cold, and I was informed that a little heat was necessary. On the gentlemen entering the dining room, I fancied I saw all their eyes fixed on the mantle-piece, and after we had sat down, I said, 'I see gentlemen your eyes are all fixed upon the silver headed bottles on the mantle-piece, you know very well that I never sport Champagne, but a kind friend having received a case, has made me a present of three bottles—there they are, (but remember there are no more,) therefore when you feel inclined, commence and enjoy them. No doubt many of you are quite expert in the uncorking of Champagne. Upon this they immediately selected a young officer; the cork of the first bottle was drawn and the wine highly relished, when the officer remarked, 'this is really delicious wine, something like Champagne—a great deal of gooseberry stuff has been sent to this town of late, made by a man in Edinburgh of the name of Roberts, but wherever it has been presented where I have been, I have always detected it, they cannot easily deceive me.' 'Aye,' said another, 'this is the real stuff'—'yes, yes, said a third, there are no gooseberries here.' The three bottles were soon finished, and they began to be in hopes that there might be some mistake as to the quantity, for one of them said, 'Are you sure, Provost, it was only *three* bottles your friend sent; three is such a curious number to make a present of; perhaps the servant has made some mistake, will you allow me to ring the bell to inquire?' of course I assured them that there was no mistake, and they must just be contented with what they had got.

"When they were about to say, 'good night,' they thanked me for my handsome entertainment, and particularly spoke of the splendid Champagne, saying, it was the best they had drank for a long time, and hoped the next case my friend received, he would be equally liberal to me: to which I replied, that I was most happy they enjoyed themselves so much; for I begged to assure them, that the Champagne was the very best British, and made by a man of the name of Roberts, near Edinburgh. The young officer looked aghast, but upon recovering a little, he thought he must say something, in order that his character, as a judge of Champagne, should not be totally ruined; and mumbled out,—'I thought, after all, there was something peculiar in the taste of this wine, which the French had not.' To which I replied,—'Young man, that won't do now!'

Shortly after, on my way home, I called for one of my customers in another town, a medical man of eminence there, and very fond of my wines; and as a proof of his considering them not only pleasant, but wholesome, he was in the habit of recommending them to his patients, whenever a stimulant was required. He told me he had something to communicate, which would be as gratifying for me to hear, as it would be for him to relate. "Some months ago," he said, "on returning from ——— in a steam-boat to this place, I fell in with two fine young men, Frenchmen. As I perceived they were strangers, I paid them attention. Unfortunately, I could speak very little of their language, and they could speak less of mine: however, we contrived to understand each other, and when we arrived at ———, I took them to their inn, and promised to call next morning, which I did, and showed them all the attention in my power.

"About three months afterwards, I was informed, as I was going over the bridge of ——, that there were lying at the Custom House, two cases, a large one and a small, to my address, and that they were from France. This appeared very strange, and I thought there must be some mistake. Upon making further inquiry, I found that they were really for me, and after paying the charges upon them, I had them sent home. On opening the cases, I found the larger contained wine of different kinds, French and German; and the smaller, medical books; and that they both came from the two young Frenchmen. This present of wine very soon got wind, and I had no rest until I invited a party to dinner, to taste some of them. Not pretending to be a great judge of wine myself, but always fancying your Hock was superior to what I generally got at the tables of the gentlemen with whom I occasionally dined, and having opened a bottle or two from the case I received; I still thought yours superior, and preferred it. As I was rather anxious to discover whether the opinion of my friends coincided with mine, I took two bottles of Hock out of the case, and placed them on the table, along with two of yours. Of course the whole party considered the whole were Foreign, and I was highly delighted to observe that they, as well as myself, preferred yours to the German; for your two bottles were soon emptied, while, from the others, little was taken out."

Another gentleman has addressed to me the following letter on this subject:—

Edinburgh, 21st January 1847.

DEAR SIR,

Some months ago, I had a dinner party at my house, at which there were present, among other gentlemen, a vice-lieutenant of one of our counties, as also a clergyman. Both of these gentlemen have been accustomed to use the best wines. There were on the table a couple of bottles of your Hock, to which both paid particular attention, and praised it much, as well during, as after dinner. When we had retired to the drawing-room, I was called, by way of banter, an extravagant fellow for using such high-priced wine. Next day, I informed the vice-lieutenant that the wine was your production, which he would hardly believe, declaring he had never tasted better.

I think you will be gratified by this anecdote.

I remain,

Dear Sir,

Yours truly,

To W. H. Roberts, Esq.

Nor doI find myself singularly situated. Other judges have been deceived with wines made in this country, when drunk at the tables of their friends, as those were who dined with my friend. In a work published by Sir Edward Barry, 1775, he relates the manner in which the honourable Charles Hamilton rears his grapes and manufactures his wines; after which description he adds : "It would be endless to mention how many good judges of wine were deceived by my wine, and thought it superior to the best Champagne they ever drank! Even the Duke de Mire Poix preferred it to any other wine; but such is the prejudice of most people to any thing of English growth, I generally found it prudent not to declare where it grew, till after they had passed their verdict upon it.

"The surest proof which I can give of its excellence is, that I sold it to wine merchants for fifty guineas a hogshead; and one wine merchant, to whom I sold five hundred pounds' worth at one time, assured me, that he sold some of the best of it at 7s. 6d. to 10s. 6d. per bottle."

I have in my cellar thirteen different kinds of wine, of my own making, which are now twenty-two years old. This may serve to prove their durability. Instead of falling off in flavour since they were made, they have greatly improved, not only in my opinion, but in the opinion of others, who are considered to be competent judges. And I have no hesitation in saying, that they will go on improving in quality for many years to come. Indeed they seem less liable to be deteriorated by age than Foreign wines. I have found the advantage great in making a large quantity of wine at a time, instead of a small one. The larger the quantity of fermenting juice, the nearer to perfection will be the wine. It is impossible to decompose the whole of the sugar when made in a small quantity, but this can be accomplished when made in a large one, and the wine will be in every respect greatly superior. It seems to be an established law of nature, that the more *equable* the temperature is, with the greater facility will the *must* pass into the state of vinous fermentation, and constitute the most perfect wine. But of this more hereafter. Economy is another inducement for making wine in a large quantity. Providing the fruit season is favourable, and the sugar reasonable in price, it may be a saving of 25 per cent. in the manufacture, as fruits in a dry season will yield more saccharine matter by one-fourth than in a wet one. By taking advantage of the favourable season, should the following year prove unfavourable, we are provided with a supply, and the disappointment will be comparatively trifling. Even should we have been so improvident as to have remaining only what we made formerly, still we can afford to delay our operation for another season.

The nature and quality of such of our fruits as are calculated to make wine have been ably demonstrated, and rules laid down relative to the complicated process of fermentation, by Dr. Macculloch, in his admirable work upon this subject. Little remains therefore for me to say. The truth of his assertions must be obvious to those who have studied his work attentively, and who are anxious to excel in this art. To such of my readers, however, as have not perused his treatise, I would offer a few remarks. The reason why our fruits are not so well adapted for the making of wine as the grape, is, that they are possessed of a redundancy of malic acid, and are deficient in saccharine matter. Malic acid is an ingredient, which, wherever it abounds, is injurious to wine. The grape, as if alone intended by Providence for wine, on the other hand, possesses all the necessary requisites, and has only a very small portion of this acid. Could we destroy it either before or after fermentation, our wines would be very little inferior to those made in France and other wine countries, but not until then. It does not appear that any one has yet been able to neutralize this acid, although various experiments have been tried. But considering the wonderful and highly valuable discoveries in modern chemistry, and the increasing knowledge in every branch of science, we do not yet despair of its being effected. Perhaps, from the unqualified prejudice entertained against our domestic wines, the attention of scientific men has not been so much directed to the consideration of this circumstance as its importance deserves.

I have been surprised that neither government nor any society has encouraged the manufacture of wine, the Caledonian Horticultural Society alone excepted; and it also has grown cold on the subject, for it has ceased to offer any premium. But more especially does it surprise me, that the Highland Society of Scotland has entirely overlooked this matter; a society which has for its express object the encouragement of manufactures and agriculture, and which awards prizes annually to those who excel in bringing forward the best specimens of art or of produce. In a national point of view, the complete want of encouragement is greatly to be lamented. I may venture to affirm, were the Highland Society to extend its premiums (with a gold medal) to home-made wines, the mode of neutralizing malic acid would soon be discovered, and our domestic wines would acquire a different name, and a different quality, and would come into general use, and the compound called foreign wine would gradually disappear. In the year 1825, I wrote to my friend, the late Gilbert Innes, Esq. of Stow, at that time Treasurer of the Highland Society, on the subject of domestic wines and Scotch porter, and was sorry to receive the following reply:

"*Edinburgh*, 29*th July* 1825.

"DEAR SIR,

"There will not be any meeting of the Highland Society for some time to come. When there is, your letter shall be laid before the Directors; but I do not imagine they can offer premiums either for Scottish brewed porter, ale, spirits, or wine. These, from the consumpt of agricultural produce, are connected in some measure with the objects of the Society, but our funds are not sufficient for other premiums than those already advertised. I am obliged to you for * * * * * * * * * * * I am, with much esteem and respect, my Dear Sir, your obedient servant,

(Signed) "GILBERT INNES."

I do not wish to endeavour to make my readers suppose, that any of our fruits (grapes excepted) are calculated to produce such perfect wines as those grown in a warmer climate. Even from grapes, although such wine may be perfect, it will be without that aroma which characterises some of the French wines. And let it be clearly understood, that this treatise is not intended to lay down rules for the manufacturing of wines equal to those of the foreign grape, but to make a perfect, wholesome, and de licious wine, at one-half of the price of the mis-called "*Good Genuine Port or Sherry,*" or one-fourth of the price of *the delicious home-manufaced Claret and Champagne* before mentioned. The error into which the makers of domestic wines generally fall is, to use too much sugar and spirits, and, as before observed, to pay little or no attention to the fermentation, which is the most essential part of the process. General rules may be laid down, but they do not apply under all circumstances, as Dr. Macculloch justly remarks, "I cannot too strongly enforce the necessity of familiarizing ourselves with general principles, which alone can assist us through the obscure paths which this, as well as every art connected with chemistry, is obliged to pursue. And it is the address displayed by the artist in converting these general principles to his changing processes, that will give him a certain pre-eminence over those who are governed by invariable rules. In fact, however these rules may appear fixed, they cannot be generally applied, because, under the mutable circumstances in which the application is made, they must frequently be rendered futile, and sometimes even injurious."

Notwithstanding all this, we find that every housekeeper has got a book filled with receipts ; and almost every cookery book, with a variety of other books on this subject, contains full (but erroneous) methods of making many kinds of wine. Even of the books which are published professedly to guide and direct us in the making and managing of British wines, &c., the generality are filled with receipts, not only erroneous, but truly ridiculous. I may quote one or two from a book of this description, entitled, "THE INNKEEPER'S AND BUTLER'S GUIDE, or a Directory for making and managing British Wines, &c. Fifteenth Edition, revised and corrected." It may be edifying to quote, verbatim, the author's postscript to the preface of this very lucrative work, if it had no other merit. "The encouragement given to the Innkeeper's Guide in the sale of fourteen editions, the numerous applications (for more) from people in the trade, and others, and the great satisfaction expressed by the purchasers, are the reasons for sending out a fifteenth edition."

It is not necessary to go about to select receipts for their absurdity, therefore, I will begin with the first—

ENGLISH CLARET.

"Take six gallons of water, two gallons of cider, and eight pounds of Malaga raisins, bruised; put them all together, and let them stand close covered in a warm place for a fortnight, stirring it every second day well. Then strain out the liquor into a clean cask, and put to it a quart of barberries, a pint of the juice of raspberries, and a pint of the juice of black cherries. Work it up with a little mustard seed, and cover the bung with a piece of dough: let it stand at the fire-side for four days; then bung it up, and let it remain a week, and bottle it off. When it becomes fine and ripe, it will be like common claret.

N.B.—This must be kept in sand."

English Port.

"Take eight gallons of good Port wine, and put it into a clean sixty-gallon cask, first fumed with a match: add to it forty gallons of good cider, and then fill the hogshead with French brandy. The juice of elderberries will give it the proper degree of roughness, and cochineal will communicate to it a fine brilliant colour.

N.B.—In lieu of cider, use turnip juice, or raisin cider, and instead of French brandy, English brandy."

By following any of the rules laid down in such books, it will be pure chance if you are successful in making any kind of wine at all, and it will be ten to one if it is drinkable. This is the sole cause why the reputation of our domestic wines is so very bad. The makers of these receipts have never taken into account, that a warm dry summer will produce fruit with nearly one-fourth more saccharine matter than a cold wet one. Neither do they consider, that there may be a difference of $2\frac{1}{2}$, 5, and it may be $7\frac{1}{2}$ per cent., even in the value of their sugar. Therefore, by following any fixed rules regarding the quantity of sugar or fruit, without taking into consideration those casualties, you may have one year a *must** of 20 or 30 per cent. of less gravity than that of another. What is the consequence? The wine made in the good year is strong and luscious, and yet not good, for it is generally only half fermented: that made in the wet season is a poor, thin, sour drink, not worthy of the name of wine. The quantity of juice in the wet season is, I admit, greater than in the dry, but the quality is greatly inferior. The fruit contains a great proportion of moisture, which the sun has never had influence enough to absorb.

One of the principal objects of this treatise, is to lay down a simple method to guide the opera-

* By the French and other foreign wine-makers, the word *must* is applied to the juice of the grapes from the time they are squeezed until vinous fermentation has commenced and the liquor is casked, after which it is called wine. Amongst us the same term denotes the compound comprising the materials used for making the wines, from the period of their being incorporated with each other until fermentation has been nearly completed. The word *wort* signifies the extract which is obtained from malt.

tor in judging of the value of his fruit, as well as that of his sugar, to enable him to conduct the process with comparative ease and satisfaction to himself, and to secure a favourable result. The chief object which he ought to have in view, is to convert the sugar of the fruit, and the sugar in a pure state,—which he must necessarily introduce to bring the *must* up to a proper standard,—into spirit, whatever may be the quantity of wine he proposes to make. The nature of this conversion, and the circumstances attending it, form one of the most obscure departments of chemistry. That this decomposition, namely, the converting of the saccharine matter into spirit, is going on, can only be ascertained by the saccharometer, which will show the gradual progress of the attenuation through fermentation. This instrument also shows the specific gravity both of the pure juice, and the juice and water, as well as of the compound of juice, water, and sugar. To accomplish this end, portions of the *must* or compound must be taken out daily to be weighed by the instrument. I would strongly recommend those of my readers who are winemakers, and who are really desirous to excel in this art, to record the results of their daily examinations in a book kept for the purpose, that these may serve as guides to them in their future operations. It must be obvious to every reflect-ing mind, that without a knowledge of the fermentable matter one has to work upon, all attempts to obtain uniformity of wine must be unavailing. The saccharometer, with the method of using it, I will afterwards describe.

I have used it upwards of twenty-two years, and without its aid I never could have made wine of any description. I use it, first, for finding the specific gravity of pure juice; secondly, of the pure juice with water; and, thirdly, of the compound of juice, water, and sugar, bringing the *must* up to the intended standard. Thus, having a compass to steer by, I add to or decrease the quantity of sugar or pure juice necessary for compounding every year a *must* of the same quality.

The pure juice of the currant in a dry warm season, when the fruit is grown in a well cultivated garden, and when dead ripe, will raise the instrument to 60. However, it varies a little from 50 to 60. In a cold wet season the juice of the fruit, from the very same bushes, will not raise the instrument above 45, and sometimes not above 40.

Such gravities as the above, without the assistance of sugar, will be greatly insufficient to make a fermented liquor, except of a very meagre quality. Some people who have not duly considered the subject have asserted, that sugar is unnecessary in the composition of domestic wine, providing pure juice is used. I was myself formerly inclined to favour this opinion; but have discovered, from the failure of many experiments, that it is absurdly erroneous, a mere chimera indeed; and the result has convinced me, that the more sugar that is used, so that it does not exceed 4 lbs. to each gallon of the juice, the more generous will the wine be, and the longer will it keep, provided the attenuation be complete, which I repeat is impracticable where the quantity made is small. The more sugar that is employed, the less water is necessary to add to the juice; for the essential ingredient,—that is, natural leaven or yeast—is held in solution in the juice, by the help of which the sugar can alone be converted into spirit without artificial means—a means which should never be resorted to, unless in extreme cases. By putting too much water into the juice you deteriorate the leaven, the consequence of which will be, that much of the sugar will remain in an unaltered state, giving rise to a wine disagreeably sweet, sickly, and without sprightliness, and completely destitute of that vinous character which it ought to possess. Hence much of the prejudice entertained against home-made wine is not without foundation.

The inference that we ought to draw from these circumstances is, that there should be some precedent to direct us regarding our standard gravity. I have found from experience, that in order to make a strong, generous wine, a *must* should not be under 115, although 120 is better, excepting for champagne, when 105 to 110 will be quite sufficient. Taking it for granted that the standard is 120, and that the fruit in a good year will give on the average a gravity of 55, the deficiency then will be 65. This deficiency must be made up by sugar to 120 the standard. In a bad year the fruit will not yield what it did in the good one, as before noticed. The deficiency of gravity will be greater, which the instrument will indicate. The pure juice must then be more and the water less, when water is used, which is always advisable; and besides, more sugar will be necessary to bring the *must* to the standard 120.

The common rule for making wine is, to use a greater weight of water than of fruit. My rule is, to put, on the average, equal measures of juice and water. This, perhaps, in a very favourable season, may be a little too much, especially if the quantity intended to be made is great. One-third juice and two-thirds water will perhaps be a good proportion, especially if the wine is to be soon used. This alone must depend upon the quality of the juice. It is, however, always best to err on the safe side, for the stronger the juice is, the better will be the fermentation. Let us suppose, then, that in a good season, we find, on examination, the pure juice to be 60, or any number under; by putting an equal portion of water as juice, providing it is at 60, the liquid will be reduced to 30. Let us fix, then, upon this weight 30 as our standard, whether the season be favourable or the reverse. In a good year equal portions of juice and water will produce this gravity. In a bad one, the pure juice will probably admit of only one-third water. In this last-mentioned season, we may find by the instrument that the pure juice yields only 40 instead of 60; consequently, by adding the same measure of water as juice, we shall only get 20 instead of 30, making a deficiency of 10. This deficiency must be made up (after the discovery in the pure juice), by adding a greater proportion of pure juice to the water until it rises to the proposed gravity 30, keeping always in mind, that the less gravity and quantity of pure juice our fruit yields, the less fermentable extract, *i.e.* natural leaven, we shall have to carry on our fermentation. Sugar and water, it should be premised, will not spontaneously ferment without a proportion of that necessary leaven, which is held in solution in the juice of the fruit, or without using artificial means, such as brewer's yeast, or some other vegetable extract. By the saccharometer, we are enabled to find the gravity or value of the juice. We have now to apply it in order to ascertain the gravity of the compound of pure juice, water, and sugar. Every pound of good Jamaica sugar, mixed with one gallon of water, when thoroughly dissolved, should give a gravity of from 34 to 36. We will assume here that the gravity is 35. Now, as we require 90 to make up a *must* to the standard gravity of 120, it will require rather more than 2½ lbs. of sugar to each gallon of *must*; for by using 2lbs. to the gallon we shall get two thirty-fives, equal to 70, instead of 90, minus 20. By the addition of another half-pound of sugar to each gallon we shall raise the 70 to 87½, being 2½ less than is required. A small portion of sugar may or may not be added at pleasure. The saccharometer will also of course be our guide in the obscure process of fermentation; for in proportion as the sweet or saccharine matter lessens, the liquor becomes more vinous and spiritous, and therefore decreases in gravity. This instrument will clearly demonstrate the progressive decline of the *must* until it is reduced to the desired point of attenuation. By regulating our fermentation by this instrument, the practice of adding spirits to our domestic wines, especially to the extent which is now practised (these being erroneously supposed to preserve or improve them), will be found quite unnecessary, as it is a well-ascertained fact, that the durability of wines is shortened by the addition of spirits, for spirits decompose and displace the carbonic acid, and prevent the wines being lively, which should be the character of home-made wine. Some add spirits for the purpose of checking fermentation, or preventing the wine from turning sour. That spirits will not prevent wine running into the acetous fermentation, unless used in very considerable quantities, has been fully ascertained. We now see that spirits are of no use to the wine for checking fermentation; and we must own, that the addition of it to that wine which has in itself perhaps too much already, will prove injurious to the constitution of the consumer, as well as an expensive ingredient to the maker. Would those who make wine, and think it will not be good without the addition of spirits, give their *must* an increase of pure juice and sugar, say 15, —ten of which of pure juice, and five of sugar, reducing these extra allowances with skill and attention, taking the saccharometer for their guide; they would, I am sure, be convinced that the general and prevailing use of spirits in wine, in any stage of the process, is unnecessary, unwholesome, and expensive.

My readers must excuse the plainness of my style here and in other parts of this work. I wish to be intelligible, that they may follow me in every example; and I am convinced that flowery language is of no use in conveying plain ideas, nor of the smallest advantage in imparting instruction in the art of making good, wholesome, generous wine.

It is my intention to divide this short Treatise into three parts; the First will be devoted to the making and management of Wines; the Second will be on Liqueurs, Compounds, and Cordials; and the Third on Private Brewing. Brewing is a science which, I may say, I have studied for the greater part of my life, having been brought up in a brewery in England from my infancy; and during several years of my life afterwards, I was managing partner in a brewery in Scotland. Therefore, the methods I shall propose as guides to those who brew their own malt liquors will not be theoretical fancies (as are those rules found in most of the works on this subject at present before the public), but well-digested conclusions drawn from practical experience. They will, I trust, be the means of conveying a perfect knowledge of the process to the operator, by which he will be enabled to brew his own ale, porter, and table-beer, with ease, economy, satisfaction, and success. In the treatise on Wine I shall enter into more minute details respecting some wines, than with regard to others, especially those in which I have been for years endeavouring to remedy the existing evil, namely, the want of a sufficient fermenting principle in the *must*, for the conversion of the large quantity of sugar, which must necessarily be employed, into a vinous liquid by a regular and consistent attenuation.

Champagne, grape, and raisin wines, have been more fully discussed than many others. The reason is, that these enjoy a more unexceptionable popularity than any other home-made wines. This arises, in the first place, from their approaching in flavour, bouquet, and appearance, more nearly than the others to foreign wines; and secondly, because they are more frequently met with at table. Perhaps another reason may be found in their really being in the abstract of superior quality. I have borrowed from Dr Shannan the French method of treating their wine:— "After the grape has been pressed and converted into a vinous liquor, the operator ought to follow, as nearly as circumstances will allow, the continental method of treatment; for the more nearly he attains to this method, the more nearly will his wine approach in every respect to the continental wine he intends to imitate." Regarding the treatment of the unripe grape used for Champagne, I have adopted Dr Macculloch's scientific method, which, with the aid of the saccharometer, will enable the artist to produce a wine of very superior quality, excelling four-fifths of that which is sold in this country for eighty-four shillings per dozen. To supply the deficiency of sugar in our native fruits, I have found *wort* from malt more beneficial and economical than any other basis, especially when beer is made from the good yet remaining in the malt, after a sufficient quantity of *wort* has been extracted for the making of the wine. The first running of the mash is richer, and contains much less mucilage than the second. In fact, it is only the first running that is fit for the wine; consequently, after you have obtained all the extract which this first running gives, much fermentable matter still remains—invariably to the extent of about one-half. This is capable of making most excellent beer, equal to that sold in Edinburgh for two shillings and sixpence per dozen. A weak extract of malt wort, brought up by sugar to the gravity of 130, is still a better, but a more expensive, basis than the former; but even by this method a saving of 20 per cent. is made; and wine which has been manufactured with either of these foundations, if consistently fermented, will possess more softness of flavour and spirituosity, than wine whose basis is composed of sugar alone; for the mucilage contained in the *must* will induce a steady and uninterrupted fermentation. A bushel of good malt is as valuable to the maker of wine and beer as 24 or 26 lbs. of the best Jamaica sugar. Good malt is generally about 7s. or 8s. a-bushel, sugar from 6d. to 7d. per lb.; there is therefore a saving of upwards of 40 per cent. in using malt. Malaga raisins is another basis, which may be employed with great advantage—a basis from which all manufacturers of home-made wines for sale obtain their saccharine matter, as well as those who adulterate foreign wine, or imitate it by employing a home-made material as the principal constituent of their compound, and making it resemble the foreign article by an admixture of deleterious ingredients.

Wines made from roots, flowers, &c., such as parsnip, beet, ginger, cowslips, clary, elderflowers, &c., which in their composition have little of the natural leaven, an ingredient so essential to fermentation, require extract of raisins, with a minute portion of sugar. Raisins possess this in a high degree, and will ferment spontaneously; whereas, if sugar was used alone, an artificial leaven must be employed.

It is my opinion, all our domestic wines should be made with a portion of raisins and sugar, or malt and sugar, or a combination of malt, raisins, and sugar; the liquor extracted from which will be found not only greatly ameliorated, but the quantity of alcohol increased.

There is another basis for the production of British Wine, that is formed from the starch made from potatos. This starch is convertible into a syrup in a very simple and easy manner. It has been proved, that one hundred pounds of potato starch will produce seventy-five pounds of saccharum, as valuable to the wine-maker, as the same weight of sugar. It has also been ascertained, that if the process has been properly conducted, at least eighteen pounds of starch will be obtained from one hundred pounds of potatos. The method employed formerly to convert the starch of potatos into a syrup, was by mixing it with sulphuric acid very much diluted; but recently—about ten years ago—the French chemists discovered a very curious substance extracted by cold water from crushed barley malt, and precipitated from the infusion by pure alcohol. This substance they called Diastase, and found, if it was obtained pure, it had such power, that one part of it to two thousand parts of starch was sufficient to convert those two thousand parts into sugar. As this book is intended only for private families and amateur wine-makers, I will not enter into the detail of the different processes employed in obtaining it in its pure state, but merely conclude by observing, that out of one hundred parts of malted barley, only one part of this substance "Diastase" can be obtained. Without further comment, I proceed to give directions how a beautiful syrup may be obtained from potato starch, which, as it is possessed of much natural ferment, will prove a very valuable auxiliary to the *must.*

To make this starchy syrup basis, a water-bath is required; and assuming we are to use fifty pounds of starch, two hundred pounds in twenty gallons of water, must be put into the bath and warmed from about 77° to 80°. For this quantity of starch, namely, fifty pounds, eight or nine pounds of barley malt finely ground, are well mixed with the water in the bath, and afterwards the temperature is to be raised to about 140°. The fifty pounds of starch are then to be thoroughly mixed with the water and barley, when the heat is again raised to about 158°, and is to be so regulated that it shall not fall under 149°, nor rise above 167°. In a very short time the mass will become gradually thinner, and in the space of an hour it will be almost as fluid as water; while, at the same time, the greater part of the starch will have become sugar, and by being evaporated, the syrup before described will be obtained.

As I am anxious that the present edition shall not be excelled by any work on the subject, I propose taking the liberty of making several extracts from a valuable paper by Dr. Macculloch. As this document is only in the hands of a few individuals, any extract from it must be acceptable.

Dr. Macculloch, after a few preliminary remarks, proceeds thus :—" The constituent parts of the fruits used in the experiments now under consideration, are malic acid, either in a state of purity, or one of combination with potash, (a circumstance not yet perfectly ascertained,) vegetable mucilage, or extractive matter, supertartrite of potash, sugar, water, the sweet principle, the colouring principle, tannin, superoxalate of potash, and the principle of flavour." Dr. Mucculloch goes on to show, that the proportions of these substances vary very much in different fruits; and indeed in some, one or more of them are entirely absent. He gives an example of this, in the white currant, where the colouring substance is deficient, while, on the other hand, it abounds in the elderberry, and in the black grape; he however states, that among the principles enumerated, " tartar, water, sugar, the sweet principle, and the vegetable extract, or mucilage, are the most essential in the conversion of fruits into wine. The colour and flavour may be considered as adventitious;

and the principles that yield them are in nowise essential to the process of wine making."

"Tartar" is the first of these substances, which, he says, "seems essential to the formation of a genuine, vinous liquor, and an addition of it where it is naturally wanting, is found not only to ameliorate the produce, but even to increase the quantity of alcohol, which a given proportion of sugar and the vegetable extract are capable of producing. Fermentation is more easily induced where this salt is present, and the experiments of some of the French chemists, seem to show that it is decomposed during this process. Their opinion, that it is converted into the malic acid, is unquestionable. The presence of tartar is the circumstance which most strongly distinguishes the grape from all the fruits which have been applied to the making of wine. In this fruit it exists in the greatest quantity before ripening, and a portion of it disappears during this process. From this peculiarity of the grape, the practice has been introduced of mixing tartar with those washes which makers of sweets intend for the basis of their wines; and from it I have also derived the practice of mixing tartar with those native fruits which are deficient in this substance; a practice which has been attended with the best results."

Malic acid is the next substance he notices, at the same time stating, that most of the native fruits abound in it, and consequently our home wines partake more of the nature of cyder than of wine; he suggests whether some chemical process might not be adopted to destroy a portion of this acid either before or after fermentation.

Sugar follows malic acid, and he proceeds :—

"Of all the substances which are called into action, during the process of wine making, *sugar* must be considered the most essential, being that on which the strength of the wine depends. Those fruits which contain the greatest proportion of sugar, furnish the strongest wine; the alcohol generated in the act of fermentation being alway found to bear a proportion to the pre-existing sugar. The principal defect in our domestic fruits is the small proportion of sugar which they contain; but it is at the same time that which we are most easily able to remedy; and it is on this basis indeed that the whole system of our domestic wine manufacture is founded. But even in this part of the process difficulties occur, and lead to the imperfect fermentation of these wines, and the subsequent sweetness by which they are too often characterized." The Doctor then shows that it is considered the saccharine matter exists in vegetables in two distinct states, that of pure sugar, and that of the sweet principle, but that it would be more correct to consider sugar as an artificial substance formed by chemistry from the sweet principle, the only state in which sugar exists in vegetables. The sweet principle does not crystallize, but with the addition of water it will run into fermentation. On the other hand, sugar crystallizes with facility, but has no tendency to ferment, except it contains a portion of the sweet principle. "If a solution of pure sugar in water be allowed to repose, it crystallizes without fermenting; nor does even the residuary syrup, or mother water, as it may be be called, undergo this process."

* * * * "These varying proportions of the two substances under consideration, are the cause of the various effects, which are observed in the results of fermentation in different fruits. If the sugar predominates, the wine will be sweet, unless expedients are used to complete the fermentation of the sugar, and convert the whole into wine. If the sweet principle is most abundant, or to speak more correctly, if there is much vegetable extract combined with the sugar, the fermentation will be complete, and the wine dry, unless artificial means are used to prevent this effect.

"Among the enumerated ingredients of fruits, the *vegetable extract* naturally falls next under consideration. Although this substance has not been analyzed, we know that it differs from mere vegetable mucilage." * * * "In many vegetables, and conspicuously in the gluten of wheat, it exists" (vegetable extract) "in great proportion. It is for this reason that wheat as well as rye, act powerfully as ferments. It is also found in many flowers, in that of the elder for example,—in the leaves of the vine—in the grape—in the gooseberry—and in many other fruits as well as leaves. This substance, then, is the true natural leaven of fruits, or that by which the sugar which they contain is rendered capable of undergoing fermentation: and in the artificial process of vinification, which is the subject of this paper, it is to this substance that we must look for the conversion into wine of that sugar which may enter into the compound.

"Water, enumerated among the principles of fruits, simple as it may appear, is a substance requiring consideration. If the proportion of water be too small in the liquid subjected to fermentation, that process is with difficulty either established or maintained." This occurrence never takes place, but in those countries where the juice of the grape is boiled, or where the fruits before pressing, are allowed to undergo a partial desication. When this is the case, the wines having only been half fermented are excessively sweet, such as those of Cyprus, and several of the ports on the shores of the Mediteranean. It is asserted, that the famous wines called Tokay and St. Lucar, possess their indescribable fine flavour and richness, from a partial use of this mode.

I will now pass over the colour and tanning of these wines, and proceed to give a short extract from the Doctor's last principle—that of flavour. "Flavour is so uncertain and fugacious, that it is difficult to establish any general rules regarding it. The finer flavour of the superior wines, such as Claret, Hermitage, and Burgundy, have no resemblance to that of the fruit, but are the result of the vinous process. In the manufacture of many wines, recourse is had to flavouring ingredients, such as orris-root, grape-flowers, almonds, mignonette, &c. If the flavour of fruits could be transmitted with certainty to the wines, we might expect similar results from the strawberry and raspberry; but the effect of fermentation is generally such as to volatilize or destroy this delicate principle; hereafter I shall point out a probable method of obtaining this object."

Dr. Macculloch, near the close of his letter, makes the following remark with reference to the foregoing.

"These ingredients which are added for the above purposes of flavour, have been managed with similar want of judgment, and they have indeed often been supposed capable of communicating the strength of vinous quality to the liquor. Instead of being introduced at the decline of the fermentation, they have been exposed to all its effects; in consequence of which, their flavour has often been volatilized or destroyed. This is the case with cowslip wine, where an enormous quantity of flowers is used, to obtain an effect which might be procured with a much smaller allowance. Such also is the practice with raspberries,—a practice worth noticing, since it affords an opportunity of stating the more correct and useful mode of proceeding. If an attempt is made to form wine from raspberries and sugar, a liquor will be produced with little or no flavour of the fruit; but a small quantity of syrup or juice of the raspberries added at the decline of the fermentation, or a little fresh fruit suspended in the cask at the same period, will be sufficient to communicate a taste, more likely to prove excessive than defective."

Dr. Macculloch, in this paper, commences his description of the process of wine making with fermentation, and I again take the liberty of quoting a few extracts:—

"If a knowledge of the circumstances which attend and modify the intricate process of *fermentation*, be necessary in the making of wine from the grape, it is still more requisite to investigate the various accidents and causes which may affect it, when the substances, exposed to the action, are, like those used in our domestic manufacture, artificially compounded. It is thus only that we can hope to establish such general rules, as may be applicable to those ever-varying causes, where particular rules of practice would be unattainable. A general notion has already been given of the substances, to whose mixture the process of fermentation is owing, and the essential ones will be found to consist of sugar, vegetable extract, tartarous and malic acid, and water. These are indispensable, and to their varieties in proportion, some of the most remarkable differences in the results of fermentation will be found owing. Among these, sugar is the most essential, since the alcohol of wine is more particularly derived from the decomposition of this substance. The strength of the wine is proportioned to the quantity of sugar fermented, and the most saccharine juices, therefore, afford the strongest wine, or in the artificial process, if so it may be termed, that compound to which the greatest proportion of sugar has been added, will be capable of giving the strongest if duly managed."

"Here, then, we have the theory of the process. It consists of mixing with a solution of fine sugar in water, a certain proportion of this unknown substance, which, to distinguish it from common yeast, I shall hereafter call by the name of *leaven*. It is on the proportion, quality, and management of the leaven, that the most important consequences in vinification depend."

This ingenious author, after entering a little into the description of the natural leaven of fruits, the yeast, and lees from the artificial leaven, proceeds—

"It will, from these considerations be evident, that if certain proportions of sugar and of leaven, whether natural or artificial, be taken, and the process of fermentation be suffered to proceed to its natural termination, the result will be a fluid perfectly vinous, containing neither sugar nor acid. If the proportion of leaven be deficient, the produce will contain unchanged sugar; and the same effect will take place if the fermentation be prematurely stopped by artificial means. If, on the contrary, the leaven is in excess, or the fermentation has been designedly protracted by artificial means, a new product will be formed, and the whole, or a portion of the alcohol, will disappear, and acetic acid will be found in its place. Sweet wine, therefore, is an imperfect wine, or one in which the leaven has borne so small a proportion to the sugar, as to have been incapable of converting the whole into a vinous liquor. This is the case with our domestic wines, when a large quantity of sugar is added to so small a proportion of fruit, that the compound does not contain natural leaven enough to convert the whole into wine. This evil may be corrected by the use of the artificial leaven, *yeast*, but the quantity added is generally inadequate to this object. It is from this cause that makers of domestic wines so often attempt in vain to produce dry ones. When this is attempted by diminishing the sugar, the result is a liquor, both feeble as a wine, and, at the same time, tending strongly to the acetous fermentation. If, on the contrary, recourse is had to an increase of the yeast, the consequence is an increase of the bad flavour, which this substance almost invariably communicates. The true remedy is so to balance the vegetable juice and the sugar, as to produce a fluid analogous to the juice of the grape, or one in which there shall be a proportion of natural leaven, sufficient to convert the whole of the sugar into wine.

"I cannot too strongly caution the artist against the use of the common and pernicious practice of exciting the fermentation by the *yeast* of beer. I have already made it appear, that when a due proportion exists between the leaven and the sugar, either in a natural or an artificial fluid, a regular fermentation takes place, and a perfect conversion of the whole into wine. If an artificial yeast is ever wanted, it may be found in the lees of wine, in which it is mixed with tartar, or else it may be reserved from the fermentation of former parcels of domestic wines. * * * The juices of our fruits are known to be deficient in saccharine matter, and experience has long established the well known remedy—that mixture of common sugar on which the whole art depends. But it has not generally entered into the views of the makers of wine, to supply this other important defect, although the means are equally easy." (The Doctor here alludes to tartar.) "The makers of *sweets* are indeed acquainted with it, although, from the defective nature of their process in general, it has not produced in their hands the effects which might have been expected. Their principal error consists in the use of yeast and molasses,—articles whose vicious nature is incorrigible ; but in the experiments I have directed to be made on this subject, ample reason has appeared to consider the addition of tartar to the juices of our fruits as a valuable improvement in the art of making domestic wines. In the use of this ingredient, tartar, no very accurate limit seems necessary, since the wine of the grape may generally be considered as a saturated solution of tartar; and I may add, that by using crude tartar instead of the purified salt, we derive other advantages from the leaven contained in the lees attached to it."

* * * "I may pass lightly over the phenomena which occur during the process of fermentation, which, however important to a general view of this subject, are, from their minor share of practical interest, more easily dispensed with, than those details which are necessary to the unphilosophical practitioner.

"The art of fermentation is marked by the extrication of air-bubbles, and by the agitation and turbid appearance of the liquor. The turbid matter is shortly separated into two portions, which in part, rise to the surface in scum, and, in part, subside in the form of lees. Both of these, as I have before shown, have the power of continuing the act of fermentation; and it has also been shown, that their separation, by decanting and clarifying, serves to check this process. For the same purpose, the cask is kept always filled to the bung-hole, so as to admit of the disengagement of the scum or yeast as fast as it is formed. The bulk of the liquor is increased during fermentation, partly in consequence of the heat excited, and partly from the extrication of the carbonic acid gas which is separated. It will be obvious, how the practices required in regulating the qualities of all wines, must be deduced from this general fact respecting the management of the yeast during its production, and that the manipulation must be different when either a sweet or brisk, or a still or dry wine is desired. In the former two, the fermentation will be checked by filling to the bung-hole; in the latter, the yeast will be allowed to subside.

"The last and most important effect of fermentation, is the *formation* of *alcohol* or *spirit*, and this depends collectively on the proportion of sugar in the entire fluid, on the due proportion of the leaven to that sugar, and on the perfection of the fermentation. The whole of the sugar is seldom decomposed during the first process of fermentation; but a proportion is generally attached even to the wines considered dry, long after they are tanned or bottled. It is only by a slow continuation of the same actions in casks and bottles,—a process often requiring many years for its completion,—that the sugar entirely vanishes, and the liquor is found to consist of alcohol, combined with the other matters which join it to form wine. It is important to consider the effects produced on wine by a portion of undecomposed sugar remaining in it. As long as this exists, the acetic fermentation cannot take place, and it therefore offers a test of security against this result, in all our ill-made domestic wines. In the natural wines, the balance of principle appears to prevent this occurrence, even when all the sugar has disappeared; and thus Hock, Claret, and Madeira seems to be possessed of the power of endless duration. * * * *

I must now describe the artificial means by which fermentation may be checked or stopped in those cases where a natural termination would not occur. Those most generally used, are racking and fining, of which the object and effects must already be intelligible to those who have read the preceeding remarks. Turbid wine is in an unfinished state, as well as in a precarious one, and its brightness and purity is not merely an ornament, but a property necessary to its permanence. It is from being left in this state, that wine frequently becomes *pricked*, this disease being the first stage of the acetous fermentation, but one which may also originate in other causes already explained. But although racking and fining may disengage the wine from all precipitated leaven, it will not separate that which is held in solution, and of which the tendency is equally to destroy the wine at some distant period. For this purpose, chemical means are required, and the process in common use, is known by the name of sulphuring. Many unnecessary and complicated methods are resorted to for this end; the most simple is equally effectual, and consists in filling the empty casks with the vapour of sulphur, from burning matches placed in the bung-hole. The wine is then introduced into the cask, and if this first operation is found insufficient, it may be repeated as often as is necessary."

The Doctor then proceeds by asserting, that it is a mistaken notion that our domestic wines, which are made from *musts*, judiciously proportioned, are improved and rendered more durable by the addition of brandy or spirit. On the contrary, he asserts, that by the addition of spirits, the sprightliness of the wine is impaired, and its durability lessened; and again, that spirit, unless added in a very large quantity, has no tendency to check fermentation, nor prevent the wine from running from the vinous to the acetous state. He then proceeds to enumerate the fruits which are used for the fabrication of our domestic wines; after which he adds—

"A wantonness of experiment seems to have, in some measure, led to this great and superfluous number of articles as the nominal basis of wines, although the practices have also been in a great degree founded on false views of the real nature and objects of this manufacture. It is evident, on the principles already laid down, that when no peculiar and agreeable flavour follows the adoption of any individual fruit, it can have no legitimate claim for use, beyond that which is founded on its several properties of sugar, leaven, acid, colour, or astringency. As the two last of these can be communicated with the greatest certainty, by adventitious ingredients, it is bad policy to have recourse to weak expedients for the same, and particularly, if, for the sake of these minor objects, we must sacrifice others of greater importance.

"Since also the sugar is confessedly, and in all cases, an adventitious ingredient, capable of being proportioned with the greatest nicety, completely in our power, and of a moderate price, it is unnecessary to consider that ingredient in fruits, as the one which is to guide our choice. It is the due admixture of acid, and of leaven, (the fermenting principle,) that we are chiefly to look for the causes which are to determine us in our selection. If a good flavour can be obtained from any fruit of our own growth, we have then the whole data which should rule our determination."

He farther proceeds to carry out his views :—

"From the Strawberry, wines of an agreeable quality, both dry and sweet, may be produced;

but the peculiar flavour of the fruit is generally dissipated in the process. The cautions which I have given respecting flavour, will suffice to point out in what way that is most likely to be obtained.

"I make the same remark on the Raspberry, with this additional hint, that as very little in point of flavour or produce is gained by the use of these fruits, which are in most places of a high price, it behoves the operator to balance the advantages against the disadvantages, before he enters on the undertaking. A simple infusion of this fruit, as before noticed in any flavourless currant wine, will with greater cheapness and certainty, produce the desired taste."

The Doctor slightly notices various fruits from which wines are made. The Sloe, Elderberry, Damson, Blackberry, Gooseberry, and the three varieties of currants, but as I have expressed before my intention to make short extracts, I shall confine myself to the Orange and the Currant.

"As the orange and lemon, although not native fruits, are familiar to us, and scarcely differ in their chemical composition, I may safely consider them in one view. So little difference exists between the citric acid which is found in these fruits, and the tartarous which characterizes the grape, that it is natural to expect their produce to be of good quality. They are, however, deficient in extractive matter or leaven, and for this reason are incapable of being converted into wine, even with the aid of sugar, unless yeast or some other leaven be added. As it is impossible to add the yeast of beer in sufficient quantity for the perfect fermentation of the fluid, without spoiling the flavour, these wines are generally imperfect and sweet. They are likewise almost always corrupted in their flavour, by the infusion of the peel giving a taste, which, however grateful abstractedly, does by no means coalesce with the taste of wine. It would tend to the improvement of these wines, if the peel were to be omitted, and if any vegetable matter could be added capable of inducing the complete fermentation, without communicating a bad flavour. I have attempted it by means of gum, and with partial success. The principles I have already pointed out, will leave experimentalists to the search of proper substitutes for the natural leaven. It is not unlikely that they would be found in wheat; either in the flower or gluten."

* * * "The three varieties of the currant, are perhaps even better known, and more in use as ingredients in wine-making than the gooseberry; and as the produce of each is attended with some difference, I shall notice them separately. Both from the *white* and *red* sort, wines are made, which differ principally in colour, but also very

slightly in flavour, though the flavour of neither is very characteristic. I have ascertained by repeated trials, that a principal defect in these wines, as commonly fabricated, arises from the sparing proportion in which the fruit is used, which otherwise contains a sufficient quantity of natural acid as well as of extractive matter, to ensure a perfect fermentation, if properly managed. Partly from this cause, as well as from the imperfect management of the fermentation, these wines are usually made sweet. They are also, not uncommonly, nauseous, as well from the combination of a natural bad flavour with this mawkish sweetness, as from the other improprieties of management before noticed. By increasing the quantity of fruit, (which is generally proportioned like that for gooseberry wine, namely three pounds of sugar, and four of fruit to eight pounds of water,) and by avoiding the use of the husks, the flavour is materially improved, and the quality of wine further ameliorated, the fabricator at the same time acquiring the power of making his wine sweet or dry; whereas, according to the present mode, he is generally unable to produce the latter variety. The natural tendency of this fruit is to form wine analogous to the lighter white wines of the grape, and it is a rational object to follow the tendency which is pointed out by the nature of the fruit.

I have also reason to think that much advantage would result from the use of tartar in this case, by which, among other defects, the ammoniacal taste, so common in this wine, seems to be prevented. The proportion of tartar need not be specified, as it has been mentioned before, (from two to four per cent,) and that of sugar is to be regulated by the principles already laid down. With careful management, wines are thus produced from currants not easily to be distinguished from the Colares of Portugal, which, although not in the first class of wines, is certainly superior to most of our domestic manufactures. A considerable improvement may be made in the fabric of all those wines produced from fruits, of which the flavour is either bad, or which possess no flavour at all; and this is, by boiling the fruit previous to fermentation,—a practice which I have caused to be adopted in currant wines with decided success. From this treatment, many tasteless fruits acquire a flavour, as is well known, and many bad flavours are converted into agreeable ones. In no case, perhaps, is this more remarkable, than in the *black currant*, which, harsh and comparatively insipid in its natural state, acquires, by boiling, a powerful, and to most persons, a highly agreeable flavour.

"In making wine from this variety of currant, the effects of this process are very remarkable, the produce of the raw fruit being scarcely distinguished by any particular property from the herd of domestic wines, while that of the boiled fruit may with careful management be brought to resemble some of the best of the sweet Cape wines. In the white and red currant, the same precaution has been attended with results equally successful, though not marked by a contrast so decided. To what extent the practice of boiling may be tried with advantage, I do not know; but I may venture to point it out as an improvement worthy of future investigation."

So far have I carried the reader in my introduction, and I trust not without profit to him. I now beg him to follow me through the modes of making and managing a variety of wines, hoping that he will derive advantage from the perusal of this work; but before I proceed, I shall now, as before noticed, give a description of the saccharometer, as well as a table of specific gravities of the fruits, roots, and flowers, fit for wine-making, so that the operator may make up a *must*, by referring to it, with the greatest ease.

DESCRIPTION AND USE OF THE SACCHAROMETER.

This valuable instrument, which has become the brewer's compass, is of a very ancient invention, and is said to have been in use as far back as the beginning of the seventeenth century. It appears, however, that its use was not generally known, until Mr. Martin, about the year 1768, constructed his, which he advertised, as Mr. Richardson ironically tells us, "as useful for discovering the strength of domestic liquors, such as beer, ale, punch," and so on. Quin, Richardson, Dring and Fage, Diccas and others, followed Martin. Since that time many saccharometers have been constructed, each claiming a superiority over the rest. But Dr. Thomson, who was one of the three individuals selected by government to inquire into the differences in value between the English and Scotch barleys and malts, in his report, has shown that these instruments, are almost all mathematically incorrect; and he has himself accordingly invented one which is made by Alexander Allan of Edinburgh. The before-mentioned instruments, especially that of Diccas, are made to show the number of pounds of extract contained in thirty-six gallons of water, each pound of which extract occupies the space of .06 of a gallon of water. Dring and Fage's shows merely the increase of gravity caused by the weight of sugar put into a full barrel of water containing 36 gallons, and the difference between the weight of the sugar and the weight of the water so displaced. For example, suppose we have a barrel of water weighing 369 lbs., at the rate of 10.25 lbs. per gallon, by adding 78 lbs. of sugar, we should bring it to 447 lbs.; but by putting in the 78 lbs. sugar, we displace a certain quantity of water in order to make room for the sugar; and as we observed that each pound of sugar occupies the space of .06 parts of a gallon, so by multiplying the pounds of sugar, 78, by the space each pound occupies (.06 parts to each gallon,) we find that 4.68 gallons of water have been displaced. Deducting these from the orignal 36 gallons, there will only remain 31.32 gallons of water. Multiplying 31.32 gallons by 10.25, the weight of each gallon of water, there will then be 321 lbs. instead of 369. By adding the above quantity of sugar, 78 lbs., the excess of gravity will be only 30 instead of 78, so that a barrel of wort weighing 30 by Dring and Fage's instrument, weighs actually 399 lbs., namely, 321 lbs. of water, and 78 lbs. of sugar.

To prove the accuracy of this statement, Mr.

Baverstock informs us, "That he evaporated to perfect dryness a quart of raw wort (the extract of malt,) indicating by Diccas's saccharometer 76.5 lbs. of solid fermentable matter; and as the extract could not be completely detached from the evaporating vessel, the whole was put into the scale; it weighed 24.25 ounces. The vessel, after being perfectly cleaned with hot water, which brought the extract again to the state of wort, weighed 15.75 ounces, thereby showing that the actual quantity of fermentable matter, or solid extract, contained in the quart of wort, was 8.5 ounces, which, multiplied by 144, the number of quarts in a barrel, gives 1224 ounces, and this, divided by 16, gives 76.5 lbs."

Dr. Thomson's Saccharometer is so contrived as to show the actual specific gravity of any liquid containing saccharine matter. But as in all liquids exceeding 60 degrees of heat, the gravity will be lessened, while below 60° it will be increased, a thermometer and sliding rule accompany the instrument, that the strength of the extract may be exactly ascertained at any required temperature. This prevents the necessity of waiting till the extract is cooled down to 60°. I would advise those who wish to excel in making wine to purchase Dr. Thomson's instrument, especially if, in addition, they also intend to brew their own ale. A book of directions is given along with it. Those, however, who grudge to give three guineas for this instrument, may be accommodated with a glass saccharometer, which will indicate the gravity from water 0 to 130 as well as Dr. Thomson's instrument, but the liquid under examination must be reduced to the temperature of 60°. The price of this saccharometer, with a sample tube, is six shillings.

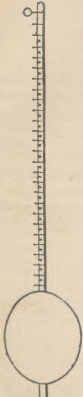
Since the publication of the last edition of this work, I have been much annoyed at repeated complaints having been made, of the inaccuracy of the saccharometers purchased from the parties named in that edition. In order that this evil may be remedied, I have requested that all applications in future for Roberts' glass Saccharometer, shall be made only through the publishers of this book, who will always have on hand a supply, which have been carefully examined and tested by myself.

The figure on the next page represents this saccharometer. It consists of an egg-shaped ball, balanced below by quicksilver, and terminating above in a tube, which contains a scale, graduated from 1 to 26. In estimating the gravity, or saccharine matter contained in any liquid, each of the greater* divisions on the scale is to

* The greater divisions, 1, 2, 3, &c. on this scale (the odd numbers, 1, 3, 5, &c. are omitted to prevent confusion,) are subdivided

be estimated as 5, while zero (0) at the top of the scale indicates the weight of water. To ascertain the gravity, therefore, of any *wort* or *must*, place the saccharometer in the fluid; multiply the degree on the scale which is cut by the *wort* by 5, and you will find the gravity;—for example, should the liquor raise the instrument to 26, the last number on the scale, multiply 26 by 5, and you have the gravity 130. Should the liquor raise the instrument only to 8, the 8 multiplied by 5 will be 40; and either of these numbers, 130 or 40, will be the specific gravity.

by dots, each of which indicates an increase of $2\frac{1}{2}$ degrees above the next greater division on the scale;—for instance, if the instrument rises to the dot below 9, the gravity will be $9\frac{1}{2}$, multiplied by 5, or $47\frac{1}{2}$. Again, should the extract be so strong that the degree 26 on the scale rises above the liquor, take equal portions of it and water and mark to what degree the instrument rises in the diluted liquor—suppose to 16; multiply this by 5, you have 80; and this doubled gives 160, the gravity of the original wort.



Specific gravity is the absolute weight of different bodies of the same bulk. A cubic foot has been taken as the standard bulk of substances, of which it is required to ascertain the specific gravity. As a cubic foot of pure water, at the temperature of 60°, weighs nearly 1000 ounces, it is considered to be sufficient for all practical purposes to call it so. When the saccharometer is put into the cylinder filled with pure water at the temperature of 60°, it will sink to 0 on the graduated scale; but when it is put into a liquid containing sugar, or, more properly speaking, holding sugar or any other saccharine substance in solution, it does not sink so low, because such liquid is heavier than water; and as the weight of any extract increases with its strength, it is obvious that the stronger the extract is (or the greater the quantity of sugar it contains), the less the instrument will sink; and the weaker the extract is, the more it will sink.

Table, No. 1.

The following are the specific gravities of the pure juice of some of our native fruits which are available for wine-making, as well as those of the pure juice of Foreign Grapes, Oranges, Lemons, Apples, &c. &c., together with the gravities of samples of Sugar, Raisins, Parsnips, Beet-root, Malt, &c. &c., as shown on the Saccharometer, when a pound of each of those substances is thoroughly incorporated with one gallon of water at 60°. With this table, and the Saccharometer, the wine-maker will have an unerring compass to guide him; and by strictly adhering to the directions given, he will be enabled, with certainty of success at all times, to produce a British wine of superior and uniform quality, and which he could not possibly do without having recourse to such means.

	GRAVITY.			
	1st Sample.	2d Sample.	3d Sample.	4th Sample.
Pure juice of Red Currants,	45.	53.3	56.1	60.2
Do. White do.	47.2	52.1	55.	57.3
Do. Black do.	46.	50.3	54.	58.
Green Gooseberries, two-thirds ripe,	...	53.5	53.8	53.9
Mulberries,	...	58.6	59.1	60.3
Elderberries, England,	...	56.1	56.5	57.
Do. Scotland,	...	53.2	54.9	55.
Ripe Grapes, " Green Sweetwater,"	...	...	69.2	70.5
Half Ripe, do.	...	39.	45.	45.9
Two-thirds Ripe, " Black Hamburgh,"	...	...	50.	50.1
Foreign Grapes, in jars and barrels,	68.1	68.8	68.9	70.
Do. do. do. Black,	67.8	68.	68.1	68.9
Oranges,	48.	48.7	48.2	49.
Lemons,	37.	37.4	37.4	38.
1 lb. of Valentia Raisins, steeped in one gall. water 21 days,	16.8	17.6	17.8	18.25
1 lb. of Malaga do., imported in Matts of 56 lbs.,	16.6	17.5	17.5	18.1
5 lbs. of Parsnips, boiled in one gallon of water for two hours,	15.	15.2	15.2	15.2

TABLE II.

SPECIFIC GRAVITY OF SUGAR, HONEY, MOLASSES, SUGAR CANDY, MALT.

	PRICE.	GRAVITY.		
Bengals, very fine, price from	56 to 60s.	35.6	35.9	36.8
Do. " Corsesipore," fine	59s.	36.	36.	36.1
Do. " Benares," low	52s.	35.8	35.9	35.9
Do. " Dhobahs,"	56 to 60s.	36.6	36.6	36.9
Java, very fine	....	36.	36.5	36.7
Mauritius,	53 to 56s.	36.	36.5	36.7
Havannah,	49 to 54s.	35.9	36.1	36.9
Grenada,	48 to 52s.	35.9	36.	36.1
Jamaica,	55s.	35.3	35.5	35.50
Crushed,	53s.	...	...	35.
Refined,	68 to 80s.	36.3	36.8	36.9
Sugar Candy,	10¾ per lb.	37.5	37.5	37.6
Honey, Jersey, very thick	45s.	...	...	31.6
Do. Grecian,	66s.	...	...	29.1
Do. Cuba,	60s.	...	...	29.3
Do. Scotch,	....	...	...	30.5
Molasses, Jamaica,	29 to 30s.	...	29.5	29.7
Golden Syrup,	31 to 32s.	...	27.9	29.7
Malt,	82 to 90s.	24.	24.3	25.

WINE MADE FROM UNRIPE GOOSEBERRIES IN IMITATION OF CHAMPAGNE.

Wine made from unripe gooseberries bears so close a resemblance to Champagne, that there is a greater quantity of it produced in this country, than of any other species of home-made wine. As it appears to be more in general use than any other, it is my intention not only to give the reader the result of my own experience in the making of it, but also the experience of others, as well as to lay down the method which the French adopt in conducting fermentation, racking, sulphuring the casks, and other means necessary for producing this peculiar wine. One of the best methods which I have discovered of making this wine, it will be my object particularly to describe. At the commencement I use only one part of water, and three of gooseberries. An imperial gallon of fruit when heaped, weighs about ten pounds, although probably it will be less. To avoid unnecessary calculation, we may as well assume that an English pint of fruit weighs one pound, and that an English pint of water weighs the same. An English pint of water weighs really one pound and a quarter, but this difference is of little consequence, as it is by measure and not by weight that we proportion the fruit and the water.

In the former Editions of this work, and in the examples I gave of the different wines, I fixed upon the size of a fifteen gallon cask, but as a kilderkin, or eighteen gallon, is more readily procured, especially in England, I have, in the present edition, preferred for this, and some of the principal wines, to make my calculations for this size, namely, eighteen. Another reason for my giving the preference to the kilderkin is, that should the maker wish to extend his operations to a barrel or a hogshead, he would find it much more easy to calculate the proportions necessary; for, the kilderkin is the half of a barrel, and the third of a hogshead: and all the casks, kilderkin, barrel and hogshead, may be obtained either old or new, with very little difficulty.

In order that we may realize eighteen gallons of fine, clear wine, at the time of bottling, it will be necessary to make up at first, twenty gallons of juice and water. It is always advisable to make a two gallon cask in addition, for the purpose of supplying the deficiency which will necessarily arise from racking off the larger cask, so that, instead of filtering the grounds from the latter, and returning the filtered wine into it, you will fill it up from the small cask.

This method of employing two casks I would strongly recommend, both for this wine and for every other.

To make up this quantity, eighteen gallons for the kilderkin and two for the small casks, in all twenty gallons, the maker will require thirty gallons of gooseberries about two thirds ripe, and ten gallons of water. The gooseberries most approved of, for Champagne, are the Green Gaskins, but in my opinion any other green gooseberry is equally good, always keeping in mind that they should not be more than about two-thirds ripe. To proceed—prepare three tubs and a fermenting cask; two of the tubs to hold the gooseberries, and a third to bruise them in—the fermenting cask to reserve them when brusied. The water and the berries are not to be mixed up at once; one gallon of the fruit is to be bruised at a time in order that every berry may be broken, which can easily be accomplished in this manner, but which would be almost impracticable were all the thirty gallons attempted to be bruised together. Every gallon of fruit when bruised is to be thrown into the fermenting cask, and one-third of a gallon of water added, and so on until the thirty gallons are bruised; that is, after each gallon of bruised fruit, one-third of a gallon of water is to be put into it, until the the thirty gallons of bruised fruit are emptied into the fermenting cask, and the ten gallons of water added. I may just remark here that a simple and expeditious way to bruise the fruit effectually, is, to procure a small block of hard wood, either of Ash or Plane, of the size of about eight inches by five, and two inches thick. Perforate this block with gimblet holes, and fix firmly in the centre of it the handle of a spade. When the whole mass is in the fermenting cask, it should be well stirred and thoroughly mixed, a portion of the liquor taken out for examination by the sacharometer, and the specific gravity noted in a book kept for the purpose. It is probable that now the gravity will be about three and a half in the glass saccharometer, which multiplied by five, will be seventeen and a half; the fermenting cask is then to be covered up. The next morning the mass is again to be well stirred up, and a second examination gone through and the result recorded. The gravity will not appear to have increased much, but as long as it does increase, the liquor must remain on the bruised fruit, because fermentation will not have yet commenced. The period at which fermentation will commence cannot be assigned, as sometimes it will be at the end of ten hours, and sometimes not until three days shall have elapsed; the saccharometer is the only sure guide in this, and in fact in every stage of the process. As soon as a decrease in gravity is perceived, fermentation has assuredly commenced, and the skins must then be removed. This is to be accomplished by emptying the fermenting cask into the two tubs; the former vessel is now to be washed and the liquor strained through a seive into it, squeezing the skins with the hands, and throwing them into the third tub, at the same time pouring upon them, two to three gallons of water. This liquor in the fermenting cask along with that on the skins, which of course is to be strained and added, should measure at least twenty gallons. It is of consequence, however, to notice, that the fermenting cask should be of such a size as would hold at least thirty gallons. A Port wine quarter cask would be very suitable for this purpose, if it could be entirely deprived of the stain it has received from the red wine it contained. The gravity is now again to be ascertained, for the purpose of proportioning the sugar necessary to raise the *must* to the standard gravity.

Having mentioned in the introduction that one hundred and four to one hundred and ten is a gravity quite sufficient for Champagne, let us fix upon the highest of these, one hundred and ten. We shall suppose that the *must* has now been reduced to three in the glass Saccharometer, which is fifteen of gravity, by the additional water that was put to the skins; and for our standard, one hundred and ten marked on the glass instrument twenty-two, we require an additional gravity of ninty-five, and which must be made up by sugar.

In the former editions I recommended refined sugar to be invariably used in making up the gravity for this wine, in order that the colour should be as pale as possible; but latterly it is evident that the French in some respects altered their method in the management of this wine, for we find that their best Champagne is now quite of a different colour from what it was formerly; therefore, instead of recommending the use of the refined sugar, which, except for preserving the pale colour, is not desirable, I would now recommend the finest Bengal or Corsesipore. Sugar has but a very small portion of fermenting principle in it, and in the refined sugar, this small portion has been completely destroyed, by the process it has undergone; and the want of this principle in the sugar, an ingredient of which, for the production of this wine, the maker requires so much, is a serious loss to him.

By using one pound of the very finest Bengal or Corsesipore sugar almost white, to every gallon of the *must* in the fermenting cask, and mixing all well together, an increase of gravity will be observed to the extent of about thirty-five. By adding a second pound to each gallon and thoroughly mixing as before, a further increase of thirty-five will be shown, making seventy, being still deficient twenty-five, therefore, nearly three quarters of a pound more will be required. To render the calculation plain, one half pound will give the half of thirty-five, namely, seventeen and a half; and a quarter of a pound will of course give the half of seventeen and a half, namely, eight and three quarters, making in all one hundred and eleven and a quarter.

Juice and water,			... ...	15
1st pound of sugar,			...	35
2d	do.	do.	...	35
½	do.	do.	...	17½
¼	do.	do.	...	8¾
				111¼

By this calculation it is assumed, that each pound of sugar to one gallon of *must* will increase the gravity thirty-five; but, however, in most instances where the best Corsesipores are used, which should be always the case, a gravity of 36 will be assuredly obtained: therefore it will depend on which sugar is employed, whether we use two pounds and a half, or two pounds and three quarters. Assuming the sugar imparts only thirty-five of gravity to each gallon, then the twenty gallons of *must* will require about fifty-five pounds of sugar. Instead of using two pounds and three quarters of sugar to each gallon, I would recommend two pounds and a half of sugar, and a quarter of a pound of virgin (Flower) honey to each gallon. The honey must be boiled with the same weight of water for fifteen minutes, and well skimmed during that period. This plan is a little more expensive, and troublesome, but the honey will add to the wine when made, a soft and mellow flavour, which causes it more to resemble the foreign Champagne. The whole being put together and thoroughly agitated and stirred up for the purpose of amalgamating the mass, will now be increased in quantity by the sugar. The introduction of sugar always increases the bulk of the liquor, to the extent of nearly one gallon for every sixteen pounds of sugar employed. Losses however arise from evaporation, and various other causes, during the process of fermentation, in this and every other instance, but these losses are more than fully compensated by what is gained by the introduction of the sugar. In Ginger wine, however, and others, in which boiling is had recourse to, there will be a loss of about twenty-four to thirty per cent. This will be more particularly pointed out when we come to treat of Ginger wine. The fermenting cask is now to be covered by the head being put on, and a blanket thrown over it. The process of rousing or agitating must be repeated during the first day several times; after the last agitation, a portion should be taken out, examined by the saccharometer, and the result noted. It now becomes only necessary to repeat this operation morning and evening, until the gravity has been reduced to ninety; but the wine would be greatly improved were it reduced to eighty. It is then to be strained through a seive, and put into the casks — the kilderkin and the two gallon cask,—which have been previously placed obliquely upon a stand with a dish under each to receive the impurities that from time to time are thrown from them. The remainder of the *must* which may amount to upwards of a gallon, is kept to fill up the casks; and this, for the first day, should be done every three hours. At the expiry of a week the casks are to be slightly bunged down, and a gimblet hole made in each near the bung, where a spile is slightly put in to allow a portion of the gas to escape when found too abundant. The casks being completely full, instead of drawing off a sample for examination, the saccharometer can be put in at the bung-hole and the gravity ascertained. This inspection should take place once or twice a-week.

To ensure perfect success in the manufacture of this wine, we cannot be too careful and strict in repeating the examination of the liquid during the whole process of fermentation. The latter ought to go on with as great regularity as possible; and should it either go on too rapidly or too slowly, means must be adopted to retard or to accelerate it accordingly. If it proceeds too rapidly, racking must be had recourse to, by which means the wine is separated from the lees where the fermenting matter is present in the greatest abundance. If it proceeds too slowly, the point is to agitate the whole contents of the casks, which may easily be done by employing a wooden stirrer. The French effect this by bunging up their casks and rolling them to and fro.

Now I have brought the reader so far, I think it advisable to record here the method employed on the continent by the makers of that class of wine, after it is casked. This I have found in a very scientific work of Dr. Shannan's, Appendix, page 110.—"The French allow their wines to ferment in the casks ten or twelve days, because these wines throw out their ferment so much the more or less slowly, by how much they have more or less warmth, or as the years are more or less hot. After the wine has done fermenting, they stop up the vessels at the great bung-hole, and leave on the side forward an opening about the bigness of a French farthing, by which one may put in his finger. This they call *la broqueleur*, and they stop this up ten or twelve days after, with a wooden peg of about two inches long, for the more readily taking it out and putting it in. All the while the wines are fermenting, the vessels are to be kept almost full, to give them an opportunity of casting out all that is impure. In order for this, they must be filled up for three days within two fingers of the bung: after they have been bunged up, they must be filled every eighth day, at the little hole, for the space of two or three weeks more: and after that once a-day for fifteen days during one month or two; and after that once every two months, as long as the wine remains in the vault, if it be there for years. When the wines have not body enough, or are too green, as it often happens in moist, cold years, and when they have too much liquor, as in hot and dry years, three weeks after the wines have been made, they must be rolled in the casks five or six turns, to mingle them with the lees, and this must be continued every eight days for three or four weeks. This mingling of the lee with the wine being repeated, will strengthen it, soften it, ripen it, and render it more forward, and make it fit to drink in as short a time as if it had been transported from one place to another. These wines must be let stand in the cellar till towards the 10th of April, when they carry them down into the vault; but as soon as it begins to be cold, they are to be carried up again into the cellar. It is of consequence to be observed, upon this subject, that the wines ought always to be in cool places, and never to suffer the heat. And as the vaults are cool in the summer, and warm in the winter, as soon as it begins to be hot the wines must be carried down, whether they be in pieces or in bottles, into the vaults, and when it begins to be cold they must be carried up into the cellar."

Racking.

"There has been nothing better invented, and more useful, than the manner of drawing off wines. Certain experience convinces that it is the lee that spoils wines; and that they are never better, nor more lively than when they have been well drawn off, whether you would bottle it or keep in the pieces; it ought always to be drawn off out of one vessel into another, at least twice into another vessel, well washed, leaving the lee in the former."

Fining.

"You should draw off the wines, the first time towards the middle of December; the second time towards the middle of February; and to fine them in March or April, eight days or thereabouts before you bottle it. For every piece of wine you must have of isinglass, that is the whitest, of the weight of a crown of gold, weighing two deniers fifteen grains, or sixty-three grains.* They take so many times the weight of a crown of gold, as they have pieces of wine to draw off; they put this quantity of isinglass in one or two pints of the same wine in a bucket for a day or two, to give it time to dissolve: others put it in a glass or a pint of water, according to the quantity, in order to hasten its dissolving, which is always difficult to be done: some mix it in a chopin or pint of wine, or excellent aqua vitæ.

"When the islinglass is grown soft, they handle it well, to divide it and distribute it; then, when the parts begin to separate, they put into the bucket, or vessel, in which this dissolution is made, so many pints of wine as they have casks, or pieces to draw off. Then they handle the isinglass well again, and pass it through a strainer, the holes of which should be very fine: they often pour in some of the same wine to dilute it well; and when there remains nothing in the strainer, they pass all the liquor over again

* Our wine merchants use an ounce of islinglass for a pipe of wine, and dissolve it in sour wine; the sourer the sooner it dissolves.

through a linen cloth, and squeeze it well; and afterwards they put one good pint, or less, into each cask, and half in each carteau. They stir the wine in the piece with a stick about the middle, without suffering the stick to go any lower. It is sufficient to stir the wine for the space of three or four minutes. A certain private person has contrived a quicker method of dissolving this isinglass. After it has steeped one day in water, he melts it in a skillet upon the fire, and reduces it to a ball, like a bit of paste, and afterwards puts it into the wine, when it distributes itself with less difficulty.

"After what manner soever it be dissolved, care ought to be taken not to put in too much liquor, and not to put more than a proportionable quantity of water or wine to that of the isinglass. The isinglass works its effect ordinarily in two or three days; though sometimes it does not clarify the wine in six or eight; but nevertheless you must wait till the wine is clear before you change the vessel. In the winter, the seasons are oftentimes so improper for this, that there is a necessity of putting isinglass a second time into the piece, but then you must not put in more than the quantity before mentioned. But when it freezes, or the weather is clear or cold, the wine will clarify itself perfectly well, and in fewer days: it has a colour more lively and brilliant than when it is fined and drawn off in faint, moist weather. As soon as the wines are clear, they are to be drawn off, and the vessels changed. Four or five new casks are sufficient to draw off two or three hundred pieces of wine; for when they have emptied one piece, they take out the lee and put it into the old casks, wash it, and it serves to draw off another into it. They put together into separate casks all the remainders of the empty pieces: presently after they have emptied one, which they do in half an hour, they wash it with a bucket of water, let it stand to drain some moments, and then fill it with another that is to be drawn off. After the wine has been emptied out of one vessel into another the first time, they draw it off a second time, at the time we have before mentioned. Sometimes they are obliged to do it a third time, to give it a lively colour, if it has it not already; but four days before they change the cask, they give it a *frizure*, as they call it, and put in it one-third part of ordinary isinglass.

"The most experienced persons shift their fine wine out of one vessel into another, as often as they change its place, as well when they carry it down into the vault, as up into the cellar, according to the different seasons. I have known when in four years' time they have drawn it off twelve or thirteen times, and they pretend that this is that which preserves and sustains the wine, and that it has been the finer and the more delicate. Their opinion is, that the wine is continually forming a fine lee, which gives it the colour; and that to preserve it of a good white, it must be often shifted out of one vessel into another, if it be not put into bottles; and that there is no reason to fear that the wine will be weakened by this means, because the oftener it is removed, the oftener you give it a new vigour; and the oftener it is drawn off, the more lively and brilliant is the colour."

Matching.

"And although I have said they should not brimstone their casks, they do not fail to use a match of brimstone the first time they change their vessels: they mingle a piece of thick linen cloth in the melted brimstone, and then cut off a bit for each cask of fine wine, about the size of one's little finger, and one as large again for every piece of common wine: they light it, and put it under the bung of every piece they empty, before that they have recourse to the bellows: according as the wine descends, it draws along with it a small scent of brimstone, which is not very strong, so as to make it perceivable, and that only leaves what will give a liveliness of colour: the same may be done the second time, when they change the cask, if it has not taken the scent the first time, otherwise it ought to be drawn off the second time without a match, to cause it to lose the scent of the brimstone, which it ought never to have. The wines that are thus clear and fine keep well in the cask two or three years, and hold their goodness in the vaults and cellars, but especially the Mountain wines that have a good body: those of the River lose their quality in the wood, and they ought to be drunk in the first and second year, or else they must be put into bottles. This wine will keep very well for five or six years in bottles."

Bottling.

"When they have a mind to draw off a piece of wine into bottles, they put a little syphon of metal into the cask, which is bent downwards to strain it into the bottle, under which there is a tub or bucket, to catch the wine which shall run over. They stop up every bottle carefully with a good well-chosen cork that is not worm-eaten, but that is solid and close. These sorts of fine corks cost fifty or sixty sols a hundred. There cannot be too much care taken in the choosing corks, lest the wine spoil in some of the bottles, when the corks are defective; therefore, great care should be taken in the choosing them, when you would draw off fine wines into bottles, whether it be for keeping or to be sent abroad. When bottles are used that have been made use of before, they should be washed with leaden shot and a little water, to fetch off the filth that shall remain on the bottom of the bottles; but it is much better in the room of them to use small nails, because they perfectly take off all that which sticks to the glass. When all the bottles that suffice to empty one cask are filled, they tie the mouth of the bottle over to the neck with a strong pack-thread; and if it be a fine wine, they commonly seal it with Spanish wax, that the wine may not be changed, nor the bottles, by the domestics; and some persons have their coats of arms made on the bottles, which does not enhance the price above thirty sols per. cent. When all the bottles are well stopped, tied down, and sealed, they ought to be set either in a vault or cellar upon sand, two or three fingers deep, and laid sideways, leaning against one another; when they are set upright, they form a white flower upon the wine at the top, in the small empty space that is between the top of the mouth of the bottle and the wine; for the bottles ought never to be filled up to the top, but there must be left a small empty space, of about half an inch, between the wine and the end of the cork. If this was not done, the wine would set a-working in the different seasons of the year, and break a great number of the bottles; and it does, notwithstanding, break a great many in spite of all the caution that can be taken; and more especially when the wine has a great deal of heat, or is a little tart. In some years the wine grows ropy in the bottles, even in the vaults, so as to rope when it is poured out, as if it had oil, so that it cannot be drunk. This is a malady that seizes the wine that has stood several months without being removed from one place to another: if it be set in the air it will remove more of its ropiness than it will if left in the vaults; it will recover itself in eight days if set in a very airy granary, better than it will oftentimes do in six months in a vault. When one is obliged to drink ropy wine, if he shake the bottom strongly for the space of half or quarter of an hour, and then uncork it immediately after he has done shaking it, the bottle, being inclined a little on the side, will cast out presently half a glass of froth or scum, and the rest of the wine will be drinkable, whereas otherwise it would not be so."

Mantling.

"For about twenty years last past, the gust of the French has been determined for a frothy wine; and this they used to love, as one may say, even to distraction. They have begun a little to come off from that for the last three years.

Their sentiments are much divided as to the opinion of this kind of wine; some believe that it proceeds from the force of the drugs that they put in it, which makes it froth so strongly; others attribute it to the tartness of the wines, because the greatest part that do froth are extremely tart; others attribute this effect to the moon, according to the times in which these wines are bottled. It is true, there are a great many wine merchants, who, seeing the great fondness that there is for their frothy wines, oftentimes put alum and spirit of wine to make it froth extremely; but it is certain, by experience, that the wine froths when it is any time bottled from the vintage to the month of May. There are some who pretend, that the nearer the vintage time the wine is produced, when it is bottled, the more it froths.

"Many do not agree in this opinion, but nothing is more certain, than that there is no time in which the wine froths more than about the end of the second quarter of the month of March, and this always happens towards the holy week. There does not need any artifice at all: one may always be sure to have wine perfectly frothy, when it is bottled from the 10th to the 15th of the month of March. Of this there is such reiterated experience, that it cannot be doubted. It is good to know that the wine does not froth presently after it has been put into bottles; it must be at least six weeks, and sometimes six months, before it froths well. If it is to be transported, you must give it near a month of the vault, especially in summer, to recover its remove. But as wines (especially the Mountain wines) are not ordinarily bottled in the holy week, because they are too green, or have too much hardness, especially if the year has been cold and moist, or too much liquor expressed, if the year has been hot; the most sure and advantageous way to have exquisite wine, that is, perfectly frothy, is not to bottle it till the rise of the sap of August. It is certain, by experience, that it froths excessively when it is bottled from the 10th to the 14th of August; and as it will then have lost the tartness or greenness of its liquor, one may be assured in bottles to have the ripest and most frothy wines. There has been another experiment tried, which is, not to bottle the Mountain wine till the holy week of the second year, that is, eighteen months after the vintage; and it has been found that it froths sufficiently, but less by half, than that which has been bottled in the rising of the sap of March the year before. It is not believed that the River wine, which has a less body than that of the Mountain, can froth so much in the second year. When one would have wine that will not froth at all, it should be bottled in October or November, the year after the vintage: if it be bottled in June or July, it will froth slightly, though but little, if any thing at all.

" As these wines, especially those of the same year, work continually in the vaults and cellars, and still more in bottles than in the piece, according to the different seasons, and the divers impressions of the air, it ought not to be surprising if the same wine, especially the new, oftentimes appears different in taste. We find a wine potable in January and February, which will seem hard in March and April, because of the rising of the sap, which agitates it more; the same wine in June and July will appear entirely soft, and in August and September hard again, which one shall not be able to perceive any thing of during the preceding months, because the rising of the sap in August will put the parts in a great motion. Motion will have this effect on the River wines of the year; but oftentimes the wines of two years from the mountains will appear more mellow, more or less exquisite, more or less forward, according to the different motions it has received by the different impressions of the air, which will vary more sensibly in the different seasons of the year. There ought to be very great attention to keep the wine continually in cool places; nothing does it more hurt than heat: it is therefore of the greatest importance to have good cellars and excellent vaults. No part of the world has so good vaults as those in Champagne, which is the reason it is so difficult to find any where else such good wines as those of this province. Those who would lay up a stock of wine, and are able to keep it two or three years, or whose business it is to send it into other far distant provinces, or to foreign countries, ought to choose the Mountain wine; for as it has more body, it will better bear transportation than those of the River; and, besides, the English, the Flemings, the Dutch, the Danes and the Swedes, desire these strong wines, that can bear the transportation, and hold good for two or three years, which the River wines will not do——."

I now give Dr. Macculloch's observations on gooseberry wine, page 186.—"The gooseberry is one of the fruits most commonly used, and is, in particular, well known as an ingredient in brisk wines, which are made to resemble, in appearance at least, the wines of Champagne. For this purpose it is used in an unripe state. It is well known in the wine countries, that, independently of those causes of briskness in wines, which consists in the management formerly described, this property always results from the use of unripe fruits, and is readily produced by mixing unripe grapes with ripe ones. The case is the same with the gooseberry. The fault of this wine, however, if it be considered as an imitation of Champagne, is a bad flavour, which is almost invariably communicated by the fruit, and that in proportion to its ripeness. To avoid this evil, so generally injurious to the brisk gooseberry wines, the fruit can scarcely be taken in a state too crude, as at this period the flavouring substance has not been developed. At the same time, the expressed juice should be alone used, care being taken to exclude the skins from the fermentation, as being the part in which the flavour principally resides. With these precautions, the noxious flavour may generally be prevented. It is true, that the produce is then without flavour, or nearly so, but this is by much the most tolerable fault in domestic wines, whose leading defect is almost invariably a disagreeable taste. Various proportions of fruit and sugar are used by different persons ; but the most common consists of three pounds of sugar and four of fruit to eight pounds of water. Here the proportion of fruit is too small compared to that of the sugar, and the fermentation is consequently, in general, so imperfect as to leave the wine disagreeably sweet. At the same time, the proportion of sugar is such as to render the wine stronger than the strongest wines of Champagne.

" If, therefore, this wine is to be amended in composition, it is either by reducing the sugar, if we are contented with a weaker wine, or by increasing the fruit, if we are desirous of retaining the greater strength. In managing the fermentation to a constant and successful result, the rules laid down, as practised for Champagne wine, are strictly applicable in the present case; and with these precautions and practices carefully attended to, the produce of the gooseberry will be invariably successful. I may also add, that it is perfectly durable; as much so as Champagne wines of corresponding quality, provided equal care be taken in the bottling, the cellarage, and other management—all of them circumstances in which our domestic fabricators are too apt to fail, thinking, that when they have mixed together a portion of sugar and fruit, their labour is finished, and the rest may be trusted to chance. They should consider, on the contrary, that it has but then commenced."

Page 157.—" Thus, if we are desirous of making a wine to imitate Champagne, it is necessary to watch for the period when the fermentation is re-excited by the arrival of spring.

" By bottling in this stage, we insure a brisk wine, which, if bottled, either in the cold of winter, or after the second fermentation has been exhausted by the heats of summer, would be dead or still. This renewal of fermentation, or fretting, as it is sometimes called, is also a favourable time for the addition of flavouring matters, as they then give out their flavours, and combine with the wine. It is at this time also that spirits should be added to the wine, if it is ever allowable to make this addition. It is the only time at which alcohol can safely be added without destroying its vinosity, as it then enters into a kind of chymical combination with the wine. It is necessary, likewise, to consider the effects which the air produces in fermentation, although its presence may rather be considered as favourable than essential. If the liquor is shut up in close vessels, it does not readily ferment, although it still slowly undergoes this process, and is at length converted into perfect wine. It is ascertained that no air is absorbed during the vinous fermentation, although this happens in the acetous, but that the free and ready disengagement of the carbonic acid is the principal circumstance in which fermentation in open vessels differs from that in close ones. One important fact, however, is established, that the wine is stronger when the fermentation has been either partially or totally carried on in close vessels, and that the flavour is also better preserved; and it appears that a great part of the alcohol produced is dissipated by the carbonic acid, which holds it in solution, and which produces a well-known effect, both on the organ of smell, and on the nervous system in general, when this disengagement is made in the stomach. It is not yet well explained how the carbonic acid is disposed of when produced in close vessels. Many of the practices followed in making particular wines depend on a consideration of these two modes of conducting the fermentation; but it rarely happens that an exclusive fermentation in close vessels is used. This is generally reserved for the last and most tranquil stage. A consideration of the effects produced by these different methods, and of the product which we wish to obtain, will be necessary to guide us in our choice of either of these two processes, or of a certain admixture of both. If the wine is meant to be still, and if it is not desirable to husband the strength and flavour, the whole fermentation may be carried on openly. This will be the case with strong and sweet wines. If, on the contrary, a wine of the character of Champagne is intended, which must retain its briskness, flavour, and strength, we must be guided in our practices by rules similar to those in use in that and other districts of France, and adopt a partially close mode of fermenting. In all cases it appears to be a useful practice, even if the first fermentation is carried on in an open vat, to exclude the free access of air, by covering the vessel with boards and blankets. If the first fermentation is carried on in the vessel in which the liquor is meant to continue (a case which only can occur when no solid matter is fermented with the fluid), a slight covering will be sufficient. Whatever process has been adopted in the first instance, the bung may, after a time, be slightly put down, and ultimately tightened, a spile-hole being added to give an opportunity of relieving the vessel from time to time of the elastic fluid which might endanger its safety." Dr Macculloch likewise states, page 162, "That the carbonic acid is not necessarily separated and disengaged from the wine, since the brisk wines of Champagne owe their sparkling quality to a portion of it which is retained by them, either in consequence of the period of bottling being duly chosen, or to a portion of leaven allowed to remain in the bottled wine, and which has a tendency to renew the fermentation under confinement. This quality is sought after in many wines, and it is often, in the worst class of Champagne wines, the only valuable one which they possess. It is owing to the necessity of having a superfluous quantity of leaven for producing this effect that a brisk wine is with difficulty made, unless a portion of unripe fruit enter into the composition. This is the case with the wines of Champagne, and equally so with the produce of our gooseberry, which has been conceived to resemble them."

I left the reader with his *must* in the cask. I have recorded the mode which the French adopt when their *must* for Champagne has been brought to the same state. I have also given Dr. Macculloch's observations on several essential points; and I would again advise the operator to follow, as nearly as possible, those rules which the French lay down, as they are generally applicable to *must* made from the unripe gooseberry. In this stage of manufacture, there is one exception, however, which is, that if the wine so made is intended to be effervescent, it ought to be bottled off before the April following, otherwise it will, in nine cases out of ten, prove silent.* Wines in France are made solely from the juice of the grape; and as that fruit has every requisite for producing a perfect wine without artificial aid, it therefore requires more attention to be paid to it, after it is casked, than wine made in this country.

Indeed, it is almost impossible for wine made according to the principles which we have attempted to elucidate, to run from the vinous into the acetous fermentation, because the quantity of saccharine matter very greatly exceeds the natural leaven of the fruit. This arises from the

* In connexion with spirituous liquors, the word *silent* frequently occurs as descriptive of some characteristic. With regard to whisky, it signifies that the spirit is devoid of any particular flavour, and with regard to wines, the technicality *silent* or *still*, denotes that they are devoid of any effervescing quality.

pure juice in which it is contained being so much impoverished by the large quantity of water used. I have never examined with the saccharometer the juice of the grape of France when ripe for the press, but M. le Comte Chaptal, a celebrated French writer, asserts that the specific gravity of the juice or *must* from the grape, is between 1058 and 1100, or, in the language which I employ, 58 and 100; so by making our *must* to 110 (my standard for this wine,) it is absolutely abundant. Were we to use three and a half pounds of sugar, as prescribed by the generality of receipts, instead of two and a half, we would bring up the *must* of 110 to 146, which would be 46 higher in gravity than that of the French, and it would be so syrupy that no care or skill could possibly reduce it to a desirable attenuation, without artificial means being employed for this purpose.

I have one receipt given me for imitating Madeira wine. The quantity of saccharine matter recommended to be employed is enormous, and would bring up the gravity to 218 or 220, that is 100 more than my standard. How any one contrived to reduce this sugary extract to any thing like a consistent attenuation, I am at a loss to conjecture.

I once made a wine, in imitation of Madeira, at a gravity of 140, and found it quite impracticable to reduce it below 36. But a gravity of 220 could not possibly be reduced to 80 in the small quantity specified. Hence, instead of wine, it would be for twenty years a perfect syrup; and, without a very large portion of spirits were added, it would be in a continual ferment.

A grand point would be gained if we could correctly ascertain what quantity of the juice of the gooseberry would attenuate one pound of good sugar to *zero*; that is to say, how much pure juice will be requisite to be put into one gallon of water, sweetened with one pound of sugar, and in what state of ripeness the berry will give the greatest quantity of natural leaven, and the least of malic acid. If this were found out, we should then have data by which to regulate this part of the process with the greatest nicety. As the gooseberry does not impart to the wine any flavour, except a bad one, it is advisable not to put more juice than absolute necessity requires to reduce the *must* to a proper degree. Gooseberry wine (Champagne) does not need so much care in this respect as other wines do, such as Currant, Strawberry, Mead, &c., because it does not require to be reduced to such an extent as they do. It will now be my endeavour to convey to the mind of the reader to what degree the *must* should be reduced, and how this reduction is to be accomplished. It was 90 when put into the cask. All possible means should now be used to excite fermentation. I reduce the gravity two-thirds, and my standard gravity, as noticed before, being 110 for gooseberry wine, this reduction will bring it to about 36. When it has decreased to this degree, I endeavour to check fermentation by racking, after having previously fined the wine with isinglass. Having reduced the gravity, I treat it in a way similar to that recommended by Dr. Macculloch. It is a very great improvement to sulphur the cask slightly. I wash the cask inside with British Brandy, and as every part of the interior requires to be wetted with the spirits, an eighteen gallon cask will require two bottles. The brandy, after wetting the cask, is allowed to remain. I return the clear wine into the cask, and as there is a deficiency, occasioned by keeping back the lees, I make it up from the clear wine drawn from the small cask. Should this, however, not be sufficient to fill the cask, I add a bottle of pale British Brandy. I then put the lees taken from the large cask into the small one, bung both up, and allow the spiles to be slightly pressed in for one day or more, as I find necessary, and then put them firmly in.

This process of the first fining and racking I generally perform in the month of September, the same year in which the wine is made. Towards the end of November, if the weather is dry, I repeat the racking as before (fining the wine and sulphuring the cask excepted,) and make up the deficiency by the loss of lees from the little cask, as on the former occasion. If the wine is not very fine on the second racking, I add half a pint of finings (the method of making which I shall afterwards show,) and bung both casks down, previously having examined it with the saccharometer, when most probably the gravity will be found reduced to 40. I have never found this kind of wine reduced lower in gravity than 25; and at this reduced gravity, I have noticed that it was not sufficiently effervescent to resemble the wine which it was intended to imitate; but at 35 it almost invariably bore this characteristic, when made with the proportions of sugar and honey already described, while the coarse flavour imparted to it by the husks was much lessened. In fact, of this peculiar flavour the honey almost entirely deprives it. Gooseberry wine requires little or no spirits. If any is used, it must be at the first racking, in the manner already described. None must be used in the second. A twenty-fifth part is more than sufficient. I have found little or no difference in the wine, in consequence of bottling it before the spring following, but much difference if it is not bottled before the month of May. It is almost as sure to effervesce if bottled before the spring, as not to effervesce if not bottled during the summer; for this reason, that if the bottling of the wine is delayed until summer, the heat of the weather having excited a fresh act of fermentation, the effervescent quality is impaired, and the wine consequently becomes silent. I lose no time after the second racking in November, if it has been attenuated to about 40, and if it is beautifully clear, to bottle it. When bottled and well corked, strung and wired, I put it into the cellar, laying the bottles horizontally, for the purpose of swelling the corks. About the month of April I change the position of the bottles, and place them upright. The bottles must be laid flat again the beginning of winter, and again placed upright the following April. By following these methods, I doubt not the reader will be encouraged to make a second quantity of this wine on a larger scale, assured that he will be amply compensated for his labour. I have some Champagne in my cellar, of my own manufacture, ten years old, not deprived of its effervescency. I am convinced it will remain as good as it is at present for the next fourteen years. Most probably it will improve with age, until the whole of the saccharine matter is decomposed. A portion of this wine was examined by the instrument a few weeks ago; its gravity was 18.

I have now laid before the reader my mode of procedure before casking, and during casking; and also the French method of managing their wine of this name in the different stages of fermentation, racking, and bottling.

As Gooseberry, Champagne, Grape, and Raisin wines, are those which can be made nearly perfect, so much so indeed, that when properly attended to they pass for a foreign manufacture, I therefore intend to give not only my own mode of procedure in the making of those wines, but the methods adopted by others, where these do not materially differ from mine, recommending the saccharometer, and pointing out the necessity of its use, as the only compass by which to steer with safety. The following is Dr. Macculloch's receipt for Gooseberry Champagne.

DR. MACCULLOCH'S MODE OF MAKING CHAMPAGNE FROM UNRIPE GOOSEBERRIES.

"The fruit must be selected before it has shown the least tendency to ripen, but about the time when it nearly attains its full growth. The particular variety of gooseberry is perhaps indifferent, but it will be advisable to avoid the use of those which, in their ripe state, have the highest flavour. The *green Bath* is perhaps amongst the best. The smallest should be separated by a sieve properly adapted to this purpose, and any unsound or bruised fruit rejected, while the remains of the blossom and the fruit stalk should be removed by friction or other means. Forty pounds of such fruit are then to be introduced into a tub carefully cleaned, and of the capacity of fifteen or twenty gallons, in which it is to be bruised in successive quantities, by a pressure sufficient to burst the berries without breaking the seeds, or materially compressing the skins. Four gallons of water are then poured into the vessel, and the contents are to be carefully stirred and squeezed in the hand, until the whole of the juice and pulp are separated from the solid matters. The materials are then to remain at rest from six to twenty-four hours, when they are to be strained through a coarse bag, by as much force as can be conveniently applied to them. One gallon of fresh water may afterwards be passed through the *mare*, for the purpose of removing any soluble matter which may have remained behind. Thirty pounds of white sugar are now to be dissolved in the juice procured, and the total bulk of the fluid made up with water to the amount of ten gallons and a half. The liquor thus obtained is the artificial *must*, which is equivalent to the juice of the grape. It is now to be introduced into a tub of sufficient capacity, over which a blanket, covered with a board, is to be thrown, the vessel being placed in a temperature varying from 55° to 60°. Here it may remain for twenty-four hours or two days, according to the symptoms of fermentation which it may show; and from this tub it is to be drawn off into the cask in which it is to ferment.

"When in the cask, it must be filled nearly to the bung-hole, that the scum which arises may be thrown out. As the fermentation proceeds, and the bulk of the liquor in the cask diminishes, the superfluous portion of *must*, which was made for the express purpose, must be poured in, so as to keep the liquor still near the bung-hole. When the fermentation becomes a little more languid, as may be known by the diminution of the hissing noise, the bung is to be driven in, and a hole bored by its side, into which a wooden peg is to be fitted. After a few days the peg is to be loosened, that if any material quantity of air has been generated it may vent. The same trial must be made after successive intervals; and when there appears no longer any danger of excessive expansion, the spile may be permanently tightened. The wine thus made must remain during the winter in a cool cellar, as it is no longer necessary to provoke the fermenting process. If the operator is not inclined to bestow any further labour or expense on it, it may be examined on some clear and cold day, towards the end of February or the beginning of March, when if fine, as it will sometimes be, it may be bottled without further precaution. To ensure its fineness, however, it is a better practice to decant it towards the end of December into a fresh cask, so as to clear it from its first lees. At this time also, the operator will be able to determine whether it is not too sweet for his views. In this case, instead of decanting it, he will stir up the lees, so as to renew the fermenting process, taking care also to increase the temperature at the same time. At whatever time the wine has been decanted, it is to be fined in the usual way with isinglass. Sometimes it is found expedient to decant it a second time into a fresh cask, and again to repeat the operation of fining. All these removals should be made in clear, dry, and, if possible, cold weather. In any case it must be bottled during the month of March. The wine thus produced will generally be brisk, and similar in its qualities (flavour excepted) to the wines of Champagne, with the strength of the best Sillery.

"Inattention, or circumstances which cannot always be controlled, will sometimes cause it to be sweet and still, and sometimes dry. In the former case, it may be re-manufactured the following season, by adding to it that proportion of juice from fresh fruit which the operator's judgment may dictate, and renewing the fermentation and subsequent treatment as before. In the latter case, as its briskness can never be restored, it must be treated as a dry wine, by decanting it into a sulphured cask, when it must be fined and bottled in the usual manner. Such dry wines are occasionally disagreeable to the taste in the first or second year, but are much improved by keeping.

"If the whole *marc* be allowed to remain in the juice during the first fermentation, the process will be more rapid, the wine stronger and less sweet; but it will acquire more flavour. If the wine is intended to be very sweet as well as brisk, the quantity of sugar may be increased to 40 lbs.; if less sweet and less strong, the sugar may be reduced to 25 lbs.; it will then be brisk, but less durable, and ought to be consumed within a year. When the quantity of sugar is 30 lbs., it will be perhaps better to use 50 lbs. of fruit than 40, as generally recommended. Wine may be made by nearly the same process from unripe currants and unripe grapes. In this process it may be observed, that no brandy is added to the wine after it is finished, although it is the invariable practice amongst makers of domestic wines to add it." Dr. Macculloch says, "that this practice has been introduced under the mistaken notion of preventing wines from turning sour, and enabling them to keep a longer time;" but he says, " that this admixture decomposes wine, and that, although slow, the process is certain. The first and most conspicuous effect is, the loss of that indefinable lively or brisk flavour, which all those who possess accuracy of taste can discover in French wines, or in natural wines. Brandy is not added to wines in France or Germany: the finer wines, Claret, Burgundy, and Hock, are totally destroyed by it. But the practice is universal in the wines of Spain, Portugal, and Sicily, which are intended for the English market. They are at first rough and strong, but, kept long enough in the cask, they at length ameliorate; their elements combine intimately, and their aroma is developed.

" If, however, brandy, or, what is more general, common malt spirit is to be employed, the quantity of sugar is to be diminished at the rate of two lbs. for every quart of spirit to be added."

WINE MADE FROM RIPE GOOSEBERRIES.

"This wine may be made according to the same formula as of unripe gooseberries. Although the fruit should have been red, the wine will not be so; its tints will be flesh colour; for the red colouring matter is precipitated during the process. The following will not afford quite so good a wine from unripe gooseberries; at least it will require a far longer time to ameliorate to the same degree of goodness. Ten gallons of gooseberries are to be bruised in a tub, and left so for twenty-four hours. The pulp thus prepared is to be introduced, either at once or in successive portions, into a hair cloth or canvass bag, and submitted to pressure. The matter remaining in the bag is to be returned into the tub, and five gallons of tolerably hot water are to be poured on; the whole is to be well mixed up. After thus remaining in the tub well covered for about twelve hours, the matter is to be pressed through the bag, and the liquor obtained is to be mixed with the original juice. The solid matter of the fruit is then worth very little, and may be thrown away. In every five gallons of the liquor, consisting of the mixture of original juice with the infusion, twelve pounds of white sugar are to be dissolved perfectly. If the liquor be now left to itself, it will, after some hours, show symptoms of a commencing fermentation. In proportion as the fruit is ripe, the temperature of the weather ought to be high. Should it be very cool weather, the liquor should be placed near the fire. If the gooseberries were unripe, or just ripening, the fermentation will take place at a lower temperature, and with more activity. The progress of the fermentation should be frequently ascertained by tasting the liquid, it becoming continually less sweet, until at length the sweetness totally disappears: at this period the fermentation is complete. When the fruit has been over-ripe, or when the weather is remarkably cool, the last portions of sugar remain a long time unaltered, and the fermentation is suspended. Placing the containing vessel near the fire will always renew the fermentation; so long as this degree of heat is kept up, the fermentation will proceed. When the quantity of wine under fermentation is very considerable, it will generally keep its own temperature.

"Should the season be so warm, and the fermentation so rapid, as to excite fears of souring, which, however, can never happen while the quantity is so small as ten or twenty gallons in each fermenting tub, we can readily avert the danger by racking off from the lees, having first skimmed off the head of the yeast. When the fermentation has totally ceased, the wine is to be racked off, as clear as it can be procured. To every five gallons of it, two quarts of brandy, or good old malt spirit are to be added, well mixed up, and left to settle; for the spirit causes a separation of flocks which previously had been in solution. After subsidence for perhaps a month, the clear liquor is to be cautiously drawn off; introduced into a cask which it just fills; and set by in a cool cellar for a great length of time. It is seldom that the impatience and curiosity of inexperienced makers of domestic wines for family use, can brook the delay of keeping the wine long enough to mellow sufficiently. The wine just described will require five years at least to be in its best condition, and must have been kept in wood all that time.

"It may then be bottled. A much shorter time will, however, render it tolerable."

RIPE GRAPE WINE.

Grape wine, of course, stands first, in regard to quality and character, of all domestic wines; and if a complete fermentation has been regularly conducted, from a correct standard of specific gravity, a wine not inferior to foreign will be obtained, especially when the grape is not spared, and the season is propitious. For making this wine in a plentiful year, fifteen pounds of grapes to each gallon of water are used, but twenty would be preferable. The grapes, after being picked from the stalk, are slightly broken with the hand. When carefully pressed, the water which we mean to use is well mixed in with the fruit so bruised, a sample is taken to be examined by the saccharometer, the gravity noted, and the tub covered. The next morning they are again well agitated and mixed, and a second sample taken, weighed, and noted, when an increase of gravity will be shown. These operations are performed morning and evening, until it is found that the gravity is less than at the last examination. This decrease assures us that the extraction has been completed; and nothing now remains but to draw off this liquor from the husks, which is accordingly done, as they can no longer communicate any thing desirable or advantageous to the wine. The fruit being pressed and the liquor drawn off, the husks are then washed with as much water as is found necessary to deprive them of any good which may yet remain in them. This liquor is then strained from them and added to the former. The whole quantity is now measured, and a portion of it weighed by the saccharometer, in order to direct the operator in proportioning the sugar. In consequence of the coldness of this climate, even grapes, ripe grapes, are deficient in sugar, and necessarily require a portion of this article itself to supply the want. The higher the gravity of the juice and water is before putting in the sugar, the less sugar will it require for a complete fermentation.

After the gravity of the juice and water is found, the proportion of sugar necessary to bring the *must* up to the standard gravity of 120 will easily be ascertained. This fruit, in a dry warm year, when perfectly ripe, and the vine grown in a favourable situation, will produce, in the pure juice, a gravity of 75. By adding the same portion of water as pure juice, the gravity of 75 will be reduced to 38. By using two-thirds of pure juice and one of water, the original gravity of 75 will be reduced to 50 instead of 38, leaving then a deficiency of 70, which must be made up by sugar. As one lb. of sugar dissolved in a gallon of water is equal to 36, therefore, to supply the deficiency of 70, two lbs. of sugar to each gallon of juice and water will be required; and this will raise the gravity from 50 to 122.

The fermentation of this wine is conducted in the same manner as that of the former.

When this wine is intended to be a dry* wine, it is reduced at its lowest gravity, to 15 or 20. When intended to be a sweet wine, to 35 or 40.

Care should be taken to examine and note the gravity at least once a-week, until the cask is bunged up. Racking is necessary in this wine, as well as in all others; but it should not be per-

* When the adjective *dry* is applied to wine, it denotes that the liquor is divested of any perceptible sweetness. For instance, Mountain, or even Lisbon, from their sweetness, form a contrast to Sherry, which is a dry wine.

formed until fermentation has in a great measure subsided, unless it should be too violent, when the racking is necessary to give it an effectual check. The cask must be slightly sulphured, as already noticed in the case of the former wine, and the deficiency from loss of lees, made up from the fine of the small cask, as before recommended.

If the wine has been reduced to 15, one lb. of sugar-candy is put into the cask, which is then bunged up, and allowed to stand for fifteen months before being bottled. Two years in the wood, instead of fifteen months, greatly improve grape wine. In this case, however, it is necesary to examine the wine every six months, and make up any deficiency of quantity by adding spirit, and a small portion of water and sugar.

THE HONOURABLE CHARLES HAMILTON'S MODE OF MAKING RIPE GRAPE WINE.

The following is the account given by the Hon. Charles Hamilton of his success in making wine from grapes in this country :—"The first year, I attempted to make red wine in the usual way, by treading the grapes; then letting them ferment in a vat, till all the husks and impurities formed a thick crust on the top: the boiling ceased, and the clear wine was drawn from the bottom.

"This essay did not answer: the wine was so very harsh and austere, that I despaired of ever making red wine fit to drink; but, through the harshness, I perceived a flavour something like that of some small French white wines, which made me hope I should succeed better with white wines. That experiment succeeded far beyond my most sanguine expectations; for, the first year I made white wine, it nearly resembled the flavour of Champagne; and in two or three years more, as the vines grew stronger, to my great amazement my wine had a finer flavour than the best Champagne I ever tasted; the first running was as clear as spirits; the second running was *œil de perdrix;* and both of them sparkled and creamed in the glass like Champagne. It would be endless to mention how many good judges of wine were deceived by my wine, and thought it superior to the best Champagne they ever drank; even the Duke de Mire Poix preferred it to any other wine; but such is the prejudice of most people to any thing of English growth, I generally found it prudent not to declare where it grew, till after they had passed their verdict upon it. The surest proof which I can give of its excellence is, that I sold it to wine-merchants for fifty guineas a hogshead; and one wine-merchant to whom I sold L.500 worth at one time, assured me that he sold some of the best of it at 7s. 6d. to 10s. 6d. per bottle.

"After many years' experience, the best method I found of making and managing it was this: I let the grapes hang till they had got all the maturity which the season would give them; then they were carefully cut off with a pair of scissors; and brought home to the wine-barn in small quantities, to prevent their heating or pressing upon one another; then they were all picked off the stalks; and all the mouldy or green ones were discarded, before they were put in the press, where they were all pressed in a few hours after they were gathered. Much would run from them before the press squeezed them, from their own weight upon one another. This running was as clear as water, and sweet as syrup; and all this of the first pressing, and part of the second, continued white; the other pressings grew reddish, and were not mixed with the best. As fast as the wine ran from the press into a large receiver, it was put into the hogsheads, and closely bunged up. In a few hours one could hear the fermentation begin; which would soon burst the casks, if not guarded against by hooping them strongly with iron, and securing them in strong wooden frames, and the heads with wedges. In the height of the fermentation, I have frequently seen the wine oozing through the pores of the staves.

"These hogsheads were left, all the depth of winter, in the cool barn, to reap the benefit of the frosts. When the fermentation was over—which was easily discovered by the cessation of the noise and oozing; but, to be more certain, by pegging the cask, when it would run quite clear—then it was racked off into clean hogsheads, and carried to the vaults, before any warmth of weather could raise a second fermentation. In March, the hogsheads were examined; and if any were not quite fine, they were fined down with common fish-glue, in the usual manner: those that were fine of themselves were not fined down; and all were bottled about the end of March; and in about six weeks more they would be in perfect order for drinking, and would be in their prime for above one year; but the second year the flavour and sweetness would abate: and would gradually decline, until at last it lost all flavour and sweetness; and some that I kept sixteen years became so like OLD HOCK, that it might pass for such, to one who was not a perfect connoisseur. The only art I ever used to it was putting three pounds of sugar-candy to some of the hogsheads when the wine was first turned from the press, in order to conform to a rage that prevailed to drink nothing but the very sweet Champagne.

"I am convinced much good wine might be made in many parts of the south of England. Many parts are south of Painshill; many soils may be fitter for it, and many situations must be so; for mine was much exposed to the south-west wind (the worst of all for vines), and the declivity was rather too steep: yet, with these disadvantages, it succeeded for many years. Indeed the uncertainty of our climate is against it, and many fine crops have been spoiled by May frosts and bad summers; but a good year balances many disappointments."

DR. MACCULLOCH'S MODE OF MAKING UNRIPE GRAPE WINE.

"It has been fully proved, that a compound, an artificial *must*, can be fabricated from due mixtures of sugar, with the extractive matter and saline substances of fruits, capable of undergoing a regular fermentation and of forming good and perfect wine.

"The case is as applicable to the grape as to the gooseberry. Long ago, experiments were made in France by several chemists, with green grapes and sugar, with complete success. I have repeated these experiments, and varied them with the best effects. The produce is varied with the management, and the results of the trials have been wines resembling Champagne, Grave, Rhenish, and Moselle, and of qualities so perfect, that the best judges and wine tasters have not been able to distinguish them from foreign wines. The grapes may be used in any state, however immature. When even but half grown, and perfectly hard, they succeed completely. It is evident that wines made on this principle will be more expensive than when made from ripe grapes, as a sufficient quantity of sugar must be used, to compensate for the deficiency of the natural sugar of the grape. But even then they are no more costly than currant or gooseberry wines, while at the same time their superiority is beyond all comparison. The hardest grapes will produce a wine of the strength of White Hermitage, with a proportion of 3 lbs. of sugar to the gallon; and the expense will be trifling compared to the value of the produce. It might be supposed that these wines would necessarily be devoid of flavour. But this is by no means the case, since all the specimens which were made under my direction, were characterised by flavours as genuine and decided as those of the foreign wine to which they approximated. I have little doubt that, under due management, on a large scale, as with sufficient age, wines of the Hock quality could equally well be produced here in the same way. Many trials must yet be made before we can hope to appreciate the extent of our resources in this manufacture.

"It is more than probable that different grapes, even in this immature state, would produce different wines; but these trials must be left to the efforts of individuals, and to the necessarily slow progress of experiment. With regard to the management, it must be founded on the operations followed in the wine countries, and of which a sufficiently full account for all the purposes of practice has already been given.

"It is in the first place obvious, that the grapes should be suffered (from motives of economy) to remain on the vine while there is any hope of gaining an accession either of strength or sweetness. They should then be carefully separated from the stems; those which are mouldy or rotten being at the same time rejected. Some judgment will be required in proportioning the fruit to the water, in the first instance, and to the sugar in the second. I have before said that the grape, when ripe, consists of sugar, combined with vegetable extractive matter, or the fermenting principle, and certain salts, besides the astringent and flavouring matter. As the colour is not developed in the immature grape, it need not be noticed here. But the proportions of these ingredients vary materially, according to the state of maturity. As a great part of saline, and other constituents of the grape, appear to be converted into sugar during the progress of maturation, it is plain that, weight for weight, there will be more of the principles contained in the immature than in the mature fruit. To form, therefore, a *must* of such a quality as shall resemble the natural *must* of ripe fruit, it is necessary that water should be added to the immature juice, for the purpose of diluting, and thus diminishing, the proportions of those saline matters, which would otherwise confer on the wine a degree of harshness difficult to overcome.

" As it is impossible to give positive rules to meet the infinitely varying and indefinable degree of maturity in which the grapes must often be used, and as such rules would, in fact, but tend to mislead, I shall content myself with laying down some general principles, leaving the application to the ingenuity and observation of the operator. If the object be to produce a wine like Champagne, or the White wines of Bourdeaux, a small proportion of crude grape will be required. Grapes barely half grown require, for the production of wines of this class, to be used in the proportion of equality to water. If they are more grown, the proportion may be increased; if less, it may be diminished. If the intention be to make a wine resembling Hock, the proportion of grapes must be materially increased, and the wine, at first harsh, austere, and not drinkable when new, will, by a few years' residence in the cask, undergo that amelioration which time alone can give. To the proportions which I have described varying quantities of sugar may be applied.

"A proportion of two lbs. in a gallon of mixture will yield a very light wine, and of no great durability, resembling under the proper treatment, the inferior classes of Champagne wines, and, under a different mode, a wine resembling Barsac, and the lighter of the Bourdeaux wines. An increase of sugar to three pounds will yield a wine equal in strength to the best sorts of Champagne, or, if fermented to dryness, to the strongness of the White wines of Bourdeaux. Larger doses of sugar will doubtless yield wines of different qualities; but of such proportions I cannot speak from experience. I may only caution the operator, who shall undertake these trials, that larger quantities of sugar require larger proportions of fruit, if it be his intention to work the wine to dryness, as the quantity of fruit above mentioned, is but barely sufficient to convert the proportion of three lbs. above named. With regard to the durability of these wines, I may add, that I have kept them for seven years, and during all that time with evident improvement. I should consider them to be as little liable to destruction as foreign wines of the very best fabric. While on the subject of sugar, I may also say, that the general cause of failure in those wines which are made in this country from ripe grapes, is the deficiency of sugar, and that even these would be much improved by an addition of it. It is owing to this deficiency that these wines are perishable, and easily converted into vinegar, the natural *must* being too aqueous to produce a durable wine. The proportion of sugar need not be larger in these cases; but, as before remarked, no positive rules can be given for it, since it must vary with the maturity and saccharine quality of the fruit, circumstances which differ almost every season. Two modes of management may be adopted with regard to the fruit, either subjecting the skins to fermentation or not. In the first case, a greater degree of austerity will be the consequence; and the wine will consequently vary in its qualities. If the object be to make a wine resembling Champagne, the skins may be separated previously to the fermentation. If this manufacture be conducted on a large scale, the result of the second pressing may be reserved to make a distinct wine. If on a small one, it may either be mixed with the first, or rejected altogether. The methods of conducting fermentation as well as all the after management, need not be repeated here as they are to be found in another part of the book. It is equally unnecessary to repeat, that wines produced in this way may be modified, either in flavour or colour, by the several expedients already detailed. But let me again inculcate, that the wine is not made when the ingredients have been introduced into the vessel. It is then that the labour begins, and nothing but care and attention to every part and every minute circumstance of the subsequent processes can ensure satisfaction, and produce valuable results. To such uses may the immature fruit of the vine be converted; but the capacities of that plant are not even yet exhausted.

"Situations may be found in this country where the vine may not produce even immature fruit; yet still it can be directed to the end of wine-making. Chemical examination has proved, that the young shoot, the tendrils, and the leaves of vine, possess properties, and contain substances, exactly similar to the crude fruit.

"It was no unnatural conclusion, that they might equally be used for the purpose of making wine. Experiments were accordingly instituted in France with this view, and they have been repeated here with success. From vine leaves, water, and sugar, wines thus have been produced in no respect differing from the produce of the immature fruit, and consequently resembling wines of foreign growth. The few experiments which I have tried have been eminently successful. No farther rules can be given respecting the management of the leaves, in addition to those I have laid down for the treatment of the unripe fruit. Similar proportions and similar management will in both cases, produce similar effects. The leaves, however, scarcely yielding any thing to the press, require to be infused in the water some days before they are subjected to fermentation; and they seem to yield their soluble parts most readily to boiling water, without any material alteration in the result. The leaves of the Claret vine, thus treated, produce wine of a delicate red colour. Tartar appears also to be a useful addition in this case; and it may be added in the proportion of half a pound, or even one pound, to ten gallons of the *must.* One advantage results from the use of the leaves. This is, the facility with which they are re-produced during the growth of the vine; and thus, the produce of a small vineyard in leaves alone will be abundant; and that even of a single vine will be as great as is required for the use of most families, should they make this wine for their sole consumption. Let it always be remembered, that in all these cases the price of the sugar is the price of the wine. The expense of utensils and labour is comparatively trifling, and when the manufacture is on a small scale, is scarcely worthy of regard."

MACQUER'S MODE OF MAKING UNRIPE GRAPE WINE.

The following are the means used by the celebrated French chemist Macquer, in making wine from unripe grapes, with the results:—"In the month of October 1776, I procured from a garden in Paris a quantity of white grapes, sufficient to make 25 to 30 pints of wine.* The grapes were of the worst kind: and I chose them in so bad a state of maturity, that it appeared perfectly hopeless to make them into a drinkable wine. Nearly half the berries, and even entire clusters, were so green, that their acidity was insupportable. Without any other precaution

* The old Paris pint contained two pounds of water, and was therefore equal to one-fifth of our new imperial gallon.

than merely picking out the spoiled raisins, I caused the rest to be bruised along with their stalks, and the juice to be pressed out with the hand. The *must* was very foul, of a green colour, and had a mixed taste of sweet and sour, in which the latter was so predominant that it set the teeth on edge. I dissolved in this liquid a quantity of coarse sugar, sufficient to give a good degree of sweetness to the *must;* and, without further preparation, I put it into a cask which stood in an arbour at the bottom of my garden, where I left it to its fate. The fermentation commenced on the third day, and continued for eight days in a very moderate, but obvious manner; after which time it ceased to be sensible.

"The wine being newly made, and still thick and impure, had a vinous odour, sharp and lively. The taste was rather harsh, for that of the sugar had disappeared as completely as if it never had existed. I allowed it to pass the winter in the cask; and on examining it in the month of March I found that, without having been fined or racked, it had become transparent. Its taste, though still a little sharp, was nevertheless much more agreeable than it was immediately after the sensible fermentation had ceased. It was a little more soft and mellow, but it had not the least approach to sugar. It was then bottled, and, on examining it in the month of October 1777, I found it was pure, fine, very brilliant, agreeable to the taste, warm and generous, and, in a word, like good white mellow wine made from the ripened grapes of a good vineyard in a favourable season. Many connoisseurs who tasted it gave the same opinion, and could not be made to believe that it was produced from green raisins and sugar.

"This success, which had surpassed my hopes, induced me to make another experiment of the same kind; which was still more decisive, on account of the extreme greenness and bad quality of the grapes which I employed.

"On the 6th of November 1777, I had collected, from the top of a summer-house in a garden at Paris, a species of large *raisin*, which never ripens well in this climate, and which we know by the name of *Verjus*, because its juice is chiefly employed in the kitchen as an acid seasoning. That of which I speak had scarcely begun to colour; although the season was so far advanced that it had been abandoned, without any hope of its acquiring sufficient maturity to be eatable. It was still so hard that I was obliged to heat it on the fire before I could extract its juice, of which at last I procured from eight to nine pints. This juice had a very sour taste, in which a slight sweetish flavour was with difficulty discovered. I dissolved in this *must* portions of common brown sugar, until it tasted very sweet. It required a greater quantity than in the former experiments, because its acidity was much stronger. After the dissolution of the sugar, the taste of the liquor, though very *sweet*, was nevertheless far from flattering; for both the *sweet* and the *sour* were strongly and separately felt, so as to be extremely disagreeable to the palate.

"I put this peculiar *must* into an earthen jar, which it did not entirely fill, and covered it simply with a piece of cloth. The season being already very cold, I placed the jar in a room in which the heat was almost always kept at about 60°, by means of a stove.

"After a few days the fermentation was scarcely sensible. The liquor seemed to me to be quite as sweet and acid as before; but the two flavours began to be better combined; and, on the whole, the taste was more agreeable.

"On the 14th of November, the fermentation was in full force: and a lighted taper, introduced into the empty part of the jar, was instantly extinguished.

"On the 30th, the sensible fermentation had entirely gone; and the introduced taper was no longer extinguished. The wine was, nevertheless, still very foul and milky. The savour had retained scarcely any sweet. It was brisk, sharp, and pleasant, like that of warm and generous wine; but it was a little tart and gaseous.

"I bunged up the jar, and placed it in a temperate situation, in order that the wine might improve by completing its insensible fermentation during the winter.

"At last, on the 17th of March 1778, having examined this wine, I found it almost totally transparent. Its remaining sweet as well as acid taste had completely disappeared. It was that of a wine made from strong good grapes, and by no means unpleasant; but it had no perfume or *bouquet*, because the *raisin* we call *verjus* possesses no odorous principle: further, this wine, being yet new, having something to gain from the insensible fermentation, promises to become still more mellow and pleasing."

In consequence of the great success Macquer met with, many others were induced to follow his example, until the practice of making wine from a green grape has become very common in the north of France. Macquer does not inform us what quantity of sugar he employed. To make wine from green grapes of this country, we would require to put water, or the quantity of our wine would be very small. There can be no doubt but the juice of unripe grapes would give us a gravity of 40. Now by employing 25 per cent. of water, or one-fourth water and three-fourths juice, it would reduce the 40 to 30; and bringing the *must* up to the standard gravity 120, we would require 90 to be made up with sugar, which would take two and a half pounds. I can have no doubt, but by following his example, after having attenuated it to 20, and bottling it off before the March following, no one could tell it from Champagne of a foreign growth.

WINE MADE FROM THE LEAVES AND CUTTINGS OF THE VINE.

Wine made from the leaves of the grape, as well as from the cuttings of the vine, is highly prized, and does not appear so decidedly a domestic wine as most of those made in this country, resembling in flavour more the foreign wine. The cuttings seem best calculated for making this wine. The best time for using them is at the second cutting of the vine, when they are to be carefully collected, and put into a large tub: should there not be a sufficient quantity of cuttings, the deficiency may be made up with leaves; they must be closely pressed in the tub, and as much boiling water put upon them as will cover them. When the heat is reduced to 60 degrees, it is advisable to take a sample for examination by the saccharometer. The whole is to be allowed to remain in the tub for several days, frequently stirring it. The original gravity will be low, and when by the saccharometer it is found to be decreasing (which will not be for a few days), the liquor is to be strained off from the cuttings, the latter being squeezed. A gallon or two of boiling water again put upon the cuttings, and allowed to remain until the heat has fallen to 80° or 90°, when the liquor is to be strained off (squeezing again the cuttings), and added to the former quantity. The whole is now to be measured and weighed, and the deficiency of gravity made up by adding sugar, either moist or lump, as the operator chooses, until the standard of 120 is obtained. If the fermentation appears languid, it is advisable to take out a quart of the liquor, warm it to 90°, and break into it a wine glassful of good brewers' yeast until it is found to have increased its bulk one-half; when it is added to the whole liquor or *must*, mixing it well up, when there is little fear of fermentation being again vigorous. The after management is to be exactly the same as in the wine made from the unripe grapes quoted from Dr. Macculloch.

RAISIN WINE.

This wine, more than any other, resembles Foreign wines, particularly such as are made in Italy, and Cyprus, and various other parts on the shores of the Mediterranean. Great attention, however, must be paid to the four following particulars. First, in the procuring of the best Raisins. Secondly, in the careful separation of the stalks. Thirdly, in the infusing of a judicious proportion; and lastly, in the obtaining of a desirable fermentation. When these particulars are pointedly attended to, and the after management (the details of which will be fully entered into) is properly carried through, so close is the resemblance to the Foreign wines just mentioned, that the most competent judges are unable to distinguish the difference; but indeed, when we reflect upon the subject, namely the conversion of the grape into the raisin, we shall not be surprised at this result. Thus it is evident, Raisins are merely grapes which have been deprived through the influence of the sun of the greater portion of the water they contained, and by means of this process of evaporation, the remainder of the water combining with the saccharum and acid, or tartar of the grape, forms a new agent—Sugar. It is well known by those who have given their attention to the subject, that water and acid are ingredients indispensable to wine making; consequently, if we restore these two ingredients to the raisins, of which they have been deprived, we have the same materials to work upon as the Foreign wine-maker has in the grapes: nay, we have more, for we have a manufactured sugar in the raisins to increase the gravity which he has not in the grapes, whilst we have also an abundance of natural leaven to decrease that gravity. I may just here notice, that we have even an advantage over the Foreign makers, especially those of Germany and the north of France, in the *quantity* of this natural leaven. A great portion of their grapes have rather too much of this last element, and in consequence, fermentation is so violent, that before the preventive can be used, their *must* has run from the vinous to the acetous fermentation.

There are various methods of making raisin wine, but the following is the one I have practised with perfect success, and it appears to me in every respect preferable to all others. It may be as well, however, before proceeding farther, to relate the fact that many thousand pipes of raisin wine are yearly made for the purpose of adulterating Foreign wines.

The raisins which I use are Valentias, the price averaging about forty shillings per hundred weight. Perhaps it may be unnecessary to say, that the very best of this class of raisins ought to be selected. In cases where these cannot be obtained, the best "Malagas" should be used, I mean those which are imported in matts, weighing about fifty-six pounds each.

Raisin wine may be made either sweet or dry according to the wish of the maker. The first part of this process, which is very tedious, but absolutely necessary, is the careful separation of the stalks from the raisins, for, were the former allowed to remain, the whole of the time the fruit is infusing, a very astringent and disagreeable flavour would be imparted in the first place to the *must*, and eventually to the wine.

There is in the raisin an abundance of fermenting matter—natural leaven—to produce a spontaneous fermentation without having recourse to artificial means—that is to say, if a sufficient proportion of raisins is used.

To turn out eighteen gallons of wine, after having been duly fermented and racked off, ready for bottling, twenty gallons of *must* ought to be made. To make this quantity, six pounds of raisins should be used to each gallon of water, consequently these twenty gallons will require one hundred and twenty pounds of raisins. It may be laid down as a rule which has no exception, that not only is it more profitable to make a large than a small quantity of wine, but the quality of the wine is thereby greatly improved, on account of the fermentation proceeding with more alacrity and with more equability in the one case, than in the other.

As this wine is made in winter or in the early part of spring, the cask chosen for infusion should be placed in a warm situation, the head having been previously taken out. The raisins duly stripped from the stalks are then put into the cask with about seventeen gallons of water, which has been heated to 90°. The one best calculated for infusion, and which I would recommend, is a Marsala hogshead, the average guage of which is about forty-six gallons. The stalks from which the raisins have been stripped having a portion of the sugar still clinging to them, are to be thoroughly deprived of it, by washing them with three gallons of water. When this is done the water is then to be drained from the stalks and added to the seventeen gallons in the infusing cask, making the quantity twenty gallons, and then the whole mass is to be well stirred up.

Were it advantageous to extract by one infusion, the whole amount of the saccharum or sugar of the raisin, we should have at the close of fermentation twenty gallons of *must* with a gravity of about 108. This, however, would not be advantageous, because if the raisins were so long infused as to obtain this gravity, the fermentation would have acquired such power before the accomplishment of it, as not only to have deprived them of the whole of their sweet, but also to have extracted much of the bitter, extraneous matter which the husks contain. This in many instances not being attended to,—no doubt from false ideas of economy which suggest the obtaining of all the value that is possible,—is the cause why we often find raisin wine not so mellow and palatable as it ought to be. This fact being admitted, instead of endeavouring to obtain a gravity of 108, which one hundred and twenty pounds of raisins in twenty gallons of water will produce, we must be contented with obtaining 90 of gravity, and leave with the pressed raisins 18. It must be understood, however, that the remaining gravity of 18, left in the pressed raisins, is of very inferior quality. If desired, it may be extracted by a second infusion, but this will be noticed hereafter.

The operation of stirring and bruising the fruit in the infusion cask, must be carefully performed three times a day for eighteen days, more or less, according to the temperature of the atmosphere. A sample of the *must* should be taken out morning and evening, for the purpose of being examined by the saccharometer, and the gravity noted, for as long as the *must* continues to increase in gravity, and even after attenuation has become apparent; fermentation is still at work extracting saccharum from the fruit, as it is carrying on two processes at the same time, that of extraction, and that of attenuation. In the early stage of fermentation there is much extraction, and little or no attenuation; but as the temperature of the *must* increases, which is always the case from the middle to the latter stages, the attenuation goes rapidly on, and even so much so, that a considerable quantity of good which has been extracted from the raisin is not indicated by the instrument.

Whenever the gravity is found rapidly to decrease, that is to say, when upon examination we find the *must* has attenuated two to three on the glass saccharometer, which is equal to 10 to 15, during the last twenty-four hours, it should no longer be allowed to remain with the raisins.

A cask similar to that in which the raisins are infusing, but only of the guage of about 30 gallons, which we will designate the *fermenting cask*, is to be placed if possible in a still warmer situation, and a sieve with a frame under to support it, is to be placed over the tub. The mass from the infusion cask is then baled out, and run through the sieve; the raisins at the same time being squeezed and pressed with the hands, are thrown into another vessel ready to receive them, where they remain until the infusion cask is emptied.

Should the wine-maker have conducted the process up to this period judiciously, he will have at least twenty gallons of *must* of a gravity of about 80 instead of 90; this seeming difference of 10 arises from the cause before alluded to, namely, that fully this amount has been attenuated during the period of extraction, and as it is not shown upon the saccharometer, it is lost sight of. Therefore, let it be borne in mind, that whatever we find the *must* to be, after it has been strained into the fermenting tub, ten additional gravity should be added to make up for this attenuation.

We have now twenty gallons of *must* in the fermenting tub, of a gravity shown by the saccharometer 80, and allowing 10 for the attenuation referred to, we consider it ninety; and we have now only to bring it up to our proposed standard by the addition of sugar.

The gravity which I have found to be the best for making raisin wine is 135, but 125 will produce a wine of very excellent quality. Let us consider that we assume the gravity to be 135. We have in our fermenting tub twenty gallons of *must* at 80 of gravity, called 90, therefore to make up the *must* to 135, forty-five of gravity is to be made up by sugar. This will take twenty-six pounds, being at the rate of one pound and rather more than a quarter for each gallon. One pound of sugar of good quality to each gallon of *must* will raise the gravity at any rate thirty-five; but to make it more intelligible, suppose we were to take from the fermenting tub a gallon of the must which is, as before stated, at a gravity of 80, but to be reckoned 90, allowing for the 10 attenuated as before noticed, and put into it one pound of sugar, mixing them thoroughly, so that they shall be completely amalgamated; then upon examination by the saccharometer we shall find an increase of gravity thirty-five, bringing the eighty up to one hundred and fifteen, but really one hundred and twenty-five. We have still a deficiency of ten of our proposed standard 135; were we to add one half pound more of sugar to it, it would be too much, for it would raise the gravity to one half of the thirty-five, namely, seventeen and a half, whereas we only require ten; now as it will be seen that one pound of sugar will give an additional gravity of 35 and a half pound, the half of thirty-five, seventeen and a half, of course a quarter of a pound, will give the half of seventeen and a half, namely, eight and three quarters; then there would be a deficiency of one and three quarters, and for this deficiency I have allowed a pound, that is, twenty-six pounds of sugar to the twenty gallons of *must* instead of twenty-five.

On examining the *must* now by the Saccharometer, we shall find that the twenty-six pounds of sugar have raised the gravity to one hundred and twenty-five, and by allowing for the ten of gravity attenuated in the infusion, our proposed standard is attained. Should the weather be very cold it will be necessary that the fermenting tub be placed in a room where there is a fire constantly kept, lest the fermentation be checked. The temperature of the room should be kept as near as possible at 55°. The process of stirring, or rousing the *must*, and examining it, is to be gone through every morning; and if fermentation is not checked by cold or other casualties, in the course of a week the gravity will likely fall to between ninety and one hundred: but this will in a great measure depend upon the warmth of the weather, and the punctuality with which the *must* is agitated.

At the time of making up our final gravity by the addition of sugar, we must not forget that one of the necessary agents for carrying fermentation successfully through is a-wanting, namely, acid. Of late years, instead of making use of argol, which I found to be very troublesome in preparation, and capricious afterwards in its result; I have made use of tartaric acid, and in a proportion of one pound to sixty gallons. At the same time, it may be as well to state, what perhaps is not generally known to domestic wine-makers, that tartaric acid is made from argol, and argol is the real tartar of the grape; consequently by using tartaric acid, we only restore to the juice of the raisin what it had been deprived of.

When the *must* has fallen to the point of gravity 90, it may be put into the casks for final fermentation. This operation will tend to check fermentation; but to avoid danger, I would advise that the casks be washed out with boiling water, and the *must* put in whilst they are warm. Attention should be paid to ascertain that fermentation has not been seriously checked by the operation. If this evil has taken place, the *must* will be dead, and will not throw up the scum, whereas if it was going on properly it would do so. Should the *must* remain in this dead or rather dormant state, for twelve hours, a small portion, say three table spoonsful, of good thick brewers' yeast should be mixed with a quart of this *must* heated to 85°. This heated *must* and yeast must then be put into a vessel capable of containing two quarts, as it will expand. In about an hour after this, expansion will take place and be accompanied by a lively fermentation. At this period it should be put into casks, and the whole liquor well roused up, when there is little doubt it will have the desired effect. With raisin *must*, it is a rare case that artificial means are necessary to excite fermentation. It is rather inclined to ferment too violently; in which case it requires to be checked, as this evil is attended with more danger to the wine than languid fermentation. There are various methods of checking too violent fermentation, and these I shall take occasion afterwards to describe.

Casking.

The casks should be placed with the bung-hole obliquely inclined, so as to allow the scum or yeast which the fermentation throws up, to flow readily out. The casks should be so elevated, and the stands so contrived, as to allow under each cask a tub of sufficient capacity to hold the whole of the wine at the time when it is necessary to rack or decant it. All the time the *must* is fermenting in the cask a dish should stand under each (if two are to be filled, as we have supposed), for the purpose of receiving the discharged liquor or scum, or more properly speaking both. From time to time the fine must be run off from the dishes into the vessel containing the liquor reserved for filling up. With the generality of wine-makers the business is now over. They bung the wine up according to receipt, at a fixed period, put it into the cellar, and think no more about it, until, as informed by receipt, the time has arrived when they should bottle it. When they come to examine it, they find the bung out, or partially so; and instead of the contents of the cask being wine, they are too frequently found to be moulded vinegar. Those who are conversant with the subject, know that even from this period increased attention and skill are requisite to direct them to avoid either too much or too little attenuation, that is, too much or too little decrease in the gravity. There can be no doubt that the precaution used at the commencement of this intricate stage—as it may well be called—determines the early or late period of natural fineness, the wholesomeness or unwholesomeness of the wine, and creates from the same materials different distinctions in the flavour. But strict attention to the several stages of its progress is also absolutely necessary to fix the principles of preservation and flavour.

To return to the wine which we left newly casked at the gravity of about 90, though it may be more or less as before noticed, the *must* (being properly now called wine, as it is vapid and void of sweetness), should it ferment too rapidly, a circumstance which is easily known by the excess of heat and the too rapid decrease of gravity, ought to be racked from its lees in order to check the violence of its fermentation; if this were not done it would proceed from the vinous to the acetous stage, and vinegar would be the result instead of wine. It may be observed, however, that there is no danger so long as the gravity continues at between 40 and 50; indeed in no instance should it be racked off until it reaches that gravity. By this operation it is deprived of a quantity of natural yeast, which has mixed and subsided with the lees. Both the yeast and the lees have a tendency to over-excite fermentation; but their separation from the wine by racking checks this tendency, not so much so, however, as to deprive the wine of the desired attenuation of the remaining saccharine matter. For as long as any portion of this matter remains, fermentation, visible or not, in the cask or in the bottle, gradually or rapidly, will not cease. The fine being racked off into the tub, the lees must be turned into a separate vessel, and the large cask well washed, slightly sulphured, and two bottles of brandy put into it. The cask is now to be shaken, so that the brandy may wet every part of the inside. The fine wine is to be returned into the cask, after a portion of it has been examined with the saccharometer ; the deficiency caused by the loss of lees made up, by taking the fine from the small cask, and the lees from the large cask put into the small one. Care must be taken that the cask is quite full before it is bunged up. A small bung must be put in first, in order to allow some portion of the gas to escape, and it should remain, until by the saccharometer, you ascertain that the gravity of the wine is reduced to between 30 to 35. At this period it should be fined and bunged tightly down, after having made a spile or air-hole at the top of the cask, an inch or two from the bung-hole, and a peg or spile put slightly in. If you have found by the saccharometer, at this last trial, the gravity of the wine so low as 15, or under (which is seldom or never the case), it must be racked again, and treated as before ; that is, by sulphuring the cask, and so on ; and the wine is again to be fined and the cask bunged tightly down, the spile to be left out for a day or two, and then to be placed firmly into it. The spile may be taken out at the expiry of a week ; and should the appearance of fermentation have subsided, the gas will escape without any froth arising. If this is not the case, and froth does arise with the escape of the gas, the bung must be taken out, and the cask filled up with brandy. The bung is then put tightly in again, and the spile left out for a few hours.

When Malaga raisins are used in the manufacturing of this wine, it ought to be made in the month of February or March. Should the operator wish its colour to resemble Sherry, by the addition of 10 lbs. of Smyrna raisins to the Malaga, his end will be attained, and the wine will also be improved in richness and flavour. I have also found, by the addition of argol, one ounce to each gallon of *must*, with three ounces of salt to 19 gallons after the operation of pressing, having been previously dissolved in a small portion of water heated to 180°, and put into two quarts of the *must*, that the wine is also greatly improved. Indeed the advantage of argol to every home-made wine, to this or to a less extent, is beneficial. But as I intend to enter more fully on the properties of this acid in another part of the present treatise, it is unnecessary to dwell upon it here.

This wine should remain in the cask as long as possible, and at the earliest should not be botled until after the following spring. But if it is allowed to remain in the cask a few months longer, even till the end of autumn, it will add greatly to its brilliancy, as well as to its vinosity.

N.B.—Raisin wine made after this receipt will not be a dry wine, but a rich one resembling Mountain.

SECOND INFUSION OF RAISIN WINE.

We now return to the squeezed or pressed raisins, which had been laid aside to be put into the infusing tub to exhaust, (if it be thought advisable) their remaining value, namely, eighteen gravity per gallon if for the twenty gallon, being equal in weight to a little more than twenty pounds of raisins, although this value is very inferior in quality. Were we to put twenty gallons of water upon these squeezed raisins, this quantity would, even if it were possible to extract the whole of their value, only give a gravity of about 18. But this is not possible, therefore the fact must be admitted, that even after a second extraction there will remain some value in them, especially when so small a quantity is infused. This arises from the fermentation having been so materially checked by the various processes the raisins have undergone, and by which they have been deprived of the greater part of their natural leaven. When water is again put on them, it will deteriorate the very small remaining portion of their fermenting principle (that is natural leaven,) so as to render it impossible to extract the whole of the good they contain.

The question now comes to be, whether it is politic or not to have a second infusion; for there can be no doubt that a small quantity of wine could be made, although the quality would be inferior to the first. As I am inclined to think it would be the wish of almost every domestic wine-maker to know how to accomplish this object, I may just offer a few details.

The infusion cask, before the pressed raisins are put into it, should be placed sufficiently high to admit of a pail or tub to stand under it. A hole to be made in front of the cask very near the bottom, and a cork put in. The cask being so placed, the pressed raisins are thrown in and five gallons of cold water put upon them. It is to be stirred up morning and evening for about six days, and at each time, examined by the saccharometer as in the first infusion, when most likely it will be found that for the first two or three days, there will be an increase of gravity, and after, from the fourth to the sixth day a decrease. With a second infusion, it is necessary to note the highest gravity the saccharometer has indicated, so that the operator may have *data* to guide him to portion the sugar necessary to bring up his final gravity to the standard he has fixed upon. It is likely he will find his highest gravity has not been above forty-five. At the expiry of six days, if the gravity has been decreasing for the last twenty-four hours, a tub may be placed under the infusion cask, and the *must* drawn off into the tub which has been placed under it for this purpose. And this *must* is to be treated in a similar way to the first, by measuring the quantity into a cask for fermentation.

In the fermenting cask there are now little more than four gallons of *must*, the remaining gallon being still with the raisins. It will take nearly twenty-four hours to drip this gallon from them, a pail having been placed for the purpose of receiving it. When the raisins are perfectly dry, the contents of the pail should be added to the *must* in the fermenting cask, which will then measure five gallons of a gravity of about forty. This forty should be considered forty-five, to make allowance for the attenuation which has taken place during the stage of infusion, and which has been lost sight of. To bring this up to the same gravity as the *must* of the first infusion, he will require thirteen pounds of sugar for the five gallons, being rather more than two and a-half pounds to each gallon. To exemplify this, one pound of sugar in a gallon increases the gravity thirty-five, two pounds of course will increase thirty-five more, making it seventy, and one-half pound the half of thirty-five, namely, seventeen and a-half, which, added to seventy, the gravity of the two pounds of sugar, will make it eighty-seven and a-half, and this eighty-seven and a-half added to forty-five the gravity of his *must*, will bring it to $132\frac{1}{2}$, when the additional half pound of sugar will very nearly make it 135.

But now comes a very essential point to be considered, for, with a second infusion a great difficulty arises in obtaining a healthy fermentation, occasioned by this *must* possessing so very small a portion of that natural leaven which is indispensible for attenuating so great a body of sugar to a desirable point; the operator must therefore have recourse to artificial means, and the best means is brewer's yeast. For the five gallons, now by the addition of the sugar, brought up to nearly six gallons, he will require almost a half pint of good new strong beer yeast. About a gallon of the *must* should be taken from the cask, warmed from 85° to 90°, and the yeast with about one ounce and a half of tartaric acid well mixed into it, this mixture is then to be placed before the fire, until it has considerably expanded, when it is put into the fermenting cask and the whole thoroughly mixed up. The after processes are carried on exactly in a similar way to those of the first infusion.

DRY RAISIN WINE.

To make the same quantity of wine as in the former receipt, two lbs. of raisins additional to each gallon of water, making in all eight lbs. of raisins to each gallon of water, ought to be used. Seven lbs. would make an excellent wine, but eight lbs. will produce one greatly superior. The fruit is to be stalked, steeped, and treated exactly in the same manner as in the former instance; while the *must* ought to be examined as frequently as before, and regularly noted. This *must* requires no sugar. It does not require any difference in the process, except reducing its gravity, before being casked, to 65 to 70, or as nearly as possible to one-half of its original gravity, instead of to 90 to 100, as in the case of the former wine. As it is almost impossible to reduce a small quantity of *must* with the same accuracy as a large one, the small quantity not retaining its own heat, we should endeavour to remedy the defect by taking out a portion of the *must* occasionally, warming it to the degree of 96, or 100, and mixing it again well with the whole body of *must*. Raisin wine, however, without sugar, even when made in so small a quantity as 17 gallons, seldom requires this remedy to invigorate it, if due attention is paid to the agitating of it evening and morning. When it is casked, it is to be treated exactly in the same manner as the raisin wine with sugar, except that the gravity of dry raisin wine is to be reduced to 15 to 20 instead of to 30 to 40. If to each gallon of this *must* a quarter of a pound of virgin honey is added, having been previously boiled up with a small portion of the liquor taken from the second pressing of the raisins, and well skimmed (to the extent of half a pint to each quarter of a pound of honey), the wine will have imparted to it a delicious mellow flavour.

If to either this or the former wine two gallons of Bronte Madeira be added to the seventeen at the time of racking, its flavour will be completely altered, and a foreign character, somewhat resembling that of Lisbon wine, will be imparted to it. At all events, the peculiar characteristic of home-made wines will by this treatment be completely destroyed. Bronte Madeira may cost about 10 or 11 shillings per gallon, so that by using it, the price of the home-made article will be somewhat raised.

CURRANT WINE.

Currant Wine has been gradually growing out of repute, until it has at length obtained a very bad character; and I greatly fear that all I can say in its favour will not induce the reader to make it, unless he is provided with an abundant supply of currants in his own garden. To those, however, who have a sufficient quantity, I would beg to address myself, assuring them, that by close attention to the following formula, they will find themselves well rewarded by obtaining a delicious wine at a very moderate expense. The currants should be dead ripe; for the riper the fruit is, it contains the less malic acid, and consequently requires a smaller quantity of sugar to bring up the *must* to the proper standard. They should also be gathered in a dry, warm day, and separated from the stalks. A barrel without the head, which will contain 36 gallons, is the proper vessel in which to conduct the first part of the process. To make 20 gallons, two casks, one of 15 gallons, and the other of 2, are here again required. The quantity of currants employed for this is 16 gallons of white and 7 of red; 23 gallons in all. The fruit is lightly squeezed in small portions with the hand, into the barrel without the head, that every individual currant may be broken. The whole of the fruit being well squeezed, the mass is roused up, and a portion of the juice taken out and examined by the saccharometer, for the purpose of being noted. The mass is allowed to remain until, by the saccharometer, a decrease of gravity is ascertained. At this period the juice is strained, the husks being particularly well squeezed and put into a separate tub, when two gallons of cold water are thrown upon them to extract the remaining good.

The pure juice is now measured, and a sample weighed, in order to ascertain what quantity of water ought to be mixed with it. Should the gravity of the pure juice be 60, which is the case in a very favourable season, the same measure of water as juice is used, which reduces the gravity to 30, the standard of juice and water of this wine. On the contrary, should the gravity of pure juice be only 50, that is one-sixth less, one-sixth less of water is used. The gravity 30 is brought up to the standard 120, by the addition of sugar, either moist or lump, as taste may dictate. The water which is used for mixing with the pure juice is cold spring water, and that which is strained from the husks, allowing 17 gallons of juice and water, 15 for the large cask and two for the small one; an extra quantity is required for losses during fermentation.

The reader will probably now wish to be informed what quantity of sugar is required for each gallon of juice and water, at a gravity of 30, in order to bring up the mixture to 120. By referring to the table of specific gravities he will find that the average gravity of raw or moist sugar is about a little more than 35, but the best sugar of this kind will give 36: so by mixing one pound of this with a gallon of water at the temperature of 60°, he will find his gravity to be 36. As this is the case, by mixing one pound of the best moist sugar to each gallon of juice and water, the gravity of which is 30, he will find by examination it will be increased to 66, namely juice and water 30, sugar 36. By mixing a second pound to each gallon the gravity will be raised 36 more ; this 36 added to the 66 will make 102. Now as we find one pound of sugar will give us 36, the half of 36 is 18 ; therefore by adding one half pound of sugar more to each gallon, he will increase the gravity 18, thereby bringing it up to the standard 120, viz.

Juice and water.........	30 Gravity.
1 lb. Sugar...............	36
1 lb. Do...................	36
½ lb. Do...................	18
	120

Should the operator find that the two pounds and a half of sugar have not given 90, that is, raised the gravity of the juice and water to 120; he must use more sugar until he accomplishes the desired end. As a guide, he may consider that each quarter of a pound of sugar to every gallon of the *must*, will increase the gravity 9. The sugar is to be properly dissolved, which takes some time. When this is completed, the *must*, being now in the fermenting tub, a portion is taken out, weighed by the saccharometer, and noted; and if deficient in gravity, made up as in the other wines, the manufacture of which we have already described. One half pound of argol broken into the *must*, in the same way as in the former wines, will improve the flavour, and greatly assist fermentation. Nothing now remains but to reduce the gravity by fermentation, and to attenuate it so low as to produce a perfectly clear and vinous liquor. Samples of the *must*, after the head or froth which fermentation causes to rise to the surface, has been broken in, are taken once every day and noted. This operation of breaking in, and weighing, is carried on every day until the gravity has decreased to from 80 to 90. This is not easily accomplished, however, if the quantity manufactured is too small.

We shall suppose, which ought to be the case, that the *must* is at 80 : it is casked in the manner already described. It is always advisable with those wines which derive their sweetness from sugar, to wash out the casks with boiling water, and to put in the wine while the casks are warm, in order to invigorate the languid fermentation. All wines made from the fruits of this country require sugar. With regard to this and all other wines, every inducement is used to encourage a vigorous fermentation, especially in a small quantity; for, as already stated, the heat so necessary to promote fermentation can only be equably kept up in a large quantity. If not sufficiently attenuated, a portion of the sugar will remain undecomposed, and the wine will have a dead, sweet, mawkish taste. The skill of the operator is now employed to carry on a steady and gradual fermentation. When it is languid, which is known by the appearance of the wine, various means are used to excite it. My method of procedure is to draw a gallon of the wine from the cask into a gallon measure. When full, the measure is put into a tub, and after boiling water is poured round it, it is allowed to remain until the wine ceases to rise in temperature. It is then returned into the cask, and the whole being well agitated, is put into a warm dry room, where it must be kept perfectly full. Should the wine appear again languid, the lees at the bottom, into which a certain portion of yeast has fallen, must be roused up with a stirrer, and well incorporated with the wine. These casks, as well as those containing the wines already mentioned, should be raised sufficiently high to admit of a tub being placed under each at the time of racking, and space left under them for a dish to stand, to receive the yeast which the wine gives off. Currant wine ought to be reduced in gravity at least three-fourths, that is to 30, before being bunged. If it can possibly be reduced four-fifths, it will be all the better for it. If the operator feels disposed to add either brandy or whisky, or rectified spirits, let this be done when the gravity is 70. The casks are filled and bunged down after visible signs of fermentation have disappeared. I beg to remind the reader, that the mode of racking, fining, and filling up the deficiency in the great cask from the clear of the small one, is the same in this as in former wines. In order to have a fine mellow wine, this should not be bottled until the November twelvemonth. One very general error which domestic wine-makers fall into, is that of bottling too soon. Nothing can render the wine mellow and sparkling, but age in the wood.

BLACK CURRANT WINE.

This wine is managed in the same manner as red currant wine. The gravity of the pure juice is in general much the same. If the currant bushes are so planted as to have a southern exposure, it may be rather higher. The pure juice and water, as in red currants, is brought to the gravity af 30; and the liquor increases in gravity to 120, by the addition of sugar, either moist or lump. I refer the reader to the general rules laid down in Red Currant Wine, for fermenting, casking, racking, fining, and with respect to the time of bottling.

BLACK CURRANT WINE TO IMITATE CONSTANTIA.

When this wine is properly made, it may very well be passed off for Constantia, and in fact it has been so.

Two measures of fruit and one of water are used; the fruit is lightly squeezed with the hand and put into a tub; the quantity of water intended to be used is then poured on it. The fruit and water are put into a copper and boiled for ten minutes, then drawn off and strained. The berries must be again pressed, and two additional gallons of water poured on the husks, to make up for the loss occasioned by boiling, and in order to extract the remaining good. This is also strained and added to the former quantity.

When cooled down to the temperature of 90°, the whole is measured, and a portion taken for examination by the saccharometer. Lump sugar is then added to bring up the gravity to 120 to 125. Pulverised or ground argol is then introduced, as already described, in the proportion of 1 lb. of it to 20 gallons of the *must.* A ferment is generally wanted in all liquors that are boiled. To carry on a perfect fermentation, therefore, an English pint of good, fresh brewers' yeast is broken in with the argol, and added to the compound when its temperature is 85°. Every means is used to assist fermentation, to attenuate the *must* to as near 50 as possible, which is the final gravity, instead of 35 as in other wines. The longer this wine is kept in the cask before bottling, the better.

WHITE CURRANT WINE.

I would advise the reader to boil the fruit employed in making this wine, as well as that which is to be the imitation of Constantia. Take as many currants as you may conceive to be necessary, remembering that the fruit rarely produces one half of juice. To make a 15 gallon and a 2 gallon cask, 20 gallons of fruit are necessary.

The fruit is to be picked from its stalks, lightly bruised, and two gallons of water poured on it. The fruit and water should then be put into a copper and boiled ten minutes, the liquor run off, the fruit squeezed, two gallons of water put upon the husks to extract the remaining good, and this water strained from the husks and added to the former liquor. Twenty days, more or less, previous to this, there have been steeped 56 pounds of Malaga raisins in ten gallons of water, the water being allowed to remain upon them, until, by the saccharometer, it is found that the gravity begins to decrease. It should be so contrived that the boiling of the currants may take place at this period, in order that the extract from the raisins may be immediately added to the juice of the currants. Two gallons of water are also poured upon the raisin husks to extract the remaining good. The whole liquor is now measured, weighed, and noted; and the deficiency in quantity made up with the water from the raisin husks, so that the whole may measure 17 gallons, and the deficiency of gravity made up with loaf sugar to the standard 120. One pound of argol is thoroughly dissolved in a portion of the *must* and broken into the liquor. This *must* requires no other ferment than the extract from the raisins and the argol, both of which contain a considerable portion of this necessary ingredient. The farther treatment of this wine is precisely similar to that made from black currants; and if it can possibly be attenuated, by keeping it in a warm room, to 35 instead of 50, it will prove a wine of a delicious flavour, no one being able to distinguish it from White Constantia.

CURRANT WINE BY ROZIER.

The following is the receipt for making Currant Wine from the pen of Rozier.

"Take," says he, "any quantity of currants that you please: but the greater the quantity, the wine will be the more perfect. Collect them when they are perfectly ripe, after the dew and moisture are dissipated, and the heat of the day has become strong. Expose the berries in the sun for some hours at least, and then separate them from their stalks; putting them into a tun, or into a cask, of which one end has been taken out, to serve for that purpose. They are then to be bruised as well as possible by wooden pestles.

"If the juice appears to be viscous, or too thick, add a few pints of water, but moderately, and only give to it fluidity; because without fluidity there would be no tumultuary fermentation, which is absolutely necessary for the purpose of separating the constitutent principles of the fluids which we wish to put into fermentation, and to assist them, by the division of their parts, in the formation of that ardent spirit which is the soul of all wines.

"If, on the contrary, the juice is too fluid, and does not contain a sufficiency of the saccharine principle, add a few pounds of sugar, stirring and agitating the whole until the additional *sweet* shall be perfectly incorporated.

"Fill your tun (or open cask) to within three or four inches of the top; and put it in a place of a medium temperature (60° to 70° of heat,) a situation to which you will be guided by the heat of the weather. If the place were too warm, the fermentation would be too tumultuous and rapid, and the wine would become acid. Cover the tun slightly with a piece of cloth, over which place its wooden head.

"At the end of a few hours, a whistling noise will be heard, which announces that the tumultuary fermention is begun. Then the juice begins to occupy a greater space, and rises to the top. Lift up your cover from time to time; and whenever you perceive that the vinous mass begins to sink, draw off your wine into smaller casks, which you must put immediately into a cellar, to guard them from the too great heat of the weather.

"Leave the casks unbunged for a few days; and in proportion as they throw out their yeast, fill them up carefully with a portion of the same wine, which you must have in reserve for that purpose.

"When the tumultuary fermentation in the casks begins to diminish, stop them slightly with their bungs, but take care always to fill them up once at least every day. When the fermentation is no longer perceived, bung them close, without any vent.

"This wine should be suffered to remain two months on its *lees*, after which it may be racked; and it will be found to be a good vinous liquor, *slightly acidulous*, but not approaching in the least degree to what we would term *sour;* it will be true *currant wine*, and will have preserved all its perfume."

Such is Rozier's receipt, and his management to a certain extent is good; but I am decidedly of opinion, that wines made from the fruit of this country will not keep, neither be good, unless sugar is used in making them. There is in our fruits a deficiency of sugar, and this deficiency prevents our *must* attaining the necessary gravity, without which we can have little spirit generated; and if our wine be devoid of this necessary ingredient, spirit, which Rozier asserts to be the soul of all wine, it will be poor indeed. His gravity, when he used pure juice alone, could never be above 60, and when he put water to it, it would be under 50, about the gravity of table ale. Nothing worthy of the name of wine could be produced from a gravity so low as this.

As I have before noticed, I was once of his opinion and acted upon it; but the results were disappointment and failure. I have quoted his receipt, and recorded my own experience as a warning to others.

It is not the quantity of sugar with which we make up our *must* that causes the wine to be so disagreeably sweet and unwholesome; it is when the *must* has not been judiciously attenuated.

WINE FROM MIXED FRUITS.

This method of making a wine from mixed fruits, is taken from the Correspondence of the "Bath and West-of-England Agricultural Society."

"Take black, red, and white currants, ripe cherries (Blackhearts are the best,) and raspberries, of each an equal, or nearly an equal quantity; if the black currants be the most abundant, so much the better. To four pounds of the mixed fruit, well bruised, put one wine gallon of clear soft water: steep three days and nights in open vessels, frequently stirring up the mass, then strain through a hair seive. The remaining pulp press to dryness. Put both liquors together, and to each gallon of the whole put three pounds of good, rich, moist sugar, of a bright yellow appearance. Let the whole stand again three days and nights, frequently stirring up as before, after skimming off the top. Then turn it into casks; and let it remain, full and purging at the bung-hole, about two weeks. Lastly, to every three gallons put one quart of good brandy, and bung close. If it does not soon drop fine, a steeping of isinglass may be introduced, and stirred into the liquid, in the proportion of about half an ounce to nine gallons.

"N.B.—Gooseberries, especially the largest, rich flavoured, may be used in the mixture to great advantage. But it has been found the best way to prepare them separately; by more powerful bruising or pounding, so as to form the proper consistence in pulp; by putting six quarts of fruit to one gallon of water, pouring on the water at twice—the smaller quantity at night, and the larger the next morning. This process, finished as aforesaid, will make excellent wine; but this fluid, added to the former mixture, will sometimes improve the compound."

MIXED WINE.

There are many readers who may not have in their gardens a sufficiency of any one kind of fruit to spare, so as to make such a quantity of wine as would repay them for their trouble; yet who would be disposed to make that quantity, if assured that, by mixing the different fruits of their garden, the quality would not be inferior.

A wine of a very fine and delicious nature, can be made by a mixture of white, red, and black currants, strawberry, raspberry, cherries, plums, red gooseberries, and even pears. These are weighed and squeezed, when an equal weight of water as that of juice is used. If the fruit is abundant, two-thirds juice and one-third water would be better, for the more fruit there is, the more complete the fermentation will be. This is allowed to stand covered up for twenty-four hours, then pressed, and the juice strained through a sieve ; the whole measured, and the deficiency made up by pouring as much water on the refuse as is requisite. The latter is again squeezed and strained into the former quantity. A portion of the mixture should then be taken out and weighed by the saccharometer, and the gravity brought up with sugar to 120. The after treatment is the same as with regard to red currant.—(See Red Currant Wine.) We must not, however, forget to use half a pound of argol, dissolved in the manner already described, to every ten gallons of the *must*. If properly attended to, the fermentation of this wine will also be complete.

DAMSON AND RAISIN WINE.

To make a fifteen and a two gallon cask of this wine, nine gallons of damsons and 60 lbs. of raisins are required. The raisins having been previously steeped in 12 gallons of water (as if for Raisin wine), when attenuation has commenced, are pressed, and the quantity of extract ascertained.

The nine gallons of damsons are then squeezed in small quantities, say about a gallon at a time, in order that none may remain whole; then half a gallon of water is put upon each gallon of bruised fruit. The whole now being bruised, and the four gallons and a half of water added and mixed, the raisin extract is put with the pressed damsons and water, and allowed to remain for twenty-four hours ; during which time they must be well stirred twice or thrice. They are then re-squeezed, the liquor strained, and measured, and the deficiency in quantity made up, by putting as much water on this fruit as is found necessary : the quantity should not be under nineteen gallons. The gravity is taken after this, and the deficiency made up to the standard of 120 with sugar. One pound of crude tartar is to be put into this *must* in a way similar to that already described (by dissolving it in heated *must*), and cooled to 100°.

This wine ferments well, and the attenuation is not so difficult as in other domestic wines, in consequence of both the damsons and raisins being possessed of a sufficient quantity of natural leaven or yeast. The *must* is allowed to remain in the fermenting tub until the gravity has decreased to 70; if possible, to one half of the standard 120, which is 60. It is then casked, and conducted the same as Raisin wine. Great care is necessary not to break the stones of the damsons, in case of the kernels communicating their flavour to the wine. If we wish the wine to be dark in colour, the raisin extract is allowed to stand upon the damsons forty-eight hours, instead of twenty-four. This wine does not resemble in character any other domestic wines.

CHERRY WINE.

The Gean cherry makes a fine wine when ripe. To make it good, an equal portion of pure juice to that of water is necessary. The cherries should be broken carefully (that is, should be bruised), so as not to break the stones. The fruit is then to be squeezed, and to every gallon of juice, add one gallon of water. Should the fruit not be plentiful, a very good wine may be made by adding only one measure of juice to two of water; the first gallon of water to be mixed with the gallon of pure juice; the other gallon should be poured on the pressed fruit, and allowed to remain for twenty-four hours, when the mixture is to be again squeezed and strained into the former juice and water. The quantity is then to be measured, and a portion examined by the saccharometer; the deficiency of 120 gravity to be made up with sugar. For an account of the manner in which the after process is to be conducted, see Currant Wine. This wine particularly requires great age, as it is a flat, dull wine, when young; but when it has been matured in the cask and bottled, it becomes limped and sparkling.

STRAWBERRY WINE.

The same weight of water as juice is required for making this wine. The fruit, that it may be thoroughly bruised, should be squeezed in small portions, after being deprived of its stalks; the water is then added, well mixed with the fruit, and allowed to stand on it forty-eight hours; the mixture must then be pressed through a sieve into the fermenting tub, the juice and water measured, and the deficiency of quantity made up, by putting as much water upon the refuse of fruit as is necessary. The fruit must again be squeezed, and the juice strained into the former quantity. A portion should then be taken out for examination by the saccharometer, and the necessary weight of sugar put in.

If the operator wishes the wine to be high in colour, 3 lb. of beet-root should be washed, scraped, sliced, and put into the fermenting tub, and allowed to remain there until the casking. Two days before casking, 16 lbs. weight or more of strawberries must be tied up in a piece of thin muslin, and put into the fermenting tub, in order to impart to this wine a flavour of the fruit. As the process of fermentation in a great measure dissipates the flavour, the more fruit employed in this way, the higher will be the aroma of the wine. Should more fruit than 16 lbs. be used, it would be advisable to tie it up in two parcels.

Immediately before casking, the fruit in the muslin is taken from the juice, and squeezed through the sieve into the *must*. The fermentation will be complete without artificial means, provided it is carried on in a warm room. The after treatment is the same as in Red Currant Wine.—(See Red Currant Wine.) I have some of this wine twenty years old, which is considerably better than it was five years since.

MULBERRY WINE.

This wine must be made when the fruit is perfectly ripe. To every gallon of berries add the same quantity of water. Only a small portion of the berries should be bruised at a time, that they may be done more effectually. The water is then added, and allowed to remain on them for forty-eight hours, stirring them well night and morning during that time; when they are to be squeezed and strained, and the juice measured into the fermenting tub. A portion of water must then be poured to the refuse, to make up the deficiency occasioned by absorption. After this liquor has been again separated from the berries, and added to the first pressing, two quarts are to be taken out for examination by the saccharometer. The gravity must then be ascertained and recorded, and 1 lb. of tartar added to every 20 gallons of *must*, after being first dissolved in the two quarts taken out for examination. The deficiency of gravity must be made up by adding sugar ; the gravity should be 120. The after process is to be conducted in the same manner as in the case of Currant Wine.— (See Currant Wine.)

BLACKBERRY OR BRAMBLEBERRY WINE.

The blackberries must be dead ripe, and gathered in a dry day. Like the strawberries, they must be pressed through a sieve, the juice measured, and to every gallon of juice half a gallon of water is to be added ; to every ten gallons of juice and water, 1 gallon of sloes, or half a gallon sloes and half a gallon damsons, which should be mixed with 2 gallons of water, and boiled until they are quite soft. They are then pressed, the liquor strained, and half a pound of crude tartar dissolved in it ; the liquor then added to the blackberry juice and water, the whole measured, the gravity taken, and the deficiency made up with sugar. This wine, if made in any quantity, and attention paid to it, will be complete in its fermentation. The colour will be high, beautiful, and brilliantly transparent. For after management, see Red Currant Wine.

APRICOT WINE.

This wine is made by bruising the fruit when perfectly ripe, and pouring boiling water on it. Twenty-four apricots to each gallon of water, will make a tolerable wine; but it would be greatly improved if ten jargonelle pears were sliced and added to each gallon. The whole is allowed to remain for twenty-four hours, stirring it frequently in the interim; afterwards, it must be pressed, and the liquor strained into a tub for fermentation. Take out two quarts for examination, after it has been measured. Dissolve a pound of tartar in it, and then add and mix it thoroughly with the strained juice. The deficiency of gravity to the extent of 120 to be made up with loaf-sugar. This wine will need a ferment: a quarter of a pint of very fresh brewers' yeast must be added, for the purpose of producing an early fermentation.

I refer my reader to Ginger wine for the after management.—(See Ginger Wine.)

ORANGE WINE.

This is a very delicious wine, and if compounded of such ingredients as will produce a perfect fermentation (the juice of the orange having in itself little natural leaven), it will rank as a home-made wine of the first class. In order to acccomplish this, the basis of orange wine must be extract of raisins. The following is the formula for making a 15 gallon cask and a 2 gallon cask. Forty pounds of raisins are stalked, and 12 gallons of water put on them. The stalks are to be washed with 2 gallons of water additional, which is to be strained into the tub containing the raisins and water. The steeping process is the same as in that of Raisin Wine. (See Raisin Wine.) When fermentation has extracted all that is valuable for wine-making, the raisins are pressed, the liquor strained into a sufficiently large tub to hold double the quantity, the refuse washed with a gallon of water, again pressed, and this liquor strained on to the former quantity. One-half chest of oranges is generally employed for this quantity. Each orange is cut in two, and the juice squeezed into a vessel. By using a machine called a lemon squeezer, this will be greatly facilitated.

The orange juice is then strained into the raisin extract, the whole measured, a portion taken out for examination by the saccharometer, and 1 lb. of the white argol, that is tartar from White wine, thoroughly dissolved in two quarts of the extract, and then well mixed into the fermenting mass; the deficiency of gravity made up with lump-sugar, the standard being as usual 120. Should the quantity of liquor or *must* be found too small after measuring, the deficiency is made up by throwing over the orange skins the required quantity of water, heated to 170 degrees. When cooled down to 90° they are pressed, and the liquor strained into the *must*. To ensure an early and consistent fermentation, one-half pint of good brewers' yeast is added, and the whole thoroughly mixed, the fermenting vessel well covered up, and placed in a warm room. It is necessary to keep up an artificial warmth, because this wine is made early in spring, when the weather is cold, and ungenial to fermentation. The following morning the *must* is well agitated, a portion examined by the saccharometer, and noted. If fermentation appears languid, an additional quarter of a pint of yeast must be used. The after treatment is the same as in Raisin Wine.—(See Raisin Wine.)

SECOND METHOD TO MAKE ORANGE WINE.

To every 3 lbs. of sun raisins 1 gallon of water is used, in which they are to be steeped. When the water is put on the raisins, they are broken with a bruiser, as in the former instance, and allowed to remain in the water until fermentation has deprived them of substance. As there is no sweet hanging about the stalks of sun raisins, they may be thrown away without being steeped or washed. The raisins will imbibe one gallon of water, and for this there must be an allowance made, by washing the refuse with this quantity of water; and after again pressing and straining the liquor, adding it to the former. Six oranges to each gallon of water are employed for making this wine. The oranges are pressed, and the juice, as formerly, added to the raisin extract, the gravity then tried, and the deficiency made up with lump-sugar to the standard of 120; and half a lb. white argol, as before, mixed in. The general principles for fermenting, casking, racking, bottling, &c, are the same as those of Raisin Wine.—(See Raisin Wine.)

QUINCE WINE.

This wine is made when the quinces are fully ripe. When gathered they are thoroughly wiped; or if the operator chooses to take the trouble of peeling them, this will deprive the liquor of much rank flavour which the skins communicate to it. The quinces are sliced longways to keep the cores out, and weighed, to ascertain what water is necessary to be employed; as the same weight of water as fruit is used. The water is heated to 190°, and poured upon the fruit; which is then bruised in small portions, to ensure its being thoroughly done, and well mixed with the water. It is then covered up, and the next morning the whole mass is thoroughly agitated, and allowed again to remain until the following morning, when the fruit is pressed and the liquor strained into the fermenting tub, and measured; the deficiency of quantity is made up by throwing water, warmed to 190° upon the refuse; this liquor is strained and added to the former. A portion is now weighed by the saccharometer, and the deficiency made up by bringing the *must* up to

120 with raw sugar. Should fermentation appear at first languid, one-fourth of an English pint of yeast is used. The after mode of management is the same as that of Ginger Wine. —(See Ginger Wine.) The longer this wine is kept in the wood the better it will be.

TO MAKE AN EXCELLENT WINE FROM APPLES, PEARS, AND RAISINS.

To make 15 gallons of wine and 2 gallons in a small cask, there will be required at least 250 lbs. of apples and pears, in equal proportions. The fruit ought to be used when it has arrived at a state of maturity.

Cut them into slices, and bruise them in the best possible manner, in a similar way to gooseberries.—(See Gooseberry Champagne.) When bruised, press the juice from the *marc* (the quantity from this weight of fruit should be from 18 to 20 gallons,) then strain it through a fine sieve and put it into the copper, bring-it up by a slow fire to the heat of 120° to 140°, but not exceeding this, and keep at this temperature in the copper for 30 minutes. During this operation the liquor must be skimmed several times. When taken from the copper, measure it into a fermenting vessel, and take the gravity, which will most probably be 56 to 60: what is required to bring it to the standard gravity of 120, is made up with Malaga raisins, in the same way as raisin wine is made, using the juice of the apples and pears as water. On referring to the scale of gravities, you will see that one lb. of such raisins added to a gallon of water, and allowed to remain infused until fermentation has extracted all that is valuable and profitable in the raisin, will give a gravity of 15 to 18. Allowing the gravity of the apple juice to be 60, this would bring it up to 78, which is still a deficiency of 42; consequently $2\frac{1}{2}$ lbs. raisins will be required, making in all $3\frac{1}{2}$ lbs. raisins to each gallon of juice. If the operator wishes this wine to be a dry wine, similar means are used as in the Dry Raisin wine; if a sweet wine, such means as in the Sweet Raisin wine are employed.

N.B.—The apple juice is put on the raisins at temperature 90°, and the deficiency made up with water put on the pressed raisins to the extent, and again squeezed.

As raisins rarely give a gravity of 18, it would be advisable to use $4\frac{1}{2}$ lbs. to each gallon, instead of $3\frac{1}{2}$ lbs. as stated above.

GINGER WINE FROM EXTRACT OF MALT.

What is called Ginger wine has, of late years, come into very general use. The term is, however, misapplied. That which usually goes by this name is a mere compound of water, spirits, fruits, and spices; for no liquor ought to be called wine that is not really fermented; and fermentation is never even attempted in forming this mixture, which is in fact nothing else than very strong, rich punch.

It is my intention to lay before the reader general principles, whereby he may be enabled to make a good, wholesome, cheap, and transparent wine, and not cordial. I trust he will at least give a fair trial to the process I shall lay down for making what is really Ginger wine, although he finds so very small a portion of spirit used, instead of one-third or one-half, which is the proportion used by the generality of wine-makers.

I had a conversation lately with a person who makes and sells a great quantity of this unfermented compound, or punch, known by the name of Ginger Cordial. I asked him how much spirit he generally used to the gallon? He replied that he was in the habit of putting two bottles of whisky in each gallon; but as he found complaints made by his customers of its want of strength, he was obliged to increase the dose. One remark may be made here, that in consequence of the compound not undergoing fermentation, no spirit can be generated from the sugar employed, and only the added spirit is held in solution. This proportion is enormous; for when it is half, any one drinking two glasses of this cordial, has literally swallowed one glass of whisky.

I have two ways of making this wine: one from malt, sugar, ginger, and tartar; the other from sugar, ginger, and tartar, without malt. As I consider the former the better, I shall treat of it fully. The latter can be made in the same way, by bringing up the gravity with sugar alone, instead of with sugar and malt.

I commence this process exactly in the same way as in brewing ale; and for making a kilderkin, and a two-gallon cask, (of the dimensions referred to, when treating of Champagne,) there will be required two bushels of the very best pale malt, and thirty-five pounds of good Mauritius sugar, which is thus accounted for:—One bushel of malt is as valuable to the wine-maker as twenty pounds of sugar; consequently, two bushels will be equal to forty pounds. Each pound of the sugar in one gallon of water, or *must*, will give a gravity averaging about thirty-five. Our standard gravity for the wine is as nearly as may be, one hundred and twenty. Now, were we to form our gravity by sugar alone, we would require seventy pounds, equal to three pounds and one-half per gallon; but as we have two bushels of malt, equal, in value, to forty pounds of sugar, or to two pounds of sugar per gallon, we only require thirty pounds of sugar, equal to one pound and one-half per gallon, and the following table will elucidate this.

In each gallon,

1 lb.	Sugar,	(Malt,) giving a gravity of		35
1 lb.	do.	(do.)	do.	35
1 lb.	do.	(Sugar,)	do.	35
½ lb.	do.	(do.)	do.	17½
				122½

When I speak of gallons in any of the wines and other liquors, I invariably mean imperial measure. The mash-tub, as I shall now call it, because it is fitted up as such (and I will afterwards describe it in this treatise, under the head of Brewing Utensils), is placed as if for brewing, elevated so high as to allow the extract to run off from the malt into a shallow vessel sufficient to hold from 30 to 40 gallons. The water must be boiling, and put into the mash-tub to the extent of 26 gallons. Four gallons of cold water, more or less, will be required to reduce the water from 212 degrees of heat to 182 by the thermometer, at which degree the malt is put into the mash-tub containing the heated liquor, which should guage about 30 gallons, which is first and immediately thoroughly agitated until every lump is broken, and the whole mashed into an equal consistency. This operation of mashing occupies at least ten minutes. When this is done, it is covered up and allowed to remain undisturbed for two hours. The copper is in the meantime partly refilled with water, which is first to be boiled, and then reduced by the addition of cold water to 180°; or if the weather is cold, to 190°. The water in the copper after having been reduced 190° or 186° is ready for the purpose of a second infusion, which should take place immediately after the first malt extract is drawn off. This malt extract or wort (the first) is then drawn off from the mash-tub into the shallow vessel under it, great care being taken not to allow the wort to run in too great a volume at first. This is easily done by the cock being only a quarter turned. Were it turned to the full extent, the pressure would be so great as to bring with it a portion of the grains and sediment, and render the whole extract thick, whereas it ought to be beautifully transparent. Even when the cock is only one quarter turned, it is absolutely necessary to receive the first running in a pail, until the liquor is seen to be perfectly clear, when the pail is removed. The contents of the pail may be returned immediately into the mash-tub; the volume of the wort can now be increased. When three-fourths of the wort is drawn off from the mash, it is sufficient for the present, and the cock is turned. Eight gallons of the second boiling, now reduced in heat to 190°, are spread upon the mash by means of a hand-bowl, in order that the surface may be completely wetted with this water. This is allowed to remain covered up for ten minutes.

This cock or tap is turned in a similar way as before, and about eight gallons of the wort run into the former, in the shallow vessel. The tap is again turned, as all the extract necessary for the wine has been drawn off, which should not be less than 26 gallons.

The water in the copper has again got heated, and is reduced by cold water to 190°, twenty gallons of which are thrown on the grains as formerly, and thoroughly mashed, and covered closely up. This second mashing will make 15 gallons of good table ale, such as grocers sell at 2s. or 2s. 6d. per dozen. How this is to be obtained, I shall afterwards notice, and in the meantime proceed with the wine.

The copper being empty, the malt extract or wort is put into it to boil—the quantity having been measured, and the gravity ascertained and noted, for the purpose of proportioning the sugar. The standard for this *must* being likewise 120, the necessary quantity of sugar is put into the copper with the wort. Before boiling, and after it has boiled, it is skimmed. It is then allowed to boil for thirty minutes, the ginger having been added immediately after the wort has been skimmed. This compound, in consequence of boiling thirty minutes, losses in bulk from 10 to 12 per cent. (the less or greater per cent. as it boils, slowly or quickly,) but increases proportionably in gravity. The whole is then drawn from the copper, and strained through a sieve into a vessel to ferment.

One pound of argol is put into two quarts of the wort and treated in the manner already described. This acid, however, is almost insoluable ; at least, after the greatest pains have been taken, a considerable portion will still remain undissolved. As noticed in the raisin wine, since the publication of the second edition of this work, I have generally substituted tartaric acid for argol and for the reasons assigned there. When it is reduced in heat to 85°, nearly an English pint of good brewers' yeast is added. It may be useful to know however, that half a pint of good stiff yeast from some brewers is equal to one pint from others. Therefore, the operator must be guided by the consistency. If it is thin, rather more will be required, if thick, less. At this period the quantity is measured, the gravity taken and noted, increased with sugar, or decreased with warm water at the temperature of about 90°, as occasion may require. The mixture of *must*, argol, and yeast, is now broken into the whole mass, and well agitated at the temperature of 85°. The fermenting tub is closely covered, and kept in a warm room. The next morning, upon examination, a white head will appear on the surface of the wort, which is now broken in, and the whole again well mixed. This operation is repeated every morning, until fermentation appears on the decline. The gravity is again taken and noted, and if it is reduced to 80 to 90, the casks that are to contain the wort are washed out with boiling water, and then filled with the wort while the casks are warm. The casks are to be turned a little off the perpendicular, and dishes placed under them, as before noticed in the case of Gooseberry wine, a portion being kept to fill the casks up from time to time. This operation of filling up is repeated several times a-day, for a few days. At the end of this time, a certain portion of the yeast will have fallen to the bottom in the shape of lees, and the fermentation in consequence will be languid. The lees are therefore again mixed with the wine (as it may now be called), by using a stick for this purpose. This is done twice a-week for three weeks; at the end of which time a sample is taken out, weighed by the saccharometer, and noted. All possible care is now taken, and means are used to encourage fermentation, by rousing it with a stick when it appears languid, and afterwards filling up the casks.

I have found that Ginger wine thus made will gradually ferment for nine or ten weeks, and by this time will have attenuated 70 to 80 of the original, and standard gravity 120. The best time for making this wine is the month of March or April, when the warmth of the weather will assist to ensure a consistent fermentation. The bungs are not placed tightly in, until all appearance of fermentation has entirely ceased; and this will likely not be the case for three or four months. In the following spring this wine requires to be racked, and treated in exactly the same manner as the wines already noticed, only with this difference, that a gallon of good British brandy is to be added to it, and the whole thoroughly mixed. It is then fined and bunged down as other wines, and in three or four weeks, if found perfecly clear, it may be bottled. I have found it beneficial, at the time of racking, to return the fine wine into two five gallon casks and a nine, instead of into the eighteen gallon cask; and afterwards bottling off one as occasion may require. I have some wine made in this manner nearly seventeen years old, and no one could tell it from Malaga wine, did the flavour of the ginger not betray it. It is a rich, full, delicious wine; and this flavour of the ginger, which prevents it being passed off for Malaga, were I so inclined, is to the generality of people an improvement, while the ginger itself adds to the wholesomeness of the wine.

It is generally known that all wines made from infusions of sugar, or malt, or both, are less susceptible of fermentation than those made from the saccharine of raisins or other fruits, and always require an auxiliary. Good brewers' yeast is generally employed. It certainly cannot be so good for a ferment as the yeast or lees from a good wine, and I think, besides, it has got a worse name than it deserves, providing it is quite fresh, and derived from good strong ale. There can be no doubt that the quality of the ferment is influenced by that of the liquor from which it is taken; hence the necessity of procuring it from a good material. There can be no objection in employing it in this wine as a ferment, when the extract of malt forms the body of the wine.

I now return to the second mashing, which is to be made into table ale. The whole is run off from the mash-tub, in the same manner as the former for the wine, into the shallow vessel under it, and put into the copper to be boiled, with 1 lb. of the very best East Kent hops; but if the beer is desired to be bitter, 1½ lb. will not be too much, especially if to be kept any time, and made in the spring of the year. The wort and hops are boiled one hour, and then strained through a sieve into a tub for fermentation. When it comes down to 80 degrees of heat, an English pint of good brewers' yeast is well mixed up with it. It is allowed to remain in the fermenting tub twenty-four hours, and then casked, a portion kept out to fill it up every two hours for the first day, and two or three times a-day afterwards, until fermentation appears to have subsided, which will not be the case for four or five days, when, after making a spile-hole, and keeping out the spile for a few days, it may be bunged tightly down, and in a fortnight or three weeks bottled.

The addition of half a pound of sugar to each gallon of wort will improve the beer; but this is entirely optional. If the sugar is used it must be boiled with the hops.

GINGER WINE.

The second method of making Ginger wine is to bring up the gravity to 120 to 125, by syrup composed of sugar and water, instead of malt extract (*wort*) and sugar.

The following is the formula. To make a kilderkin and a two gallon cask as in the former wines. I have already had occasion to notice what gravity one pound of sugar dissolved in one gallon of water will give, the average being for good sugar about thirty-five,—call it thirty-five—consequently three pounds and a half of sugar in one gallon of water will give a gravity of one hundred and twenty-two and a half. To make twenty gallons and at the gravity say one hundred and twenty-two and a half, seventy pounds of sugar will be required, and added to this, two pounds and a half of good Jamaica Ginger, bruised but not too fine. Presuming that the maker has got a copper that will boil from thirty to thirty-five gallons; twenty-six gallons of water are to be put into it, and immediately after, the seventy pounds of sugar. This syrup when coming to the boil, and boiling, is to be well skimmed, after which the two pounds and a half of bruised ginger are to be added, and the whole boiled together for three hours, when it is to be removed from the copper and strained through a sieve into tubs, or coolers; the copper fire however having previously been completely damped down.

The maker will find, in now measuring his extract, that instead of there being twenty-six gallons—the quantity of water he put into the copper—there will be only about eighteen or twenty, and this quantity will still be less when reduced by evaporation to the cooling point for fermentation; so that actually instead of getting eighteen or twenty gallons, he will scarcely get seventeen to eighteen, which will be at least three to four gallons short of the quantity required. In order to make up this deficiency say four gallons—eight gallons of water having previously been put into the copper—and this must be done immediately after the extract has been run off, to prevent burning the copper—the strained ginger in the seive is to be returned into it with the peel of about a dozen of lemons, and of one dozen of bitter oranges, and all to be boiled together for an hour and a half. This second boiling is to be taken out of the copper and treated in the same manner as the former, and when both are cooled down, averaging 90°, they are to be put together, (the measure of it should be twenty-one gallons) into the fermenting cask, and when the whole is thoroughly mixed together, the gravity is to be taken. Should there be a deficiency in the gravity, it is to be made up by adding a small portion of sugar to the extract, the quantity necessary for raising the gravity to one hundred and twenty-two and a half will be easily ascertained by referring to the table given in "Ginger Wine made from malt extract." Two quarts are to be taken from the fermenting tun, and one pound and a half of white argol mixed up and dissolved. Latterly, instead of using this pound and half of white argol, I have used two-thirds of a gallon of lemon juice, which is preferable to argol, particularly for this wine, as it imparts to it a fine flavour, and overcomes to a certain extent the bitter taste which yeast is very apt to give. In this case I warm two quarts of the extract to about the temperature of 90°, and mix it with an Imperial pint of good strong beer yeast. The two quarts of extract with the yeast are thoroughly mixed, and put before the fire until the mass has expanded to nearly one-half more in bulk. The temperature of the extract in the fermenting tun is taken, which should be about 80°, the yeast mixture is then to be added, as also the three parts of a gallon of lemon juice, and the whole well incorporated. The fermenting tun should be situated in a room, the temperature of which ought not to be lower than 56°, and should now be covered up. The following morning, the extract in the fermenting tun is to be thoroughly mixed, and this operation is to be repeated night and morning, until the gravity has been reduced from one hundred and twenty-two and a half, to about eighty-five. During this period the gravity of the extract is to be ascertained once a day after the operation of stirring, and the result recorded for future guidance. When the *must* or extract has attenuated to that degree, namely, about 83, should the fermentation have become languid, and the heat of the extract or *must* fallen ; it will be advisable to take out two gallons, and treat them in a similar way to the former, with this exception, that instead of breaking in one pint of strong beer yeast, only one half pint is to be broken in ; and when this yeasty extract has been expanded as before, it is to be returned to the fermenting tun, and the whole again well incorporated.

The casks intended to contain the *must* or extract are to be washed out with boiling water, and filled from the fermenting tun while they are warm. These casks are to be raised on a stand sufficiently high to admit of a tub being put under each, at the time of racking; a dish should be placed and kept continually under each, to receive the scum which fermentation throws out during its progress. In this case, as in every other, the casks are so placed off the perpendicular, as to allow the yeast to separate itself freely from the *must*, and find on one side of each cask an easy descent. Great attention is required that the casks may be filled three hours for the first twenty-four hours, and subsequently as occasion may require. Before each time of filling up during the twenty-four hours, the lees may be roused up with a stick in order that they may be incorporated thoroughly with the *must*; for, notwithstanding that fermentation will throw the yeast up to the top of the cask, a certain portion of it will fall to the bottom and mix with the lees. By this operation of stirring, languid fermentation is again partially invigorated. Should this rousing fail to have the desired effect, it will be necessary to draw two or three quarts from the cask into a vessel, and heat the *must* to about 86°; instead however of putting more brewer's yeast into this portion, the contents of the dishes placed under the casks are to be mixed up with it, and this when it has expanded, is again to be returned to the casks, and the whole well roused up.

If the casks are placed in a warm room, the wine will ferment eight or nine weeks, more or less. Every care is necessary to encourage fermentation. During this period it is advisable to stir it up once a week. When visible signs of fermentation have subsided, a portion is taken out for examination: the casks may then be bunged down; previously to which a spile-hole is made about an inch and a half from the bunghole, and the spile left out for a few days. This wine is generally made in February; and in the February following it is racked off from its lees, the casks being thoroughly washed with cold water, and slightly sulphured; for the method of performing which, see Sulphuring of Casks. Two bottles of rectified spirit are put into the casks, and rolled that every part of the inside may be wetted by the spirit which is left in. The fine of the wine is replaced in the large cask, and the deficiency by loss of lees, &c. made up by the fine from the small one, after adding one gallon of British Brandy. The lees are then put into the small cask, one English pint of finings put into the large cask, and well incorporated; the cask is then to be well bunged down, the spile kept out for a few days, and then firmly fixed. The keeping of this wine in the wood for two years is of great advantage to it. It may, however, be bottled in a year and a half. It is highly advantageous to rack it off into two ten-gallon casks; the first to remain in the cask until required, and the last that was run off, bottled in about a week;—the two casks having been fined at the time of racking, and the deficiency made up by the fine of the two-gallon cask, this last being again filled up with the lees of the kilderkin. This will give a very wholesome, cheap beverage. N.B.—When the casks are racked off, the greatest care is necessary not to suffer any of the thick to run into the fine; and to prevent the necessity of tilting the casks at this operation, they should be placed at first a little higher behind than before.

GREEN GINGER WINE.

The Ginger root in the green state has, within the last few years, been one of the importations from the West Indies; but what was the inducement for this novel importation is not apparent, unless it was that it might be made a preserve. More probably, however, it was a mere speculation, in the hope, that on its arrival here, some way of using it to advantage would be discovered. In this hope, the speculators appear to have been disappointed, seeing that, for a considerable time after the first lot was brought over, they found it unsaleable. Samples were sent to one or two of the largest establishments in London, in the British Wine Trade, under the impression that it might be found very suitable for the making of Ginger wine, and I have it from good authority, that one of these houses, finding it to be an article likely to become available for that purpose, bought the whole in the market. The wine that was manufactured from this new material, soon found its way into the country trade, when one person, more sanguine than the others, thought some benefit might accrue from puffing it as a new article, under the name of Green Ginger wine; and from that time, *Green Ginger Wine* has, I am led to believe, been advertised in every newspaper in Britain.

Having so far noticed the introduction of a new article—*Green* Ginger—for the fabrication of wine, let us now enquire whether for this purpose it is more applicable than the *dry* Ginger. There are various opinions on the subject, but mine decidedly is, that if the Green Ginger could be procured in this country at all times, perfectly fresh and sound, its adaptation for wine-making would be preferable, and for my own part I would use no other. It may be as well to state my reasons for this preference, but before doing so, I must beg the reader to understand, that I mean for the making of *Wine*, and not for the manufacturing of the compounds which are erroneously called wine, and sold as such.

In dry ginger, the method which is necessarily adopted for bruising it, causes such an immense quantity of sediment in the wine, that the loss occasioned by it, amounts to from five to seven and a half per cent. This sediment is produced by the pulverized ginger, the particles of which are so very fine, that they insinuate themselves through the sieve, when, after being boiled, the decoction is running from the copper. Again, in the process of drying the ginger, a great quantity of resinous matter is formed, which renders the flavour of the wine coarse, and, besides, forms a barrier to its early transparency. Thirdly, the dried ginger contains no natural ferment, this substance having been completely destroyed by the process it has undergone. Fourthly, by being dried, it has lost its fine, fruity aroma. No doubt there is an excess of moisture in the green ginger, which renders it double the weight of the dry; and, consequently, it becomes necessary to use double the quantity, to give the same pungency; yet, I consider, taking the premises into account, namely, that you can get it perfectly fresh and sound, it will be nearly one-third more profitable. The method I would recommend for the making of this wine, is as follows :—

To make this wine on a large scale, a mill, for the purpose of crushing the green ginger, would be necessary. This mill should be constructed in a similar way to an apple-mill. In fact, the ginger should undergo the same process as the apples do, after having been ground, with regard to pressure ; but, as I am not writing for the trade, but merely for amateur wine-makers, of course a mill would be quite unnecessary, and other means must be adopted.

The implements which I consider would be the best calculated for this purpose are, first, a wooden mell to bruise the ginger, similar to that used by the gold-beaters ; and, secondly, a block of wood to bruise it upon. This block should be made of hard wood, and fixed upon a solid stand, and of sufficient height, to allow the bruiser to sit while operating. The block must be about 24 inches long and 18 inches broad, with a skirting 2 inches high, along the two shorter and one of the larger sides, to prevent the ginger, while being bruised, from escaping. The remaining side requires no skirting. About 6 inches from the right hand extremity of this block, a shallow dish should be scooped out, of sufficient capacity to allow the largest piece or two of the ginger to lie in it, for bruising. On the opposite—the left-hand side,—a canal is cut, about half an inch deep, to receive the juice as it comes from grooves cut from the shallow dish. The bruiser sits opposite this shallow dish, and a vessel is placed at the end of the canal to receive the juice; but to prevent loss, and to conduct it properly into the vessel, a small piece of zinc or lead is fixed at the end of the canal, as a spout.

GREEN GINGER WINE—FIRST METHOD.

To make the same quantity of this wine, namely 20 gallons—a kilderkin and a two gallon cask—seven lbs. of Green Ginger will be required. It is to be thoroughly washed in two or three waters, in order effectually to cleanse it from all its extraneous earthy matter, and these waters ought to be of a tepid heat. When perfectly clean, the operation of bruising as already described is to take place, and the extract from the bruised ginger in the pail, for the present put inside.

Twenty gallons having been previously put into the copper, the bruised ginger is added and boiled for three or four hours, after which the liquor is strained through a sieve into a tub, and then returned into the copper to be boiled with the sugar. While this is going on, the bruised ginger is removed from the sieve into the tub from which the strained liquor has been taken, and about four gallons of water put on it, in order to obtain as much as possible of its remaining value, when it is again put through the sieve, and the strained liquor added to that in the copper.

Assuming now that we have twenty gallons of extract in the copper, it becomes necessary to ascertain what sugar will be required to bring it up to our proposed gravity 125. I would strongly recommend the very best Bengal sugar to be used for this wine, as it should be of the very palest colour; and, besides, these sugars impart a different flavour altogether to those of the West Indies. If the best Bengals are used, which give a gravity of 36 to each gallon, this wine will require three pounds and one-fourth to every gallon; and as there are twenty gallons of extract, there will be required about 65 lbs. of sugar. This quantity of sugar, namely 65 lbs. will increase the volume of the extract in the copper to the extent of one gallon for every 16 lbs; consequently instead of twenty gallons, there will be about twenty-four. The sugar is now to be put into the extract in the copper, the whole well incorporated and boiled, skimming it for about ten minutes, or until such time as it appears free of its impurities. It is then strained through a sieve into tubs for cooling, and when reduced to the temperature of about 80°, the juice from the bruised ginger which had been laid aside, is to be added, and the whole after being thorougly mixed, with from about half a pint to three quarters of the best brewers' yeast, is to be put into the fermenting tun and treated similarly to the other Ginger wine. The quantity should be about twenty-two gallons, and the gravity 120, *i.e.* 24 upon the glass instrument. If it is found not to be of so high a gravity, sugar should be added to bring it up to this; and if the quantity should be deficient, water may be added to the skimmings from the copper, and strained through a sieve on to the boiled ginger, well incorporated, again strained, and then added to the *must*, in the fermenting tun. It is now to be treated in a similar manner to the former Ginger wine and the same amount of spirit used.

GREEN GINGER WINE, SECOND METHOD.

There is another and a better, although a a more expensive and tedious way of making this wine.

For the same quantity as in the former wine, viz. twenty gallons, 56 lbs. of the best Valentia or Malaga raisins, (these latter are sold in mats weighing 56 lbs. each) are to be stripped from their stalks, and twelve gallons of water at about 100° put on them, the treatment of this part of the process being exactly the same as for Raisin Wine. (See Raisin Wine.) From this infusion ten gallons of *must* may be obtained, giving a gravity for this ten, of about eighty-four. When the raisins have been squeezed and the liquor strained from them, fourteen gallons of water are put into the copper with 45 lbs. of the best Bengal sugar. This is to be well mixed, and boiled until the impurities have been removed by skimming, when the ginger is then to be added and boiled for three hours; and when it is strained into tubs and cooled down to 80°, the raisin infusion and the juice of the bruised green ginger are to be added to it, when the whole should measure about twenty-one gallons, and the gravity should be about 125, *i. e.* 25, upon the glass saccharometer. It is then to be put into the fermenting tub, and treated in the same way as the former Green Ginger Wine.

As there is still much saccharum in the raisins, and a little hanging about the bruised ginger, a six gallon cask of wine may be made. For this purpose, eight gallons of water with eight pounds of sugar, are to be put into the copper and boiled for five or ten minutes, until the impurities have been removed, when the strained ginger is to be added, and the whole boiled for about three hours. If the operator wishes the wine to be more aromatic, another pound or two of the bruised green ginger, along with its juice, may be added.

When the extract is drawn from the copper and strained, and when the temperature is reduced to 100° or 120°, it is to be put into the infusion cask, and the squeezed raisins are to be thrown with it, and the whole stirred up. A portion of the cold water may be poured on the ginger which has been strained, for the purpose of depriving it of the syrup hanging about it, and when this is again strained, the liquor is to be added to that on the raisins in the infusion cask. The operation of stirring must be performed night and morning for three or four days, or until such time as rapid attenuation is apparent, when the raisins are again to be squeezed. A gallon of water may be sparged on them now to wash them thoroughly from the syrup hanging about them, and this again strained and added to the infusion cask.

There will be about six gallons and a half of this *must*, but the gravity now will only be about 80; therefore it will require about 8 lbs. of sugar to bring it up to 125. By this mode the operator will get five gallons of wine at merely the expense of 16 lbs. of sugar and $1\frac{1}{2}$lb. of green ginger. The after management the same as Ginger wine.

MADEIRA.

This wine can be very easily made by those who brew their own ale, or by those who live in towns where there are breweries, as they can procure the wort from brewers. The first part of the process is similar to that for making Raisin wine. The raisins are stripped; the stalks washed, and the water used for this purpose strained and added to that put upon the raisins. This wine requires six lbs. of the best Malaga raisins to every gallon of water, providing the ale wort which is to be used has a gravity of 90. If it is above 95, four lbs. to each gallon will suffice. The raisins should be put into a tub without the head, and treated exactly in the same manner as those used for making Raisin wine. The raisins and water are well incorporated, the former being bruised with a stick as much as possible: this operation is repeated twice or thrice a-day, a portion being taken out for examination by the saccharometer after each agitation.

The saccharometer is even more useful here than in any other of our domestic wines, for the extract yielded from this fruit is not alone by infusion, but in a great measure by fermentation. When the water is added to the fruit, and the raisins are well bruised and allowed to remain, a portion of the extract incorporates with the water; and as this extract abounds with natural leaven, it ferments spontaneously. This fermentation acts with violence upon the remaining sweet of the fruit, until it ultimately deprives it of all that is useful in wine making; but, as in the case of Raisin wine, this cannot be effected by a single infusion—a second is here also necessary.

After the glass saccharometer has indicated a decrease of from one to two degrees, the fruit is pressed and the liquor then strained. The remaining portion of water being put upon the fruit, after being allowed to remain for twenty-four hours, is again strained, and added to the former in the fermenting tub. The whole of the raisin infusion is then measured (a portion weighed), an equal quantity of malt wort, at 90 gravity, is put into the copper, with one pound of sugar to each gallon of wort, and boiled for thirty minutes, carefully skimming it before and after it comes to the boiling point, which, when cooled down to 90°, is added to the raisin extract.

Two gallons of the malt extract are kept back and poured hot upon one pound of argol, in order to dissolve it as before noticed. When cooled down to 90°, the whole is added to the raisin extract, along with an English pint of good, fresh, stiff brewers' yeast.

Example.—To make 17 gallons of this wine, 19 gallons of *must* will be required as in the case of Raisin wine. For this purpose take 60 lbs. of Malaga raisins—the fruit to be treated in the same manner as that used in making Raisin wine. When the raisins are separated from their stalks, pour upon them 7 gallons of soft water, heated to 90°, and at the highest not exceeding 100°; stir the whole up, and bruise the fruit with a pestle made for the purpose. Perform this operation three times a-day, and examine a portion of the infusion once a-day, by the saccharometer, and note it, until you perceive that attenuation has commenced. At this period, provide 12 gallons of good ale-wort (the first running from the mash-tub), at a gravity of 90, or as near that as possible. This ale-wort must be either made by yourself, or procured from a brewery. If it is obtained from a brewery, be careful that it has not cooled down under 100° before it reaches you (as it would be injurious to fermentation in the after process). Put this wort into the copper at a degree not less than 90, and to each gallon add 1 lb. of good Jamaica sugar, *i. e.* 12 lbs. in all. Boil this compound for half an hour, carefully skimming it, both before and after it boils, in order that the feculencies may be taken off as they rise. The wort, supposing it at gravity 90, before being put into the copper, by the addition of the sugar will be raised to 126. The evaporation by boiling and cooling will lessen the quantity greatly, but proportionably increase the gravity. Bruise fine one pound and three quarters of argol, and put upon it 2 gallons of hot wort, as in other wines. Measure the remainder of the ale-wort when cooled down to 100°, and add the 2 gallons in which the argol has been dissolved. Take the gravity and note it; which will be, at least, 140, and the quantity likely about $9\frac{1}{2}$ gallons, when at 60° of heat.

Squeeze the raisins that were steeping into another vessel, and then put them into the remaining portion of water, for the purpose of extracting any good that may yet remain. If there are not 19 gallons, water must be put upon the raisins to make up that quantity, and measure the quantity of this extract, which will be about the same as the wort, 9 gallons and a half, and the gravity ought to be about 108. Conduct the after process for making this wine exactly as is done in the Raisin wine. If for a dry wine, the same as in Dry Raisin wine; if for a sweet wine, the same as in Sweet Raisin wine.

	Gravity.
9½ gallons of malt extract, and sugar,	140
9½ gallons of raisin extract,	108
	2) 248
	124
Deduct for 1 gallon of water, more or less,	4
	120

N.B.—It is likely that this wine will require a portion of yeast, when fermentation becomes languid, especially if it is intended for a dry wine. Every 10 gallons of this wine requires half a pound of argol.

MALAGA WINE.

Should the operator be successful in the management of this wine, which he may be if he devotes all that attention to it of which circumstances will allow, he will produce a wine as nearly as possible resembling the real Malaga wine, as any imitation can approach an original.

The first part of the process is exactly similar to that for making Ginger wine (see Ginger Wine), except that $2\frac{1}{2}$ bushels of pale malt are used instead of 2; and 32 gallons of water instead of 24. After drawing off 26 gallons of wort, the same quantity of water is thrown lightly on for the table beer, as in the Ginger wine, to extract the remaining substance from the malt. The first extract from the malt is then put into the copper, with as much sugar as will bring up the gravity to 120. This is boiled for thirty minutes and then drawn off, strained, and measured. When it is reduced in heat to 80°, a portion is taken, examined by the saccharometer, two pounds of argol having previously been dissolved in two quarts of the wort when about 190 degrees; a pint of good brewer's yeast is added and thoroughly mixed with the wort and tartar; and when cooled down to 70 to 75 degrees of heat, is worked in with the wort at 80°. The fermenting tub is then covered up. The next morning the head which fermentation has caused to rise is well broken in, a second examination by the instrument is again necessary, and the after management is exactly the same in this as in Ginger, and every other wine in which 19 gallons of *must* are requisite to make 17 gallons of wine; the two extra gallons being necessary to make up for the loss occasioned by fermentation, and in the filling up of the casks. This wine will not be fit for drinking for two years at the least.

MEAD.

It appears that this vinous liquor was a favourite drink in very remote ages, in all countries, especially in the northern parts of Europe; and not until agriculture was introduced by the ancient Britons, were ale and beer adopted as a substitute by the inhabitants of this island.

This is proved by the laws of Isa, King of Wessex, where ale and beer are mentioned. Pliny makes mention of this beverage, and Virgil celebrates the drink made from honey. In Africa we find, by Mungo Park and other travellers, that a vinous liquor, made from honey and barley, called Mead, is the chief beverage.

Dr. Henry, in his History of England, also informs us that "Mead (that is, honey diluted with water and fermented) was probably the only strong liquor known to its inhabitants, as it was to many other nations in the same circumstances. This continued to be a favourite beverage amongst the ancient Britons and their posterity, long after they had become acquainted with other liquors. The Mead-maker was the eleventh person in dignity in the courts of the ancient Prince of Wales, and took place of the physician. The following ancient law of that principality shows how much this liquor was esteemed by British princes: 'There are three things in the court which must be communicated to the King before they are made known to any other person: 1st, Every sentence of the judge. 2d, Every new song. 3d, Every cask of Mead.'

"This was, perhaps, the liquor which is called by Ossian the joy and strength of the shells, and with which his heroes were so much delighted.

"Mead also was an ancient and favourite drink in Ireland. It is mentioned in the seventh century, and called by the Irish *Miodh*, and *Milfion*, that is, honey-wine. It is mentioned also in the Life of St. Berach, who flourished in the seventh century; and in the Annals of Ulster under the year 1107.

"That it was a common drink in Ireland would be probable, had we no stronger evidence, from the great abundance of honey in the country; it was so abundant, indeed, as to be an article of export."

Mead wine, when properly made, and kept for two or three years in the wood, is a most delightful and wholesome wine: after the grape and raisin, it is unquestionably the best. The mode of managing it is simple; and when honey is moderate in price, which it generally is in this country, Mead may be manufactured at nearly the same cost as that of Ginger, or as that of other wines. There are various ways of making this wine. That which I consider the best I shall lay before my readers.

Two casks, one of fifteen gallons, and another of two, having been prepared, and $2\frac{1}{2}$ lbs. of honey being requisite for every gallon of water, 43 lbs. of honey are therefore necessary for making this quantity. All the impurities of the honey are extracted by mixing with it at first eleven gallons of water: six whites of eggs are mixed with a portion of this water, and the honey is added to the remainder of the water. This compound is then put into the copper, a brisk and clear fire being under it at first, and gradually allowed to decrease from the time the compound rises to the heat of 180° to 190°, as it is not allowed to rise to the boiling point. During the time it is on the fire it is frequently skimmed. When no more scum rises, it is run off into a fermenting tub, and when cooled down to 90° it is measured, nine additional gallons of water put into the copper to wash out what honey may remain, and when heated to 100°, added to the former in the tub. One and three quarter pounds to two and a half pounds of argol are dissolved in half a gallon of the *must* at 190°, the whole is measured, and the gravity ascertained, in order to know how much sugar is necessary to bring it up to 120, which is the standard for this wine. An English pint of stiff brewers' yeast is broken into the half gallon of *must* and crude tartar at 85°, and when it has increased its bulk one-half, mixed well in to the whole *must* at the temperature of 85°. The greatest care is necessary, in procuring the yeast, to ensure its being very fresh, sweet, and good, as the least taint in the ferment communicates a taint to the wine. The whole is covered up ; the next morning, after thorough agitation, a portion of it is taken out and weighed ; and the after management is the same as in Ginger Wine, except that, at the first racking, one-sixteenth of rectified spirits is added. Should the operator wish the colour of this wine to be pink, his object will be attained by procuring 10 lbs. of beet-root, which must be scraped, cut very thin, and put into the fermenting-tub at the time the hot compound is run off from the copper, where it may remain until casking, when the *must* will be strained from it.

Should he wish the colour to be less deep, he may strain it just before adding the yeast. This probably may be the better way. The bottling of this wine, at the very earliest, should not take place within two years.

PARSNIP WINE.

This wine is accounted by some as the best of our domestic wines, not made with the juice of fruit. It is generally made with 5 lbs. of parsnips to each gallon of water. The roots must be well washed, and then scraped and washed a second time. They are, after this, cut into slices three-fourths of an inch thick, put into the copper with the necessary quantity of water, boiled one hour and a half, and the liquor strained as clear as possible without bruising the parsnips.

It may be remarked here, that the liquor will lose 25 per cent., or one-fourth in quantity, in boiling, and before it has cooled down to 90°; therefore it is necessary to use an extra weight of parsnips and water to meet this loss by evaporation. This remark is indeed applicable to all liquors that are boiled.

After straining, the liquor is measured and weighed by the saccharometer, and then the sugar added, to bring up the *must* to 120. A portion should now be taken out and 2 lbs. argol added, if the quantity made is to the extent of from seventeen to twenty gallons. The argol is pounded, thoroughly dissolved in hot *must* as before noticed, and mixed with the whole liquor. As this compound has in itself little of that nenessary ingredient, natural leaven, an artificial ferment is required. An English pint of good brewers' yeast is well mixed up with the *must*, when the heat is 80° to 85°, but in warm, close, weather, it need not exceed 80°. It is then covered up and kept in a warm room.

The following morning the head, which is caused by fermentation, is broken in, a portion of the liquor taken out, weighed, and noted. This operation is repeated every morning until the gravity is reduced to 90, or if possible to 80; when at this gravity, two quarts are taken out, warmed to the degree of 90, one-fourth of a pint of good brewers' yeast is mixed with it, and allowed to remain until it has expanded. The frothy head of the *must* is then taken off, and these two quarts of *must* and yeast broken into the whole skimmed mass; and what has been taken off, preserved in a bottle to assist the wine afterwards, should fermentation become languid. The casks are then washed out with boiling water, and the *must* put in while they are warm. Great care is necessary to encourage fermentation in making this wine. The casks are filled up very frequently for the first three days, and afterwards morning and evening. Before the filling up, the wine is roused with a stick, in order to incorporate the lees with it, should the fermentation appear languid, which is very frequently the case. If this fail in exciting or encouraging fermentation, a small portion of what is kept for filling up should be heated to the degree of 100, a half English pint of the skimmings mixed with it, a portion taken out of the cask, and this put in instead, mixing it well up. The after process is conducted in the same manner as in Ginger Wine.—(See Ginger Wine.)

RED PARSNIP WINE.

This wine is made by the same formula as the former, except that the gravity is brought up with loaf-sugar instead of raw sugar; and 10 lbs. of beet-roots are added if a high colour is desirable, or seven lbs. if not. The beet-roots are scraped, washed, and sliced like the parsnips: not boiled, however, as they are, as this would destroy the brilliancy of the colour, but put into the parsnip extract at about 80° of heat. Should the operator have a copper large enough, he may boil the beet-roots with the parsnips, as this will give him an increase of gravity, and consequently be a saving of sugar. The colour, however, will not be rosy; but this, perhaps, may be no object.

BALM WINE.

This wine is made by pouring boiling water on the leaves of balm, after they have been separated from their stalks. One bushel of leaves to eight gallons of water is employed. When the water has been poured on them, they are well mixed up and allowed to remain for twenty-four hours. They are then strained and the liquor measured and weighed by the saccharometer. The gravity of this wine need not exceed 110, which is to be made up with loaf sugar. If it is properly made, it is a remarkably soft, pleasant wine, and improves greatly by keeping. I have drunk some of this wine many years old, and I really was at a loss to give it a name.

COWSLIP WINE.

To each gallon of water, 3 lbs. of the best Malaga raisins are used. They are stripped from the stalks, which are washed in three gallons of water. This liquor is then added to that on the raisins, which are allowed to remain steeping in the water until fermentation has extracted their sweet, as already noticed.—(See Raisin Wine.) At this period the raisins are pressed, and the liquor strained through a seive into the fermenting tub. The remaining portion of water put upon the raisins as in the case of Raisin wine. This is then mixed with the larger portion of liquor, and if on being measured there is not nineteen gallons, that quantity should be made up as in the case of Raisin wine. The gravity is now taken and noted. To every gallon of raisin extract one gallon of picked cowslip flowers is added, put into the fermenting tub, and allowed to remain in the *must* until it is casked, when it is strained. Previous to putting in the cowslips, the deficiency of gravity has been made up with sugar to standard 120. The after management is the same as in Raisin wine.—(See Raisin Wine.) This wine will only require a moderate ferment, and every care must be taken to obtain the desirable attenuation. Cowslip wine improves by keeping in the wood, and if properly managed, will be both a beautiful and a delicious wine.

BIRCH WINE.

This wine can only be made at one season of the year, when the sap of the birch is rising, which happens before the leaves make their appearance. Generally speaking, this period commences in the beginning of March. The proper time can be ascertained by boring a hole in a birch tree, and putting faucets into it; if the sap is thick and coloured, the proper season has arrived; but if it is thin and clear, it is rather too soon. This wine should not be made by those who do not live in the country where birch trees are plentiful, as it is highly advisable to procure as much sap in two days as is necessary for making the wine. The sap collected the first day is immediately bottled and well corked, as it deteriorates much by exposure to the air. The mode of procuring the sap is by boring holes in the body of the tree, and putting in quills or pieces of elder, with the pith taken out of them, and placing vessels to receive the juice from the pieces of elder. If the tree is large, it may be bored in several places, and at different times in the same day. By this method, several gallons of juice may be got from a few trees.

When there is a sufficient quantity of juice collected in the receiving vessels the second day, (if the first day's collection is not enough,) it is immediately put into the copper along with the first day's collection, and boiled as long as any scum rises. During boiling, this scum is repeatedly taken off. When perfectly free of scum, it is run into the fermenting tub; then, when cooled down to 90°, measured, a portion taken out and weighed by the saccharometer, and the gravity brought up to 125. Two quarts of the mixture are taken out and dissolved in two lbs. of argol for every twenty gallons, and an English pint of good brewers' yeast added. When cooled to 75°, this mixture of sap, argol, and yeast, is added to the whole *must.* Should the operator find, after measuring, that his proposed quantity is deficient, he must again collect as much juice as is necessary, remembering to make allowance for the loss occasioned by evaporation in the boiling, which will be at least 25 per cent. The second quantity is treated in the same manner as the first: and when cooled down to 90°, added to it in the fermenting tub. In fact, it is better to boil each day's collection, if it can be possibly accomplished, than to keep the first day's sap. The fermenting tub should be kept in a warm room, and every means used to excite and carry on a vigorous fermentation.

Before casking, the head is beat into the *must*, which should be previously weighed to ascertain the requisite attenuation. At the time of racking, the cask is sulphured, and wetted thoroughly in the interior with two bottles of spirits. The final gravity of this wine will not be under 50. The after management of it is the same as in Ginger wine.—(See Ginger Wine.)

ELDER WINE.

Different counties in England have different methods of making this wine. As in some it is in higher favour than in others, so they bestow more pains, and make consequently a superior wine. They employ the same measure of water as of picked berries. Before being mixed with the water the elderberries are slightly pressed, and allowed to remain in the juice. The following day they are put into a copper, and boiled for ten or fifteen minutes. They are then pressed and strained through a sieve; the water to be employed being put upon the refuse, in order to wash out the remaining good. They are again pressed and strained, and the liquor added to the pure juice. The whole is then measured into the copper (after examining it with the saccharometer), with as much sugar as will bring up the gravity to 120. Each gallon will require from three lbs. to three and a half pounds of sugar; three oz. of best powdered ginger, and three oz. of allspice; the whole is boiled for thirty minutes, and run off from the copper, strained and measured into a tub for fermentation. This compound is cooled down to 85 degrees; 8 oz. of crude tartar are dissolved in a portion of it as in other *musts ;* when dissolved, it is added to the compound, with about half a pint of strong stiff brewers' yeast, perfectly fresh; a sample taken, examined by the saccharometer, and the gravity noted; the whole again measured and the deficiency made up. At this period, the gravity is either increased or diminished, as they find by the saccharometer it requires. If to be increased, sugar is added; if to be diminished, warm water at the temperature of 100° is added. Either way it is well agitated and mixed up. The next day the head of the compound, which fermentation has caused to rise on the surface, is broken in with the liquor, and the whole well agitated; a sample is again taken, examined, and recorded. The whole is allowed to remain in the fermenting tub until it attenuates one-fourth of its original gravity, which reduces it to 90. In consequence of the fruit being boiled, the natural leaven or yeast is greatly impaired. This wine and others that have their fruit boiled, require more excitement by artificial means, than such as are made from fruit unboiled. When at 90, it is casked, and every means used to cause it to attenuate to 50 or 60. The cask is filled up every three hours for the first two days; after which the sediment is incorporated with the mass by agitating it with a stick. It is allowed to remain unbunged, until all visible signs of fermentation have disappeared, when it is racked, the cask washed with boiling water, and the wine returned into it when warm, the deficiency made up from the fine of the small cask, and the lees from the large cask put into the small one. This wine, as well as all home-made wines, improves in the cask ; it is therefore advisable not to bottle it for at least twelve months. With regard to the quantity of spice, it is increased or diminished as the taste of the operator dictates.

FRONTINIAC.

To each gallon of water three lbs. of sun raisins are used. They are stalked, bruised with the hand, and the necessary quantity of water put upon them; and this is allowed to remain until their substance is extracted, which the saccharometer will show. They are then squeezed, and the liquor strained into a vessel for fermentation. To every six gallons of raisin extract, half a peck of elder flowers are used. The elder flowers are collected at that time when they shake easily off the tree, which is just before they would fall off themselves. These are put into the extract of raisins after it has been measured, and the deficiency of quantity made up by pouring water over the raisin refuse. The gravity of 130 is necessary for this wine, to be brought up by lump sugar; one pound of white argol is used to nineteen gallons. One dozen of sweet oranges for every ten gallons of *must* are strained into it just before casking. This wine requires to be artificially fermented, but not to so great an extent as in those wines where raisins are not employed. A quarter of a pint of good brewers' yeast is sufficient. The flowers remain in the fermenting tub until the *must* is casked, when it is strained. The after process is the same as in Ginger wine.—(See Ginger wine.) Should the elder flowers be scarce, a quarter of a peck will suffice to every six gallons of raisin extract.

THE METHOD OF PREVENTING WINE IN THE CASK FROM DEGENERATING.

Wines made from any of our domestic fruits should all be bottled before they are reduced in gravity from 18 to 14. If, on examination, they should be found to be under that gravity, they must be fined and racked off in a week: after which one gallon of wine with sugar-candy is mixed to the extent of a quarter of a lb. to each gallon. When properly dissolved it is returned into the cask, incorporating it well. This is to prevent wine turning to the acetous fermentation; but if acidity has taken place, it will not remedy it. It is then incurable, for no art or ingenuity can restore it. Various methods to accomplish this desirable end have been adopted by the French; their wines, from their excessive weakness, being very susceptible of this disease. One of their writers asserts, that nuts roasted like coffee, and each cut into four pieces, and thrown into the cask, when burning hot, will have the desired effect, if the wine is immediately fined with the whites of eggs, and bottled four days afterwards. M. Bidet says, that if cream is added to sour wine, to the extent of a fiftieth part, it will recover it, so that it may be racked in five days. The reader who may be so unfortunate as to have wine decidedly sour may make the experiment, as the smallest chance of success is preferable to throwing it away, or using it as vinegar. Wine faithfully made after any of the receipts in this treatise, will not require a nostrum for acidity. On the contrary, the difficulty will be to reduce the gravity sufficiently.

ON ARGOL OR TARTAR.

Having recommended the use of argol or crude tartar in almost all the wines I have noticed, I now proceed to give the reader a short account of how it is produced, whence it is taken, and its analysis; assured that this will prevent any prejudice against it being entertained.

During the slow fermentation that goes on in wine, a thick crust is deposited around the inside of the cask, varying in colour according to the nature of the wine, but being generally of a brownish or reddish hue ; familiary known by the name of Argol. This crust is scraped from the inside of the cask after the wine is taken out. On examination it is found to be composed of tartaric acid, in combination with potassa, in the condition of a bi-tartrate, and with lime as a tartrate, along with extractive, colouring, and resinous matter—the proportion of these latter ingredients, in relation to the salt of potassa and of lime, depending on the nature of the wine from which it is deposited. The salt of potassa, of which the argol or tartar is chiefly composed, is, I have said, a bi-tartrate, being composed of

2 equivalents of tartaric acid	— 132
1 equivalent of potassa	— 48
1 water of crystallization	— 9
	189 — 1 equivalent of the bi-tartrate of potassa.

The other salt next in proportion is the tartrate of lime, formed of

1 equivalent of tartaric acid	— 66
1 equivalent of lime	— 28
In its dried state at 70° Ft.	94 — 1 equivalent of the tartrate of lime.

There are several advantages resulting from the use of argol or tartar. I shall just mention two of them. It communicates to the *must* an agreeable acid, by giving to it that tartar, the want of which is a fault in most of our wines. 2*dly*, As this acid holds in combination with it much of that ingredient, natural leaven (so necessary to fermentation), in which our *musts* are so defective, it is of course an auxiliary highly beneficial.

HOW TO PREPARE ELDERBERRY JUICE AND TO KEEP IT GOOD.

"When you prepare elderberry juice, let your berries be fully ripe, and all the stalks (which are very many) be clean picked from them; then, if you have a press for drawing all the juice from them, have ready four hair-cloths, somewhat broader than your press, and lay one layer above another, having a hair-cloth betwixt every layer. The fruit must be laid very thin, and pressed first a little, and then more, till your press be drawn as close as you can; then take out the berries, and press all you have in the like manner. Then take your pressed berries, and break out all the lumps, and put them into an open-headed vessel, and put upon them as much liquor as will just cover them, and let them infuse for seven or eight days; then press out the liquor, and either add it to the rest, or keep it separately for use, and put your best juice into a cask proper for it to be kept in, and put one gallon of malt spirits, not rectified, to every twenty gallons of Elderberry juice, which will effectually preserve it from becoming sour for two or three years."

THE METHOD OF GIVING A PINK TINT TO WHITE CHAMPAGNE.

Take a gallon of the juice of elderberries pressed when perfectly ripe; boil it for the space of half an hour with two ounces of cream of tartar, skimming it several times during the process of boiling; run it through a fine sieve; when cold, filter it. Two or three ounces to a 10 gallon cask of Gooseberry Champagne, will impart to it a beautiful rosy tint. If the tint is not deep enough, more may be added, according to the fancy of the operator.

Before the colouring matter is added, the wine must be deprived of its original yellow tinge, which, if allowed to remain, would impair the beauty of this colouring matter. This may be accomplished by mixing half an English pint of milk with equal quantities (*i. e.* half a pint of each) of prepared finings (see Finings) and wine. When properly incorporated, put this in the cask of wine, and mix the whole well together;

taking care, however, that the stick used for this purpose does not touch the bottom, so as to disturb the lees. Allow the wine to remain at rest for six days, and then rack it off, and use the colouring matter. Take one English pint of the wine, mix it with the whites of three eggs well beat up, put this into the cask of wine, bung it down, and in a week or ten days it will be beautifully transparent, and fit for bottling. This method may be used with any white wine that is required to have a red tinge. This colouring matter will keep for years, provided a small portion of spirit is added to it, to the extent of one-tenth.

FINING OF WINE.

Many methods are used, and different materials employed, for fining wine. Such as I have found to answer the purpose, I shall now lay before the reader, adding one or two methods from various writers.

Isinglass and milk are the ingredients generally used for purifying home wines. One ounce of the best isinglass will fine sixty or eighty gallons. I put it into a jug that will contain one quart of liquor, adding to it a pint of home-made wine. It generally dissolves in three days, if it is stirred up twice or three times a-day; if put over a fire, it will dissolve in a much shorter time. After ascertaining the quantity of wine which is to be fined, I add more wine to the isinglass, and work it up until it becomes equally mixed. An English pint of this fining, well prepared, and strained through a fine sieve, is enough for a cask of twenty gallons. Having eighty gallons to fine, I require to remove the contents from the jug to a vessel of larger dimensions, I add two quarts more of wine, mixing it well up: the whole is put into a sieve, and as much of it as possible is worked through. I then measure the quantity, and if there is not enough for what is required, take the refuse from the sieve, and mix it with as much more wine as appears necessary, breaking it again through the sieve. When the finings are put into the cask, I mix it well up with the wine, with a stick; being careful, however, not to disturb the lees by touching the bottom. I fill the cask up, if necessary, with wine of the same kind, bung it down, and in a week the wine is generally fit for bottling. Four ounces of good milk to every gallon of wine will also purify it, adding and mixing it in the same way; and besides fining, will take away any stain the wine may have acquired. Milk will only, however, answer for white wine.

In France sheep's blood is also used for this purpose. M. Julian says "he has seen it employed with success upon white wines of a yellow stain; and at the expiration of four days, it leaves the liquid perfectly white and limpid. Take it warm from the animal, and after mixing it with a bottle of wine drawn from the cask, it is fit for use. The dose is about half a pound to a cask containing one hundred and fifty bottles."

Great quantities of eggs are also used, both here and in France, for the purpose of clearing red wine—in France, in particular, in many of the towns of which millions are used annually.

The number generally employed is from three to four to a quarter of a hogshead (fifteen or sixteen gallons); the whites are only used, which are beat up in a quart of wine, and when properly amalgamated put into the cask, and similar means used as before stated. Should the wine prove obstinate to clear, it ought to be racked, and similar means resorted to.

SPRUCE BEER.

There are two kinds of this liquid, brown and white, the latter is generally used, and is preferable to the other. It is made by dissolving seven pounds of loaf sugar in four gallons and a half of hot water: when the heat has fallen to about 90°, mix in four ounces of the essence of spruce, and dissolve it perfectly by agitation. Then add half a pint of good stiff brewers' yeast, and mix it thoroughly. Fermentation will soon commence in summer, but in winter, it will require excitement by keeping the cask in a warm room. When fermentation appears languid, the liquor is to be drawn off, the cask washed, and the liquid to be returned. Soon after a new act of fermentation will commence, and when it has subsided, you may bottle it off. The bottles should be wired; and in order to get it soon ripe, it is advisible to lay them on their side until it has become brisk: then they must be set on their end, lest they should burst.

Brown spruce may be made as above, and brown sugar or treacle used instead of loaf sugar.

GINGER BEER.

Ginger Beer is a very delicious drink in a warm day. It is made as under: Four ounces of the very best Jamaica ginger, pounded small, will be required for five gallons of boiling water. The water is poured on the ginger in the boiling state, and then allowed to stand until it has decreased in heat to 80°: the liquor is then strained through a jelly bag into a tub. Six pounds of refined sugar are to be then dissolved in it, with one ounce and a half of cream of tartar, and half an ounce of citric acid. If this is made in the summer it will ferment well, by putting into the liquor half a pint of good fresh brewers' yeast at 80 degrees; but if made in the winter it will require to be kept in a warm room to excite a brisk fermentation.

As soon as fermentation has subsided, it is to be treated similarly to spruce beer; to be racked, and returned to the cask to work again for a day or two: it is then drawn off, when fine, into strong bottles, and wired.

PART II.

COMPREHENDING

THE ART OF MAKING LIQUEURS, RATAFIAS, CORDIALS, SHRUBS, AND COMPOUNDS, BY DISTILLATION AND DIGESTION.

LIQUEURS.

There are few comfortable households, in which some attempt is not made to imitate these delicious compounds. We have them of all kinds, from the far-famed LIQUEURS of the French West India islands, to the ANISE-WATER of an English cottage; and no work devoted to domestic wine-making could be considered complete, which did not contain the formula necessary for their composition. For this reason I have been induced to study such works, in English, French, and Italian, as treat of LIQUEURS and CORDIALS; and from among them I have selected what appeared to me the best receipts; to which I have added such improvements as my own experience suggested. It is no more possible in this country to make the delicately-flavoured LIQUEURS, than the PRESERVES of tropical regions; and for the same reason—the fruits either cannot be procured, or they are not in the proper condition. But the next best thing to a good original, is the imitation which the most closely resembles it; and from the receipts given, even with the comparatively limited means of our climate, by care and not grudging the necessary expense, a variety of very fine LIQUEURS may be produced. To the receipts for making them, a number of others are added, for CORDIALS, SHRUBS, and other compounds; and no pains have been spared to make this department of the treatise satisfactory and complete.

DISTILLATION.

The art of distillation is interesting and delightful; and those who have time to spare, can, at a very small expense, make various aromatic waters and spirits, as well as the choicest liqueurs; and avoid the adulteration and vile sophistications which are so notoriously practised by those who deal in them. It is not my intention to enter into the detail of distillation; for that I refer the reader to the work, "*Nouvelle Chemie du Gout et de l'Odorat*," which will guide him safely, and with perfect ease, through the various interesting stages of this art. It may be acceptable to some to be informed, that a very small alembic is necessary for this purpose, one that will hold a gallon or a gallon and a half. There are two methods of distilling, one with an open fire, and the other in a bath. The essential oil of plants must be distilled with an open fire. This is the quickest way, but it requires very great attention. To distil spirits the bath must be used. This is performed by putting the cucurbite in a pan half full of water. This way is unquestionably the best for an amateur, and by it the contents are likewise prevented from being burned.

The cucurbite is only partially filled, say two-thirds, in order that there may be sufficient room for boiling. It is then closed and secured by means of pasting all the crevices, in order that no vapour may escape: the bath is then put on a moderate fire. The worm tube must be carefully examined, and kept full of cold water, which must be drawn off when it becomes hot, and replaced with cold; another caution must be observed, not to let the contents boil too rapidly; for a very small stream, like a straw, should be kept running from the commencement of this process to the end of it. Were the fire too great, it would not only cause it to run in too large a volume, but would raise the phlegm along with the spirit, which cannot be mistaken, as it is quite white, and of a disagreeable smell. If one single drop of this phlegm were to fall into the receiver, it would thicken the whole, and impart to it a very bad flavour. Should the phlegm rise with the spirit, it must be put into the still again. The reason why I have not entered into the detail of this art is, that although interesting, it is almost unnecessary for domestic economy, as infusion will, generally speaking, answer the purpose fully as well.

TO DISTIL ROSE WATER.

The roses should be single from which the leaves are taken. They should be gathered in a dry day. The leaves when picked should be weighed ; and for every pound weight of leaves, one pound of water is to be used : the leaves are to be steeped in the water for twenty-four hours : three ounces of salt are to be strewed on the leaves. Your still must be only partially filled, say two-thirds, and there should be a little straw at the bottom of the cucurbite, to prevent the leaves sticking to it, which they are very apt to do. Should your distillation be of eight parts, the first three of them will be the best, and only worth preserving, as the rest will be greatly inferior ; but it may be mixed with other leaves for another distillation. Should you require the water stronger, you must distil over again.

By this mode you may procure every kind of aromatic water, by adding one pound of flowers or leaves to one pound of water, and letting them infuse as above. The process of distilling lemon and orange water, from the scraped peel of these fruits, is conducted in a similar manner.

KIRSCHWASSER.

This will make a fine spirit, and a very cheap one to those who have an alembic and gean trees. A cask without the head is to be procured, and nearly filled with geans, or small, wild, black cherries, picked from the stalks. The fruit is to be covered with plaster made of mortar, and allowed to remain for six or eight weeks. The fruit is then taken out and distilled: the whole may be mixed with a minute quantity of spirits of wine, or brandy, to the extent of an English pint to every ten pounds of cherries. This will be really a very fine spirit when it is mellowed with age.

SPIRIT OF PERICOT.

One pound of the kernels of apricots, one pound of peach leaves, one drachm of cinnamon, and nine pints of spirits. The kernels and leaves are to be pounded and infused for eight days; the whole will give you between four and five pints of spirits.

SPIRIT OF CLOVES.

Take six ounces of cloves ; pound them, not fine. This may or may not be done; if done, it will be stronger of the aromatic; add nine pints of proof spirits. Nearly one-half may be obtained when drawn off.

BARBADOES CREAM SPIRIT.

Take fifteen Seville oranges, nine China oranges, and eight lemons; grate their rinds; add to the raspings a quarter of an ounce of mace, a quarter of an ounce of cinnamon, and sixteen cloves. After they have been pounded, mix one English pint of water with them; then add eight pints of brandy; put the whole into the still, and draw off four pints and a half of spirits.

CREAM OF FIVE FRUITS.

Take eight pints of brandy, the peel of four lemons and five oranges, four citrons, four bergamot (kind of orange), and four Seville oranges, seven pounds of sugar, and four pints of water. Infuse for eight days the different peels in the brandy, then place them for distillation in the bath, and draw off four pints of liquor. The sugar employed must be melted in the water over the fire. The syrup is mixed with the distilled spirit, and the whole filtered.

PERFECT LOVE.

Take of brandy, six pints; peel of Seville oranges, two ounces; peel of lemon, four drachms; gilli flower, one drachm ; water, three pints; bruised sugar, five pounds : distil once, four pints of this liqueur. The sugar must be melted with the water, and when cool mixed with the rest, coloured with cochineal, and filtered.

LIQUEUR OF FOUR FLOWERS.

Take of brandy, six pints; distilled water, four pints; spirit of roses, eight ounces ; spirit of orange flower, eight ounces ; spirit of jessamine, three ounces; spirit of réséda, two ounces; of white sugar, five pounds. Rectify the brandy in the sand-bath, melting the sugar in the water; mix and filter the whole. This can be made well with rectified spirits instead of brandy, when the bath will be dispensed with.

SYRUP OF GOOSEBERRIES.

Take two pounds of gooseberries, barely ripe; one pound of fine cherries (taking the stones from them); and one pound of raspberries; press the juice into a tureen, pass it then through a sieve, and let it remain two days; pass it through again, until it is perfectly clear.

The flavour of the raspberries being very volatile, it may happen that your liqueur may be weakly impregnated with it; to remedy which, take a certain number of raspberries quite ripe, that is to say, in proportion to the quantity of well-clarified juice you may retain. Infuse them in the juice for three or four days, after which, strain them through a hair-sieve, care being taken not to bruise or break the raspberries. To every eight ounces of this juice take five ounces of bruised sugar, and put them into a mattrass placed in the sand-bath, over a moderate fire;

when the sugar is quite melted, the fire may be put out, and the vessel allowed to cool; after which the syrup may be poured into bottles.

HOME BRANDY.

The eight following receipts are extracted from the Memoirs of the Caledonian Horticultural Society, which were transmitted to that society by Mr. L. P., and were highly approved of. In a letter to the secretary of that society, he concludes: "In the spirituous mixture of my wines and liqueurs, I make use of a peculiar kind of home-distilled spirit, which I am pleased to term brandy; an account of the manufacture of which I will give you in the first place.

Mode of making Home Brandy.

"Take twenty pints of fully ripe gooseberries, and twenty pints of white or red currants; bruise and mix them with twenty pints of soft water, and two gallons of Port wine: and if you choose to make the brandy of Scotch production, instead of Port wine, make use of whisky; but the Port wine is preferable, as it gives the flavour of French brandy. Put these ingredients into an open vessel to ferment for a fortnight; then put the mixture through a press, or cloth of any kind, that will exclude the refuse; distil this liquid twice, and you will have the liquor colourless. From every twenty pints of the mixture you may draw ten pints of good brandy. I need scarcely add, that, to colour it, a little brown sugar burned may be made use of. This spirit, in the manufacture of liqueurs, I have found superior to mixing with other spirits."*

Mode of making Crème de Rose.

"Put four pounds moss-rose buds into ten pints of good spirits; let them stand for six weeks, shaking them twice every week; then squeeze the rose leaves from the spirits: put the leaves thus squeezed into six pints of water; wash them well and squeeze the liquid into the spirits: pass them through the still once, and, if it is not strong enough, put it through again: then take a preserving pan, put into it six pounds of bruised loaf sugar, two quarts of water, and the white

* A specimen of Mr. P.'s home brandy was sent to the Society September 1828, and highly approved of.

of an egg beat up to a froth; mix them thoroughly; put it over a stove fire, taking off the scum as it rises, until it becomes quite clear: then let it boil slowly, until reduced to a pretty thick shrub, taking care not to boil it so long as to colour the sugar; pass your shrub through a jelly-bag, and put it into any open earthen vessel to cool; then to every quart of shrub thus prepared, put a quart of spirit of roses, mix them well together, and if clear enough, bottle it; if not, pass it through the jelly-bag till it becomes so, and you will have Crème de Rose."

Mode of making Crème de Moka.

"Take a pound of the best Mocha coffee, ground; put it into four pints of water; let it boil in a goblet or pan over a slow fire for ten minutes, to draw out the essence; then pass it through a flannel bag; then put it into a small still, with a pint of gooseberry brandy; pass it until it becomes strong enough; make a shrub for it as for Crème de Rose; and, when cold, mix in the same proportions, and you will have Crème de Moka.

Mode of making Kirschwasser.

"Take any quantity of full ripe geans and cherries, and, in a mortar or wooden tub, bruise kernels and pulp. To every twenty pints of bruised fruit add five pints of water, and two pints of gooseberry brandy; mix them, and let it ferment for a fortnight; squeeze out the liquid, put the refuse under a press, to express the remainder, which is the best; then put the whole into a still, pass it twice, and, if it is not strong enough, again, and you will have it as good as Swiss Kirschwasser."

Mode of making Cassi.

"Take two pints of raspberries, two pints of black currants, two pints of red currants, two pints of water, and twenty pounds of brown sugar; put them into a preserving pan, without bruising; let them boil for half an hour, taking off the scum as it rises; then put it into an earthen vessel, until next day, or till cold; then add four pints of gooseberry brandy; and, after being mixed, put it into a cask or large jar for six weeks; then pass it through your jelly-bag, when you will find it clear as claret: bottle it, and in six months it will be perfect."

Mode of making Nonpareil.

"Take a full ripe pine-apple, and pare off the outside skin; bruise it in a mortar; add one and a half dozen of sharp, ripe, white, magnum-bonum plums, and one dozen of jargonelle pears, in the same state, quartered; then to every four pounds of fruit add six pounds of loaf sugar, and three English pints of water. Put the whole into a preserving pan, and boil them for three quarters of an hour, taking off the scum as it rises; then put it into a can or jar until cold, add three quarts of gooseberry brandy, and let it stand for six weeks; then pass it through your jelly-bag, and you will have the above fine liqueur."

Mode of making Admirable.

"Take the outside skin from two dozen of full ripe peaches; quarter them, and take out the stones; add to this the pulp of two dozen of ripe greengage plums, and one dozen of white magnum plums; then to every four pounds of fruit add six pounds of sugar, and two quarts of water; put the whole over a slow fire for half an hour, taking off the scum; cool it as formerly, and mix with spirits in the same proportion. The liqueur which results will be found to deserve the name of *Admirable*."

Mode of making Sublime de Variété.

"Take equal quantities of Noyau, Crême de Rose, and Admirable; mix them through a silk sieve, then bottle, and you will have an excellent Variety."

USQUEBAUGH, TWO GALLONS.

Take nutmegs, cloves, and cinnamon, rather better than a quarter of an ounce each; of the seeds of anise, caraway, and coriander, rather better than half an ounce each; liquorice root three and a quarter ounces; bruise the seeds and the spice, and put them, together with the liquorice, into the still, with two gallons and a pint of proof spirits, and four pints of water; distil with a pretty brisk fire till the feints begin to rise; but as soon as your still begins to work, fasten to the nose of the worm rather better than half an ounce of English saffron tied up in a cloth, that the liquor may run through it, and extract all its tincture; and in order to do this, you should often press the saffron with your fingers. When the operation is finished, dulcify your goods with fine sugar.

MARASCHINO.

Take one pound of Morel cherries, perfectly ripe, one pound of the gean or wild cherry, one pound of raspberries, a quarter of a pound of peach leaves, seven pints of rectified spirits, and one of water. Bruise the fruit, and put the juice into a cruise or jar; pick the stalks out of the cherries, and pound the stones with the skins, and with the peach leaves; let them infuse in the jar for fourteen days, with spirits and water; distil, and draw four pints of spirits.

INFUSION.

The art of putting into a liquid some substances which are naturally dry, and of allowing them to remain there during a time, is called infusion. Chemists divide it into two classes; they call that maceration which is made in a great quantity of cold fluid, and they give the name of infusion to that which is made more or less sweet, by the aid of heat in a fluid less abundant. The liqueur-maker knows only infusion, without any distinction. This operation is still more essential to him than distillation, since he can accomplish by it all the effects resulting from the latter. The liqueurs he obtains are always more agreeable, and less tart, and besides every thing is more equal, than that which owes its first existance to distillation. Infusion has many other advantages. It extracts the aromatic substances uniformly, and without altering them. These substances preserve by this means more resemblance to their natural state; a much less quantity is necessary to give an equal flavour; the combination of the different aromatics is made more exactly, because, not having been previously reduced into vapour, their different specific gravities offer no obstacle to their mixture. Add to this, that the spirits in which infusions are generally made, whether brandy or spirits of wine, preserve, without alteration, the good qualities which result from the artist's proper choice; so that I make no difficulty of advising every maker of liqueurs to prefer infusion to distillation, unless he wishes a colourless liqueur; for the only fault of infusion (if it can be called one) is, that it extracts from the different ingredients a colour or tint, which influences more or less sensibly the liqueur that results from it. Although infusions are generally made with spirituous liquors, yet there are some liqueurs prepared by the infusion of the ingredients in water; but these cases are so rare, and so little known, that they are scarcely worth taking notice of. Generally speaking, each kind of liqueur requires only that the ingredients be infused a longer or a shorter time. There are some infusions for which two hours are sufficient, and for others, the longest time should not exceed four days.

This short period applies only to the fabrication of Ratafias, properly so called. The infusion of fruits or pressed flowers remains much longer; of some even for several months. There are infusions which require that their substances should remain entire; in most cases, however, it is essential that they should be cut or bruised. Every infusion should be made in a jar, which should not be quite full, but which should have a cover to fit exactly. As soon as the liqueur-maker judges that the ingredients have been infused sufficient time, which will be found out by tasting them, as in this case the flavour will be vapid; it is necessary immediately to separate them, as a longer continuance would hurt the delicacy of the aroma.

Infusion is not always the first operation: there are circumstances where it takes place after the mixture of the liquor is done, as in the Ratafias. This is when the aromatics are the accessories or seasonings, whilst in liqueurs, properly so called, they are the basis. There is another mode much quicker, and perhaps more energetic: it consists in putting the aromatics bruised into the boiling syrup intended for the mixture, and allowing them to remain until it is perfectly cool. Its sharp and glutinous condition induces it to extract quickly the aromatic substances, and tends to preserve them.

RATAFIAS.

The method of composing the common liqueurs by infusion and not by distillation, is unquestionably the most ancient; although extremely simple, it possesses many advantages; the expense is seldom considerable, and the care it requires comparatively little. By attention the artist may obtain liqueurs not only passable, but delicious. Make your infusions only in stone jars; above all, take care not to use any metal vessel, for example, of copper, pewter, or even of white iron. 2d, Employ only the finest brandy or rectified spirits. 3d, It is no less important to make a good selection of the ingredients, as well as of the fruits and flowers which are to enter into your composition. Let your spices be fresh and abounding with essential oil; the grains and seed new and seasonably dried; the fruit should be very ripe, without being too much so; the flowers fragrant, always gathered in a fine season, and shortly after sunrise; in short take care that nothing tastes mouldy, for wherever this disagreeble flavour exists, it is not possible to remedy it. 4th, The time of the infusion should be from six weeks to two months.

The choice of the place is not indifferent. In summer, if possible, place your jars where they will have the influence of the sun, and in a temperate place during the winter, being careful to keep them tightly closed down to prevent evaporation. 5th, If you can employ spirits of wine well rectified instead of brandy, your liqueurs will be much finer. There are even cases where spirits of wine must be employed. When you wish to make Ratafias with fruits which give much water, should you not be careful to remedy this evil by means of a stronger spirit, they will be constantly too weak and almost without flavour. Infusions require a very great deal of attention in filtering. In the first place, in the choice of the filter see that it is not too thick, and by this means either prevent the liquor passing through altogether, or by causing it to pass through too slowly, allow the spirit to evaporate. Next, that it may not be too thin, which, by allowing it to run through too rapidly, will prevent its being clear. A cloth rather porous ought to be used for the first filtration, to keep back the grosser sediment; then one rather less porous; and, thirdly, it should pass through filtering paper until it is perfectly clear.—(See Liqueurs made with spirits.)

IMPERIAL RATAFIA.

To make two gallons.

Take two ounces of the kernels of peaches, apricots and nectarines, bruised; five ounces of bitter almonds, bruised; half a pint of the best rectified spirits of wine (Imperial measure,) in which dissolve half a drachm of compound essence of ambergris; five quarts of malt spirits, one in five; half a gallon of English Frontiniac wine, and as much rose-water as will make up the two gallons; steep the kernels and the almonds for ten days; then draw off for use. This quantity will take one pound of loaf sugar to sweeten it; one pound and a half may be employed if wanted to be sweet. It will greatly improve the look of it, if it be filtered.

RECEIPT FOR MAKING RED RATAFIA.

Take cherries and gooseberries, of each thirty pounds; mulberries, seven pounds; and raspberries, ten pounds. Pick all these fruits clean from their stalks, &c., bruise them, and let them stand twelve hours, but do not suffer them to ferment. Press out the juice, and to every pint add three ounces of sugar; when the sugar is dissolved, run it through the filtering bag, and to every five pints of liquor add four pints of clean proof-spirits, together with the same proportion of spirit drawn from the spices in the foregoing composition.

But it may not be amiss to observe here, that different persons use different quantities of spirit drawn from spices. The best method, therefore, is to imitate the flavour most generally approved, which may easily be done, by adding a greater or less proportion of the spiced spirits.

FINE RED RATAFIA.

Mash together, in a tub or pan, three pounds of black cherries, two of ripe red gooseberries, and one of raspberries; mix these with twenty-four cherry kernels, previously pounded in a mortar, with a pint of syrup; put all into a jar; stop it close, and keep it for twelve hours in a heat of about 90° of Fahrenheit's thermometer; press it through a clean napkin; let it stand twelve hours longer, and then add to each quart of the juice a pint of good brandy; next day strain it through a flannel bag till it is quite clear.

Obs.—The French liqueurs are in general very badly imitated in England, from our substituting bitter almonds for peach and apricot kernels, and common proof spirits for their fine Cognac brandy.

RATAFIA OF CHERRIES.

Juice of Morel cherries, fifteen pints; peach leaves, one pound; brandy, fourteen pints; cinnamon, three drachms; cloves, one drachm; sugar, eight pounds. Crush and strain through a sieve the pulp of your cherries, pound the stones, put them all together in a pan on the fire, and give them one boil. When cold, measure the juice; and when you have fifteen pints, add your peach leaves, cinnamon, and cloves, which must have been previously bruised in a mortar, the sugar and brandy being added. Put the whole into a jar, leave it for a month; draw it off, and bottle it.

RATAFIA OF FOUR FRUITS.

Morel cherries, eight pounds; wild cherries, six pounds; raspberries, four pounds; red currants, eight pounds; black currants, four pounds; mace, one drachm; cloves, one drachm; and four ounces of sugar to every pint of juice. Proceed in the same manner as for cherries.

RATAFIA OF ORANGES.

Take six China oranges, two pounds of sugar, four pints of brandy, and one pint of water. Peel six fine oranges; infuse the rind in the brandy, for fifteen days; melt your sugar in the pint of cold water, and strain and filter it as above.

RATAFIA OF GOOSEBERRIES.

Take two pints of the juice of gooseberries when almost ripe; cinnamon, one drachm;

bruised cloves, one drachm; bruised sugar, two pounds. The juice, with the spice and four pints of rectified spirits, is allowed to remain in a jar closely covered for one month. The sugar is then to be clarified, well mixed, and the whole filtered.

RATAFIA OF RASPBERRIES.

Take four pints of the juice of raspberries, one pint of cherry juice, eight pints of rectified spirits; sugar, four pounds. Melt the sugar in the juice of the fruit, add to it the spirit, let it stand until the liquor is perfectly clear, and then filter it.

If brandy is employed, use only three pints of the juice of the fruit.

RATAFIA OF ROSES.

Take of spirits of wine, four pints; of rose water, two pints; a drachm of cochineal; and twenty-four grains of cream of tartar. Infuse the cochineal with the cream of tartar in three pints of water, and dissolve in this cold water ten pounds of good sugar. When the syrup is formed, mix the whole with five or six ounces of good cream. Let it digest for a few days, and then strain it.

RATAFIA OF NOYAU WATER.

In the season when apricots are perfectly ripe, take a jar, and fill two-thirds of it with the kernels of this fruit, fill the rest of it up with brandy, close it tightly, and expose it to the heat of the sun for two months. When this time has expired, pass the liquor through a hair sieve in order to separate the kernels, which may then be thrown away as useless. Replace the liquor in the jar, adding six ounces of sugar to each pint (the sugar having been bruised and dissolved in water before being put into the liquor,) close the jar, and expose it for eight days more to the heat of the sun; then strain the liqueur and bottle it.

RAFATIA OF PEACHES.

Take of the juice of the peaches, four pints;

brandy, eight pints; bruised sugar, four pounds. The peaches must be of the finest flavour and ripe, but, above all, quite whole. The stones being removed, wrap the peaches up in a cloth, and press them well; rectify the brandy, and add it to the juice of the fruit, allowing it to remain for six weeks; then mix the sugar in it, and filter the ratafia. If you do not rectify the brandy, only put two pints of melted sugar to eight pints of brandy.

BADIANE.

Brandy, three pints; water, three pints; bitter almond, one pound; sugar, one pound; one lemon peel rasped; six cloves; cinnamon, one ounce. Break up the whole, put it into a jar with the lemon peel; the sugar being melted in three pints of water; infuse for a month, strain it through a flannel bag, and then filter the liqueur and bottle it.

LIQUEUR AU BOUQUET.

Take brandy, six pints; mace, one drachm;

distilled water, three pints; spirit of jessamine, six drachms; spirit of orange flower, four drachms; spirit of roses, four drachms; spirit of sweet balm, four drachms; spirit of vanilla, two drachms; white sugar bruised, five pounds. Distil in the sand-bath the brandy and the mace to draw three pints and a half of liqueur; melt the sugar in the water; when done, mix the whole together, and let it stand till clear, and then filter. Four pints of rectified spirits will do instead of brandy: the mace to steep in for four days, then to be added.

ROSSOLIS.

Musk roses or moss roses, eight ounces; picked orange flowers, five ounces; bruised cinnamon, three drachms; bruised cloves, one drachm; water, six pints; rectified spirits, three pints; spirits of jessamine, two ounces; loaf sugar bruised, six pounds. Put the first five articles into the still, and draw three pints of liqueur, in which you melt the sugar. You then are to pour over it the spirit of wine and the spirit of jessamine; colour the liqueur with cochineal, and filter it. When you have no orange flowers, add half an ounce spirit of orange flowers, mix it to the jessamine, &c.

APRICOT AND PEACH LIQUEUR.

When apricots are very abundant, a delicious liqueur may be made by taking the apricot when completely ripe. Open it, and take out the stone. Strew it over with sugar in the manner of a comfit (but only with about an ounce to the pound), to faciliate the separation of its juice. Subject it to coction over a slow fire for four successive times, and then on every four pounds of the fruit pour a pint of good white wine, and from three to four pints of brandy.

Add the wood of the nut, after having taken out the kernel. For this purpose the shell is broken, and allowed to dry during five or six days in the sun, previously to infusing the broken pieces in the wine.

At the end of a month the liquor is passed through a search or straining bag. If, when thus separated from the refuse, it be not transparent, it must be put into a vessel with a glass of good milk, and well stirred. The milk will soon curdle and fall to the bottom, and by its precipitation qualify the liqueur. This liqueur is considered one of the finest, and has the real Muscatel flavour, and is very similar to the wine of Lunel.

LIQUEUR MADE WITH SPIRITS.

One pint of spirits, one pint of water, and one pound of sugar. To render our distilled aromatic spirits fit for drinking, we must add water and sugar.

When you wish to make a few bottles of liqueurs, or factitious spirits, take a pound of fine sugar, dissolve it in a pint of cold water, and add to it a pint of spirits: mix them and let them stand for twenty-four hours, filtering them through blotting paper, which must be folded and put into a funnel in the bottle intended to receive the liqueur. The strength of the liqueur may be regulated according to taste. Dealers in compounds and cordials filter their liqueurs through a thick kind of cloth, made by hatters, in the form of a bag. The bag is to be wetted with isinglass, clarified with white wine, by moistening it with a sponge, and wetting the bag regularly all over the inside. The liqueur then passes through it very clear. All spirits being white, liqueurs are commonly coloured. The rose colours and yellow are perfectly harmless, but other colours are not so, as blue, violet, green. To make a yellow colour, infuse saffron in spirits of wine.

CREAM OF THE FLOWER OF ORANGE.

Take of rectified spirit of wine or brandy, six pints; of picked orange flowers, two pounds; of Champagne wine, six pints; of pure water, six pints; of sugar, ten pounds. Melt the sugar in the water over the fire until it is nearly boiling, then throw in the orange flowers, and, when boiled, pour it into a large-mouthed vessel. When cold, put in the spirits and the wine. After a day's infusion, filter the liquor. The cream of the flower of orange made this way is a little sharp, but kept for a short time before using it, this sharpness wears off.

TO MAKE CAPILLAIRE.

Take ten pounds of loaf, and sixteen pounds of good raw sugar, with six eggs; let them be well beat together, and then boil them in three gallons of water, skimming the syrup as long as any scum appears; then strain it through a bag, and add two penny-weight of essence of lemon.

CLARIFIED SYRUP.

Take two pounds weight of the very best refined sugar, break it into small pieces, put it into a clean stew-pan (well tinned), and with it put a pint of cold water. When the sugar is dissolved set it on a moderate fire; beat about the white of an egg, put it to the sugar before it gets warm, and stir it well together. When it boils take off the scum; keep it boiling till no scum rises, and it is perfectly clear; then run it through a clean napkin; put it into a close-topped bottle. It will keep for months.

DIRECTIONS FOR MAKING DR. KITCHENER'S EAU DOUCE.

Cut, with a very sharp knife, the yellow peel (without any of the white) of nine middling-sized lemons; put the peels into a jar that will hold a gallon; pour on them a pint of the strongest rectified spirit of wine, and shake them about; this will mix with their essential oil, and render it easy to be extracted. After remaining twelve hours, add three bottles of rum; let them steep twelve hours longer, and then strain off.

Now squeeze the lemons, which should give about three quarters of a pint of juice; pour a quart of boiling water upon the pulps, &c. of the squeezed lemons; after five minutes strain it in an earthenware barrel, with a spigot and faucet, and which holds four gallons (these are sold in Covent Garden market); then add the lemon juice, the rum, three bottles of brandy, two bottles of Madeira (or Sherry or Lisbon), and one quart of thick syrup, which is to be made in the following manner:—

Break into bits four pounds of good loaf sugar, put it into a clean stew-pan that is well tinned, with a quart of cold spring water. When the sugar is dissolved, set it over a moderate fire; beat the white of an egg, and put a quarter of it to the sugar before it gets warm, stir it well together, watch it; when it boils, take off the scum: keep it boiling till no scum rises, and its surface is perfectly clear: then run it through a clean napkin, pour it into the barrel, and stir it till thoroughly mixed; add four quarts of boiling milk; stir all again thoroughly together, and bung it down closely till it is cold; then strain it through a flannel jelly-bag till it is quite clear.

These ingredients should yield about fifteen common-sized wine bottles :—

	s.	d.	
9 lemons, . . .	1	6	
4 quarts of milk, . .	1	4	
Pint of spirit, . .	3	6	
Quart of syrup, . .	4	0	
3 bottles of brandy, . .	18	0	
3 do. rum, . . .	9	0	
2 do. wine, . .	9	0	
	15) 46	4	
	3	1	per bottle.

N.B.—The above are all, with the exception of the brandy, charged too high. It might be made well now for 2s. 6d. per bottle.

This delicious drink costs little more than 3s. a bottle, is made in two days, is ready for the mouth as soon as it is made, and will keep good for several months: but liqueurs impregnated with lemon peel, do not improve with age. As the fine zest given by the lemon peel flies off, their flavour fades.

It is a very nice thing for evening parties; and a wine glass of it, in a tumbler of water, is an extremely agreeable and refreshing beverage in warm weather.

TO MAKE MILK PUNCH—KITCHINER.

One quart of brandy or rum; one quart of water: one quart of milk; six lemons; three quarters of a pound of sugar.

Method of making.

The day before the milk punch is made, put the rinds of the lemons, pared very thin, into a gooseberry bottle, and pour a bottle of brandy or rum on them; save the juice, strain it, and put it into the bottle that the spirit was in. The next day strain off the brandy from the peel into a large bowl. Put the quart of water to them to get all the goodness of the brandy remaining, and add it to the brandy in the bowl, also the lemon juice, and the sugar, pounded. Mix it all well together, and then pour one quart of boiling milk, stirring it all the time the milk is pouring in ; cover it over with a cloth, and let it stand a few hours ; then strain it through a jelly-bag.

Let the whole quantity run through twice. By that time the curd will be fixed, and the third clearing, a smaller proportion of the liquid may be put in at a time. It must be quite transparent.

TO MAKE ONE GALLON OF CURAÇOA.

Take half a gallon of strong rectified spirits ; add to it one ounce and a quarter of the sweet oil of orange peel, shake it well up ; dissolve four pounds of the best loaf sugar in four pints of cold water ; make this into a clarified syrup.—(See Clarified Syrup.) When cold, add it to the spirit ; shake it up, and let it stand till the following day; filter it through muslin and filtering paper. This must be drawn twice or thrice, till it is quite bright.

This liqueur is a delightful cordial, and a teaspoonful in a tumbler of water is a very refreshing summer drink. If the oil of orange peel cannot be procured, ten ounces of thin-cut Seville orange peel may be substituted, that has been dried and pounded. This must be infused for fourteen days in a quart of the finest rectified spirit, and then the whole strained, which may be added to one quart of the clarified syrup.

NECTAR.

A pleasant cordial for those whose stomachs cannot bear a stronger, particularly if taken in the morning, for gently exhilarating the spirits, and strengthening the animal functions, may be advantageously made with three quarts of the imperial ratafia, six grains of cassia oil, and an equal quantity of the oil of caraway seeds, dissolved in half an ounce of spirit of wine, and made up with Orange wine to fill the gallon. Sweeten, if wanted, by adding a lump of sugar in the glass, or putting ten ounces in the gallon.

NECTAR.

Take of sugar thirteen pounds; of very clear water, thirteen pints; the whites of four eggs, beating them up with one pint of the water. Clarify the sugar: to the syrup add seven pints of rectified spirits of wine, and two pints of double orange flower water. Keep the liqueur for some time before using it.

TO MAKE TWO GALLONS OF NOYAU.

One gallon and a half of French brandy, one in five; six ounces of the best French prunes; two ounces of celery; three ounces of the kernels of apricots, nectarines, and peaches; and one ounce of bitter almonds—all gently bruised; essence of orange peel, and essence of lemon peel, of each two pennyweight, killed in the same manner as the oil of peppermint; half a pound of loaf sugar. Let the whole stand ten days or a fortnight; then draw off, and add to the clear Noyau as much rose-water as will make it up to two gallons, which will be about half a gallon.

TO MAKE TWO GALLONS OF CITRON CORDIAL.

Infuse one pound and a half of Smyrna figs, for a week, in five quarts of spirits, one in five; draw off, and add to the clear spiritous infusion essence of orange and lemon, of each one drachm, killed in half a gill of strong spirits of wine; one ounce of dried lemon, and half an ounce of orange-peel: twelve or thirteen ounces of loaf-sugar. Make up as before with fair water.

TO MAKE TWO GALLONS OF PEPPERMINT CORDIAL.

Take five imperial quarts and a pint of rectified spirits, one in five under hydrometer proof; one pound and a half of loaf-sugar; one half gill of the strongest spirit of wine; two pennyweights, troy, of the oil of pepperment; water, as much as will fill up the cask, which should be set up on end, after the whole being well roused, and a cork for drawing off placed in it.

Directions to make up the Peppermint Cordial.

Powder half an ounce of sugar in a brass mortar, on which pour the oil of pepperment, and beat it into a thin paste, stirring the sugar and oil with a knife, scraping what is in the pestle and mortar together, that the oil may be uniformly incorporated with the sugar; then add the spirit of wine, and blend them well together; have the remainder of your sugar ready dissolved in about half a gallon of the water, to be used for making up; rouse the whole well together with a stick; dissolve one drachm and a half of alum (powdered), in the water that is to make up with, boiling it over the fire; and when blood warm, add it to fill up the cask, and let it stand two or three days, in which time it will be fit for use.

TO MAKE TWO GALLONS OF ANISE-SEED CORDIAL.

Take five quarts and a pint of spirits, one in six; half a gill of strong spirit of wine (sixty-eight over proof); thirteen ounces of loaf-sugar; one drachm and a quarter of the oil of aniseed;

rather better than a drachm and a half of alum, finely powdered. Dissolve the sugar in one part of the water used for making up, and the alum in the remainder; and proceed as directed in the making up of peppermint cordial.

Aniseed cordial does not bear to be reduced much below one in five, as part of the oil will separate when too much lowered, and render it unsightly.

TO MAKE TWO GALLONS OF CARAWAY CORDIAL.

Take a drachm and a quarter of oil of caraway; two drops of cassia-lignea-oil; one drop of essence of orange-peel, and the same quantity of the essence of lemon; five quarts and a pint of spirits, one in five; thirteen ounces of loaf-sugar. Make it up, and fine it down, as directed for aniseed.

TO MAKE TWO GALLONS OF USQUEBAUGH.

Take one pound of sun raisins, stoned; five ounces of figs, sliced; cinnamon, one ounce and a half; nutmegs, three quarters of an ounce; cloves and mace, of each two drachms; six ounces and a half of liquorice; one ounce of saffron. Bruise the spices, slice the liquorice, and pull the saffron in pieces. Digest these ingredients eight days in two gallons of proof-spirit, in a vessel close topped; then filter the liquor, and add to it half a gallon of Canary wine, and one drachm of the tincture of ambergris.

TO MAKE TWO GALLONS OF CINNAMON CORDIAL.

Take two pennyweight of oil of cassia lignea, killed, as before directed, with sugar and strong spirits of wine, one gallon and a half, at one in six; cardamon seeds, husked, one ounce; orange and lemon peel dried, of each one ounce: fine with half a pint of alum water; sweeten to your palate with loaf-sugar, not exceeding two pounds, and make up a two gallon measure with the water you dissolve the sugar in.

This is a very cheap and elegant cinnamon cordial. Colour with burnt sugar.

GINGER CORDIAL.

This cordial, within these few years, has obtained such repute, that in the mansion and in the cottage it is alike to be found. From almost every wine-merchant, grocer, and spirit-dealer in Scotland, it may be purchased. Indeed, so great is the consumption of it, that hundreds of dozens are sent from Leith to London monthly.

Receipt for making ten Gallons.

Take two pounds of the best Jamacia ginger, and bruise it with a hammer, piece by piece, so that it may all be properly crushed; put it into a jar large enough to hold two gallons; pour upon it one quart of boiling water; when cold, add five quarts of rectified spirit 11 O. P., stirring the ginger well up, and cover it close down. The operation of stirring ought to be performed three or four times a-day. This mixture must infuse sixty hours, but not exceeding. If not required to be very aromatic, forty-eight will be sufficient. When this time is expired, take seventeen pounds of good Jamaica sugar, and dissolve it in two gallons water; put it into a pot and let it boil, until, by skimming, all the feculencies are removed; put it into the cask; wash the remaining syrup out of the pot in which the sugar was boiled with two gallons of water, and add it to that in the cask; strain the infusion of ginger into a pan, and when the syrup in the cask is perfectly cool, add the extract to it, with one quart of lime juice, half a gallon of the best West India shrub, half a gallon of rum, four quarts of rectified spirit, 11 O. P., and half an ounce of essence of lemon; fill the cask up with water, and fine it down with milk or isinglass finings. It ought to be fit for bottling in forty-eight hours. A quart of orange flower water will give it a fine aroma.

Obs.—If this cordial is required to be very high of the lemon flavour, add for every gallon, the peel of five lemons, to the infusion of ginger at the first. This peel must be very thin. It will be necessary to kill the essence of lemon by mixing it in a glassful of strong spirit of wine, in the same way as the oil of peppermint—(see Peppermint Cordial)—and afterwards mixing this well with four quarts of rectified spirit.

TO MAKE TWO GALLONS OF BRANDY SHRUB.

Take one gallon and one pint of the best French brandy, one in eight; lemon and orange juice, each one pint; four orange and two lemon peels; loaf sugar, two pounds; compound essence of orange and lemon peel, a small tea-spoonful; make it up with fair water, and let it stand till fine. Be careful when you are drawing it off not to shake the vessel.

TO MAKE TWO GALLONS OF RUM SHRUB.

Take one gallon of rum, at one in eight; lemon and orange juice, each one pint; one quart of orange wine, and two pounds of loaf-sugar: one orange and lemon peel: fill up your two gallon vessel with water, cork it up loosely, and let it stand until it is fine; then cork it down close, and bottle it when you choose.

CHERRY BRANDY.

This liqueur is made in different ways. Some press out the juice of the cherries, as the first operation, and then add to it as much sugar as agreeable to the taste of the operator; some like it more, and some less sweet. When the sugar is dissolved with the juice, this juice is measured, and half the quantity of brandy as juice is added. Others put two-thirds brandy, and only one-third juice. But the common method to make cherry brandy is to put the cherries, when they have been clean picked, into a small cask: the cherries should half fill it. It is then to be filled up with proof spirit, and in this state to stand eighteen to twenty days; the liquid is then drawn off into another cask: the cherries are to be taken from the cask, and pressed. When done, half the quantity of spirits to that employed before, is to be added, and allowed to remain for forty-eight hours on the pressed fruit; it is then to be strained, and this spirit to be added to that which was first drawn from the fruit. One-fourth water to that of the last spirit is to be put on the refuse, and to remain twenty-four hours, when it is to be strained. To this last liquid add half a pound of sugar for every gallon of the compound, and this liquid, with the dissolved sugar, is to be added to the former quantities, and well mixed.

It must be loosely bunged for the first two or three days, but after that, firmly bunged. It will be fit for using in a month.

TO GIVE BRITISH SPIRITS THE FLAVOUR OF FRENCH BRANDY.

Various methods have been suggested for producing this: we have tried most of them, and they are all quite useless, except the following, which certainly ameliorated the flavour of our proof spirit considerably. In a pint of proof spirit put about eight French plums; let them steep for ten days, and strain the liquor.

GREEN GAGES IN BRANDY.

Take green gages before they are quite ripe; cut off half the stem, prick them, and put them in a pan full of water, so that the water be three or four inches above the fruit; place your pan on a moderate fire, and when the water is so hot that you cannot bear your finger in it, take the pan off, and throw in a handful of salt, and a handful of spinach ; cover it with a cloth, and let it cool. The next day put the fruit on a gentle fire for two or three hours, taking care that the water does not boil ; if you have a thermometer, you may regulate the heat to two hundred degrees, which it should never exceed. When the fruit is of a perfect green, and rises on the water, put it into cold water, and finish as the peaches.

PEACHES IN BRANDY.

Choose the peaches you mean to preserve a little before they are ripe ; take off the down by wiping them with a cloth ; prick them with a small fork to the stone, and put them as you prick them into water, then on a moderate fire, keeping the water nearly boiling : when you find your fruit softened so as to give way to the finger, throw them into cold water, and leave them to stand for a quarter of an hour ; change this water for another ; and let them stand another quarter of an hour ; drain them on clean towels, and, when dry, arrange them regularly in a glass jar : have some clarified sugar boiled to the little pearl: one quarter of syrup for two-thirds of fruit is a sufficient quantity; put to them double the quantity of brandy, at thirty degrees; mix, and strain it through a flannel-bag two or three times, and place the peaches regularly in your jars, and cover them with bladders, well tied down.

CHERRIES IN BRANDY.

Take some fine Morel cherries; cut off half the stalks or stems, and put them into cold water; when well washed, drain them on a sieve and place them in your glasses; fill them with brandy at twenty-three degrees, and add to each bottle a little cinnamon, broken or slightly powdered; render the bottles completely air tight, and leave them for a month or two. After that time separate the cherries from the brandy, measure it, and add to every pint four ounces of powdered sugar; stir and melt it, and strain it two or three times through a flannel bag; when perfectly clear, put it on your cherries, to be used at pleasure.

TO MAKE SPICY SPIRIT.

One ounce and a quarter of mace, three quarters and an ounce of nutmeg, pounded, to one imperial quart of spirits.

HOW TO PREPARE COCHINEAL FOR COLOURING LIQUEURS.

Take one ounce of cochineal, pound it well, and make a soft ley with wood-ashes boiled in water; clear it through a flannel-bag; take one pint of it, let it boil up, and put in your cochineal; pound a quarter of an ounce of alum, and a quarter of an ounce of cream of tartar, and add them to the cochineal, and reduce it by boiling, till it becomes of a very dark fine red. If it is for keeping, add pulverized sugar. You may use this colour in every thing.

COOLING DRINKS.

CURRANT, RASPBERRY, AND STRAWBERRY WATERS.

Are in general made by bruising either of the above fruits, and straining the juice through a sieve, and afterwards through a jelly-bag; water is then added, with syrup to the taste; it is strained again through the bag, and served up as cold as possible. This liquor is never so transparent as when the fruit is boiled in the water for a short time.

LEMONADE.

Take the outside rinds of six lemons, cut them as fine as possible, and put them into two quarts of water; then cut your lemons in halves, squeeze the juice into the water and add syrup to your taste. Mix the ingredients well, and let them stand for some time; strain the liquor through the jelly-bag, and serve it up as cold as possible. If ice can be procured, ice it.

ORGEAT WATER.

Blanch half a pound of sweet almonds with a dozen bitter ones; pound them well, and add to them two pints of water, or more, to the taste, with sugar and orange flower water; mix them well together, and strain them; and if you have ice, it may be iced in the bottle after it has been strained.

ORANGEADE.

Is made in the same way, using the best oranges instead of lemons. These drinks are by far the most refreshing and wholesome for dances. Many other receipts are recorded in other works, but none are considered so elegant, nor can be so safely recommended, as the above.

TO PRECIPITATE THE COLOUR, ETC. FROM MOLASSES.

"It requiring age, or a length of time, to get rid of the disagreeable flavour attached to treacle or molasses, both of which are particularly injurious to made wines, vinegars, &c. &c. of a delicate taste and superior quality; after going through a course of experiments to correct, or, if possible, to remove it, I found that jelly of starch, made somewhat thinner, and more transparent than the laundresses usually prepare their starch for stiffening linen, will effectually discharge the colour of molasses, if previously diluted with three or four times its weight of liquor (*i. e.* water), in the proportion of a pound of starch made into a jelly for ten gallons of molasses and water. This mode of refining the molasses fluid reduces it to a fine and almost colourless thin syrup, and, when well managed, renders it as fit for our purpose as clayed sugar can be, when employed in the wine-making business."

PART III.

CONTAINING

A SHORT AND SIMPLIFIED TREATISE ON DOMESTIC BREWING.

BREWING.

Brewing and Wine-making are so nearly allied, that, literally speaking, making ale, is nothing more or less than making wine from malt by the process of fermentation, instead of making wine from the grape, by a similar process.

The methods which are had recourse to in producing these liquors are different, although not so much so in the first, as during the last stages of the process; for, as the brewer's principal study is to exhaust all the fermentable matter which his malt contains, so the winemaker's object is to extract all the goodness of the fruit which he employs. It is not possible for those who do not know the value of the materials they have to work upon to attain either of these ends. Even to those who do, without the aid of a saccharometer, it is impossible for them to ascertain whether they have succeeded or not. As I have therefore entered very fully into the merits of the saccharometer in a former part of this work, I must not here overlook the value which is derived from the use of the thermometer also; for, strictly speaking, the one is of little service without the aid of the other, especially in brewing.

By the thermometer we ascertain the degree of heat which is capable of penetrating into the malt and dissolving the farina, and consequently of extracting the substance. Without the use of this instrument we would not be able to regulate the heat of the water necessary for effecting this end; but by employing it once we can proceed without fear or danger of failure. Were we to use the water at too high a temperature we would lose upwards of one-fourth of all the malt that had been wetted, as it would go into a paste, in consequence of the water hardening its surface, and thereby shutting up the pores. There would, in this case, be no possibility of properly mashing the malt afterwards; and, instead of being consistently mixed, it would present to us balls, or hard lumps of impervious glutinous paste, the centres of each being composed of unwetted malt, which would remain closed up in this paste, and totally useless, If, on the other hand, we use water at too low a temperature, the farina will not be dissolved; and, besides the loss which will be experienced in the deficiency of gravity in the extract, the liquor will not be so transparent. These evils however, are not so material as that formerly mentioned, as they can, in a great measure, be remedied by using, for the second mashing, or sparging,* water of a higher temperature. Besides the indispensable necessity of using the thermometer in this first stage of the process, its value is found equally great in the more advanced stages, especially at that period when we require to know the heat of the worts necessary for fermentation. It is impossible that the eye or the finger can afford us correct information of the quantity of heat which is present. At one time the warmth of the body may be greater than at another; and, in this case, the worts may appear too cold, when in reality they are not so. At another time the accidental warmth of the finger may be less, and then the worts will appear too hot, as is the case in cold weather. The inference which we would thus draw, by judging according to the touch, would be erroneous in both these instances; and the consequences might prove fatal to our hopes of effecting a consistent fermentation. In short, to say the least of it, if we prove successful in obtaining our end, we

* For the method of applying water in this manner, see Sparging.

would be more favoured by chance than by good management.

Since the introduction of these instruments, brewing has risen to the dignity of a science. It is now no longer a merely mechanical operation, which may be performed by any illiterate person. Yet, I am sorry to observe, that there are still some so averse to any thing like innovation, that, rather than use these instruments, they will go on in their old-fashioned "rule-of-thumb" way, always producing the same quantity of wort from a given quantity of malt, whether it be good or bad; and they shut their ears to any suggestions that may be offered to their preconceived notions of the infallibility of their system.

The scientific brewer, on the other hand, knows and appreciates the value of these instruments; and to tell him to brew a certain quantity of ale from a given quantity of malt, without the aid of the thermometer and saccharometer, would be the same as to tell a captain to go to sea without his compass. Each would be at a loss how to proceed; and the issue to both, in all likelihood, would be complete failure.

If the common brewer finds these instruments so essential to the success of his operations, why should the domestic brewer despise them or overlook their value? Surely the only reason must be his not having duly considered the subject. But why, may I ask, have none of the publications on domestic brewing treated of these instruments, and recommended their use? Not one of any of the publications on this subject, which I have read, has done so. The reason I have in vain endeavoured to discover. Surely, if their value is so well appreciated by the common brewer, that without them he never attempts to brew, they ought to be recommended to the domestic brewer by those who write scientifically on the subject. Their use is as valuable to the one as to the other.

It must be owned that there are many families who are noted for the good ale which they make without the aid of either of these instruments, and who pride themselves in excelling their neighbours in producing it; but they are regardless of the expense and trouble which this practice costs them; and if, in consequence of improper management, it is not drinkable in six or eight months, they can allow it to stand for a year, and try whether, in another brewing, chance will favour them more than in this first attempt. Ask even these people most noted for good ale how often they are successful; and if they are candid, they will acknowledge that they seldom with all their trouble, expense, and judgment, produce what they wish; on the contrary, they too frequently find, that what they intended to be good ale is a thick, sour drink, unworthy of the name.

It will be my object to give the reader such information as shall enable him to brew uniformly, and without any liability to failure, a transparent ale of a superior quality, from a less portion of malt than that which is generally used by those who continue to brew without the help of the saccharometer; assuring him I shall not give him any instruction but what is plain and practicable.

The modes and methods which I will recommend I have proved by different experiments, and I doubt not but they will be found of utility to families who brew their own ale, especially to farmers, who generally superintend this part of domestic economy themselves.

Before proceeding farther, it is my intention to lay down some practical rules, to give the brewer an idea what quantity of ale and table-beer wort he ought to draw from every bushel of the best malt, and what gravity he may expect this wort will give. It is impossible, however, to convey to his mind a just conception of the way by which he may judge of the value of his malt before mashing; but as there are methods which may safely be adopted to direct him in the purchasing of it, and which are invariably used by brewers, I shall lay them before him.

Barley, when properly malted from good materials, has a full, round body, easily broken, and, when broken, presents a beautiful, soft, sweet, white flour. The grain, when put into the mouth, breaks freely, and has a sweet, mellow taste, and the skins are very thin. On the contrary, if the malt is not good, on biting it, it breaks hard and flinty. It will be much heavier than the good malt, which may be proved by putting a portion of it into a tumbler of water. The greater part of it will fall to the bottom, in the same manner as barley itself would do, before it undergoes the process of malting; whereas, if it had been well malted, it would have floated on the surface. In the very best malt some grains will be found in the middle of the water, and a few at the bottom; but these will be very few indeed, compared to those which will be found on the surface.

With respect to the value in gravity of a bushel of good malt, it will be found, by referring to the table of specific gravities, that it is equal to about twenty-four pounds of sugar:*

* Mr. Accum, in that part of his Treatise on the Art of Brewing, addressed to domestic brewers, or, in his own language, to those "brewing in a small way," states authoritively, that "12 lbs. of molasses, or 10 lbs. of muscovado sugar, are equivalent, or yield as

and that one pound of sugar, dissolved in a gallon of water, gives a gravity of thirty-six.

Good ale worts from the mash differ greatly in gravity. The Scotch brewers use their worts

much fermentable matter as is produced from one bushel of malt, of the usual quality, that is, such as is capable of yielding 65 lbs. solid fermentable matter per quarter of malt."* On this ground, Mr. Accum says, "when economy is an object, a quantity of molasses, or muscovado sugar, may be substituted for a portion of malt." Now it appears that the question, whether malt or sugar is most valuable, was considered in 1807 by a committee of the House of Commons, when it was shown, by evidence, that it would require 197 lbs. of sugar to give the same quantity of saccharine matter as is contained in a quarter of good malt of eight bushels. It was thus demonstrated that a bushel of malt, the quarter of which is capable of producing 80 lbs. of saccharine matter, is equal to 24⅝ lbs. of muscovado sugar, or upwards of 28 lbs. of molasses. But although Mr. Accum's malt (which must have been very inferior) was capable of producing only 65 lbs., it would still have been equivalent to at least 20 lbs. of sugar per bushel. The price of malt in 1807 (when these facts were decided) was 82s. per quarter, being about the same that it is at present; and it was shown that the price of sugar "*should be* from 32s. to 33s. per cwt., to induce distillers to use that article in their trade in preference to malt; at present its price is 56s. per cwt. Hence it is clear that sugar, so far from being economical, as Mr. Accum would have his readers to believe, is the very reverse.

* Mr. Accum states that malt of the usual quality only yields 65 lbs. of solid fermentable matter the quarter; whereas, by the table given in his own book, page 84, the fermentable matter in a quarter of malt ranges from sixty-five lbs. and a quarter, to eighty-six lbs,; and the average of twenty-six different kinds of malt in this table is seventy-seven lbs. per quarter, which is equivalent to about twenty-three lbs. and three-quarters of sugar the bushel.

from 55 to 125, and some even as high as 130, although now this is very rarely the case.

In England, brewers, with the exception of those at Burton, and one or two other places, make their ales from worts of a gravity considerably lower, for they rarely exceed 90, the lowest being 66, consequently they are enabled to run from one quarter of malt from two to three barrels of ale.

It is a general practice for gentlemen who brew at home, to obtain from one quarter of malt from fifty-four to sixty-four gallons of ale, and from eighteen to twenty-seven gallons of table-beer. Others make no table-beer, but mix the table-beer wort with the ale wort, and so make a hogshead and a half (eighty one gallons) of weaker ale. This makes an excellent beverage, especially if the second wort be obtained by sparges instead of by a second mashing. Either of these modes may be adopted according to the taste of the operator. The first is managed by mashing, with eight or nine gallons of water on every bushel of malt: drawing off for the first wort nearly forty gallons, the gravity of which may be about 81, and sparging four or five gallons at different times over the mash; drawing for the ale wort forty gallons from the first running, and thirty gallons from the sparges, making in all seventy gallons.

After seventy gallons of ale wort have been run off, the tap is turned, and thirty gallons of water are sparged in like manner for the table-beer, which should run at least thirty gallons. The second method is accomplished by wetting the malt with eleven gallons at first, and drawing off eight gallons for each bushel. The gravity of this running will be about 51, and the quantity sixty-four gallons. Thirty-seven gallons are then sparged at different times, in portions not less than five gallons for each sparge. From these sparges thirty-seven gallons are run off, making in the whole 101 gallons, say at a gravity of 63. As it is impossible to extract the whole of the goodness from the malt, one-eighth will at least remain in the mash after all, and a good beer may be made by again sparging with three sparges, eight gallons to each sparge, running from twenty-four to twenty-eight gallons. This last wort, boiled with the addition of a quarter of a pound of sugar to each gallon, will give a gravity of about 40. It must be remembered, that at least from 25 to 30 per cent. will be lost in quantity in the absorption by the hops after processes of boiling, cooling, and fermenting; but the gravity of the wort will be proportionably increased. Therefore, if the operator at any time find his ale wort deficient in quantity, he will make it up from the table-beer wort.

If the amateur brewer wish his ale to be very strong, his ale wort should not be under 100; but if he be only desirous of obtaining a delightful beverage, of a lively, brisk, and sparkling character, instead of a heady, glutinous, half-fermented drink, which is generally the case with ales made from high gravities, a wort of a much lower gravity must be employed.

Suppose he intends to brew from one bushel of malt, and that the value of that bushel of malt is equal to twenty-four pounds of sugar; but if the malt be very superior it will be as valuable as twenty-six; however in the present case we will assume it to be only twenty-four, by pouring upon it eight gallons of water at a proper temperature (say 182,) and mashing it to an equal consistency, were it possible to get all the goodness from it at one extraction, and the same quantity with which he mashed, *i. e.* eight gallons, he would have a gravity of 108; as twenty-four pounds of sugar dissolved in eight gallons of water are equal to three pounds to a gallon. Now, one pound of sugar dissolved in a gallon of water gives a gravity of 36, consequently, three pounds in a gallon will give three thirty-sixes, namely 108. But it is not possible to extract, at the first mashing, all the goodness of the malt, for nearly one-half of it will be found to remain in the mash. Neither is it possible to draw off the same quantity of wort as water used in mashing, for each bushel of malt will absorb about three gallons of water.*

* Professor Donovan observes (Domestic Economy, p. 203 :)—"In calculating the quantity of water necessary to produce a given quantity of a first mash, it will be of nse to know that an imperial bnsbel of ground malt, absorbs and retains abont six and four-fifths imperial gallons of water." From my own experience, which is in accordance with every other authority that I have consulted, Mr. Donovan has greatly over estimated the quantity of water which is absorbed by the malt. In no case have I found it to exceed three and a half gallons; when large quantities of water are employed, it is generally nnder three.

On this snbject I have considered whether Professor Donovan was led into this erroneous calculation by making the experiment on a small scale, when the result might have been very different from what it would have been if made on a large, or even a moderate scale; for, in either of these last instances, I was convinced that he was mistaken. Having a small mash-tnb capable of mashing half a peck, and having obtained a quarter of a peck of the best malt, which before being gronnd weighed two and a half lbs., and after being ground measured abont five pints, I poured upon it six pints of water, at a temperature 182°; and after mixing it thoroughly, I allowed it to remain undisturbed for the space of two hours and a half. I then set the tap running, and obtained abont four pints and a qnarter of wort, leaving with the mash one pint and three qnarters Now, as there are only sixteen qnarters of a peck in a bushel, and as each qnarter of a peck has been fonnd to absorb only one pint and three-qnarters, those sixteen qnarters will absorb twenty-eight pints, that is, three gallons and a half, instead of six gallons and four-fifths, as Professor Donovan maintains.

This experiment also served to confirm the inaccuracy of Mr. Accum's *economical* doctrines (see note, p. 323) regarding the advantage of using sngar instead of malt, for even on this very small

However, let us suppose one-half of the value of the malt remains in the mash, namely, twelve pounds; instead of having eight gallons of wort, at a gravity of 108, he will have only five gallons, at a gravity of about 86. The remaining 12 lbs. of sugar, the half of 24 lbs., are still as before noticed in the mash, and may be extracted by second mashing, or by *sparges* (which last operation is far preferable to the former,) with four gallons of water, at four sparges, and drawing off a gallon at each sparge for the ale wort. This operation will only extract one-half of the twelve pounds of the saccharum which remain-

scale, I found the result to be completely at variance with his views. As just stated, I obtained four pints and a quarter of wort from a quarter of a peck of malt. I strewed four pints of cold water on the mash, and allowed it to stand for a quarter of an hour. I then extracted nearly four pints of second wort, which, in conjunction with the quantity previously extracted, was sufficient to fill the gallon measure. When these two worts, now forming one extract, were mixed, and cooled down to 60°, I weighed them with the glass saccharometer, when the instrument appeared at 11, which multiplied by five, brings the weight to 55. To obtain a gallon of extract of this gravity, I mnst have used npwards of one and a half lbs. of sugar; and as there are sixteen quarters of a peck in a bushel of malt, and as each quarter gives an equivalent to one and a half lbs. of sngar, it follows that sixteen qnarters would give an equivalent to twenty-four lbs. of sugar. I am convinced, however, that if the whole value of the malt had been extracted, which was not the case in this experiment, I should have obtained an eqnivalent to, at least, twenty-five or twenty-six lbs. of sugar, instead of ten lbs. to the bushel of malt, as stated by Mr. Accum.

ed in the mash before sparging, leaving in it now only six pounds. Having drawn for the ale wort five gallons, containing twelve pounds of saccharum, giving a gravity of 86, and four gallons, containing six pounds of saccharum, giving a gravity of 54, making in the whole nine gallons, containing eighteen pounds of sugar, at mean gravity 72;* it now remains with the operator to endeavour to extract the remaining good, namely, six pounds of saccharum for his table-beer wort. This may be nearly accomplished, if judiciously managed, by sparging over the mash eight gallons of water, at four sparges, each sparge consisting of two gallons, drawing off eight gallons; and if the whole of the saccharum could be extracted, the gravity would be 27; but as this is scarcely possible, we will suppose only four lbs. of saccharum to be ex-

	* 5 gal. ale wort, 86 gravity.	4 gal. table-beer wort. 54 gravity.
Gal.		
5	430	216
4	216	
9)	646	
	$71\frac{7}{9}$ mean gravity.	

tracted, leaving still two lbs, with the grains.* The gravity of this table-beer wort will be 18.

I may just here notice the prejudice which exists that good ale cannot be brewed from a small quantity of malt. The idea is erroneous, and has been proved so, both by my own experience, and by that of others, providing the quantity is not too small, so as to prevent the proper temperature from being kept steadily up.

his is found to be the case if less than six bushels are employed. I find, among others, Professor Donovan is of my opinion; for to quote his own words, "I can speak from actual and extensive experience, that the fermentation of small quantities produces not merely as good, but a far better beer, in point of briskness, soundness, and body, than is obtained by the usual methods in large breweries. I need not indeed appeal to my own experience; the superiority of home-brewed ales, when skillfully managed, is well known; and although this may be attributed by some, partly to the finer portion only of the malt being extracted during the mashing, yet it must be admitted, even by these

	lbs. sugar.
* One bushel of malt, equal in value to - -	24
Extracted 9 gals. ale wort, containing 2 lbs. per gal. —	18
8 do. table beer, do. ½ lb. do. —	4
Still with the grains,	2
	—24

persons, that the fermentation on the small scale is at least as good as on the large. And if to this admission we add the evidence in favour of the small scale, founded on theoretical considerations, a case is made out well worthy of the serious attention of the practical brewer."

With these instructions, together with the information which I trust I have conveyed to him in the preceding pages, the amateur operator has an unerring guide to direct him in purchasing his malt, and brewing from any gravity which he may feel disposed to fix upon. If he adheres to the principles which have been developed and explained, there can be no doubt that he will produce an article which will amply repay him for the trouble that he has taken in manufacturing it. If he does not, as I before stated, there is a chance of his never being able to produce an article of sterling quality.

I now proceed to enter into the detail of the agents employed in brewing, and to follow it in various stages from the beginning to the end.

WATERS.

Waters differ very much in their quality and in their value, and in their power of extracting the substance from the malt. To find out the nature of the water necessary for conducting the process of brewing, is very necessary for the operator. I am convinced that waters differ so much as to affect greatly the worts, both in quantity and in quality. Most well waters are very hard, some more so than others, and such water should not be taken except in a case of emergency, when it ought to be pumped up many days before being used, and left exposed to the air. River waters, generally speaking, are better adapted for the purpose of brewing than hard, but even they differ materially in their nature. I should recommend for brewing, the water which is found best for washing. Rain water, if collected in a clean cistern, is unquestionably preferable to any other, being much softer. The advantage gained by the domestic brewer in employing rain water is very considerable: more, perhaps, than he can form any idea of, until, by the observations he has been enabled to make by the aid of the saccharometer, he is convinced of it.

For example, put eight gallons of rain water, at a temperature of 180°, on a bushel of malt; mash it well, and allow it to stand for an hour and a half. Put eight gallons of hard water in another vessel, at the same temperature, in a bushel of the same malt, and treat it in the same manner. Draw the two extracts off in separate vessels; examine a portion of each by the saccharometer, and you will find in the rain water a higher gravity—of five at the least. Measure each quantity of extract, and you will find the rain water has produced upwards of half a gallon more than the hard water; thus you have a greater gravity and a greater quantity. This is caused by the rain water having freer access to the malt, and dissolving the farina more effectually, and much sooner. It will consequently leave the grains much drier than hard water will. This is a satisfactory proof that the rain water should have the preference. I am also convinced that the first stage of fermentation, depends greatly upon the nature of the water employed.

MALT.

Malt is the next principal agent. It differs very much in quality, even from 16 to 25 per cent., and some kinds of it will differ still more. In the very best, twenty-eight pounds of fermentable matter or saccharum have been extracted from one bushel, whereas in other cases there will not be twenty-two pounds obtained. Hence it is only by knowing the gravity of the wort, and not by the quantity of malt employed, that we can have a guide to enable us to proceed with any degree of accuracy. Were we to suppose that the malt was deficient in saccharine matter, and draw off a smaller portion in consequence, while, on the contrary, this is not the case, we should then waste the malt, which might have produced a great deal more. On the other hand, if it were possible to ascertain the exact value of the malt before we drew off the extract, the waste would have been prevented. This, to a certain extent, can be effected by infusing a small quantity of malt, and determining its value before we commence to brew upon a large scale.

Unquestionably the best malt should be used, and I would recommend that which is dried at the least degree of temperature, for it contains much more saccharum than that which is dried at a higher temperature, and is consequently much more valuable. The ale made from it will also be paler in colour. Much also depends on the grinding. Some persons suppose that the value of the malt cannot be thoroughly extracted, if it is not almost ground to powder. his idea is quite absurd, for malt should only be thoroughly crushed. When it is crushed, it will discharge the wort in a much finer state into the underback, and the flavour will in consequence be superior. Care should be taken that the malt be ground at least from four and twenty to forty-eight hours before it is used. By allowing this time to transpire, all the heat which it has imbibed during the grinding escapes, and the malt is thereby mellowed. It will also receive the water much better, and a greater quantity of wort will be extracted, than if the malt were used immediately after having been ground. A visible alteration will be found in the different stages of fermentation; and the liquor will arrive much sooner at a state of perfection.

Malt contains certain portions of salts and oils; the former strongly excite fermentation, the latter retard it. The brewer's aim then is to heat the water which he intends to use to that degree of temperature which will extract as much of the oils from the malt, as will counteract the excess of excitement of fermentation, which the over-abundance of salts would produce. The heat must be regulated according to the state of the malt, whether it is pale or brown, and also whether the liquor is intended to be kept for any length of time or drunk immediately, and the intended gravity is also considered. If it is to be kept, the heat must be high at the time of mashing, in order to extract as much oil from the grain as will prevent too great an excess of fermentation. On the other hand, if it is to be drunk immediately, a perfectly different management is required.

Having given a brief account of the water and malt, I now proceed to the process of mashing, that is, extraction.

MASHING.

The copper having been filled with water, which is allowed to boil, the operator having determined upon the quantity, as well as the quality of the ale he means to brew, he allows a portion of the water, which should not exceed eight or nine gallons at first to the bushel, to run into the mash-tun. While this operation is going on, it will lose several degrees of heat, but not enough to admit of the malt being yet mixed with it. A portion of cold water is therefore put in, to reduce the temperature to from 212° to 182°. The cold water for reducing the heat, of course must be included in the eight or nine gallons. This degree of heat I have found to be the best for the domestic brewer. Care must be taken that it does not exceed 182°, as even five degrees higher would prove injurious to fermentation, and prevent the ale from coming to perfection so soon as it would have done, had the water not been used at so high a temperature.

The heat of the water having now been reduced in the mash-tun, one person is employed to throw the malt in, while another is mixing it well up with the water. This process of mashing will take at least twenty minutes, as great pains are necessary that the whole should be mashed to an equal consistency: and this consistency should not be too thin for the first mashing. The cover is then put upon the mash-tub for two hours, or rather one hour and a half, having sacks upon it for retaining the steam, as the mash must be kept as hot as possible. Private brewers generally err by allowing their mash to stand too long: the consequence of which is, that the wort runs off when too cold, and is thus rendered less transparent than it otherwise would have been. After being two hours, or perhaps one hour and a half, in the mash-tun, so covered up, the wort is run off into the under-back, the tap being partially turned at the commencement to prevent its running in too great a volume. Were the tap completely turned at first, the pressure would be so great, that a portion of the grains would escape along with the wort, and render the whole thick; whereas it should always be beautifully transparent. Where this is attended to, as well as the proper temperature of the water at the time of mashing, it will be quite clear, and form in the underback a fine transparent head, with a pearly froth several inches above the surface of the fluid. If this froth is tinged with red, and turbid, it is a proof that the heat of the water at the time of mashing has been too great. If it comes down dead, and without froth, it shows that the water was not of a sufficiently high temperature. An experienced brewer can form an accurate judgment of the future quality of his ale, from its appearance as it runs into the underback.

The heat of the wort when half run off from the mash should not be under 145°.

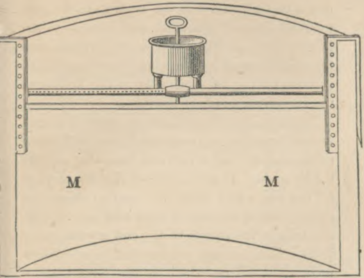
During the interval the mash is resting, the copper is filled to be ready for a second mashing, or, rather for sparging.

Sparging being preferable to a second mashing, I shall proceed with it. At the expiry of the hour and half of the mash resting, the coverings are taken off the mash-tun, and the boiling water in the copper reduced in temperature to about 188°. The tap of the mash-tun is then partially turned for the purpose already noticed, and the wort at first run into a pail placed in the underback. Whenever the wort appears fine the pail is removed and the wort allowed to run direct into the underback, the contents of the pail in the meantime being returned into the mashtun in as light a manner as possible. Whenever the surface of the mash appears, sparging should commence; and in order that it may be disturbed as little as possible, the hot water is lightly strewed over it by means of a wooden hand bowl or piggen, and the strewing is done in proportion to the running out, for, it is of the greatest importance, that the surface of the mash should not be allowed to be exposed.

As much as has been said of sparging instead of a second mashing, it may be of advantage to the reader to explain the nature of it, as well as the method of performing the operation.

SPARGING.

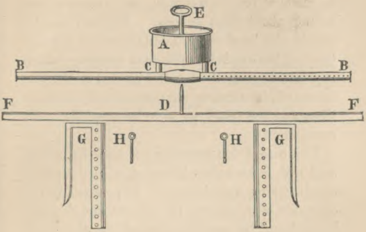
Sparging is sprinkling hot water on the surface of the mash. This may be performed in various ways. The one I would recommend is by employing a machine of which the following are diagrams:—and I may just observe, that those who constantly brew their own beer, will find that the money expended in the purchase of one, has not been unprofitably laid out.



The above is the sparging machine or sparger fixed in the mash-tun ready for use. It is a copper or tin tube of from three quarters to one and a half inch in diameter, according to the size of the mash tun, divided into two equal parts or arms closed at each end, which arms should be of such length as to allow the machine freely to work within the mash-tun. The arms or wings have a line of small holes perforated on the reverse sides, that is to say, the one being perforated before, and the other reversed—See diagrams. The holes are gradually placed nearer to each other as they approach to the ends of the wings, and a cup or receiver in the centre, at from nine to twelve inches in diameter, and from six to ten inches deep, having a hollow tube running up the centre, terminated by a handle, and a conduit communicating to each wing at the bottom of the cup on each side of the tube.

A temporary bar of iron or wood is placed across the mash-tun, two grooved iron loops being suspended, the bar is run into them and supported by pins. In the centre of this bar there is a fixed pin, which when the sparger is lowered for use runs up through the cylinder into the hollow tube of the handle of the cup working on a pivot. The cup receives the hot water—liquor technically called—which is run from a shute from the copper, and conveyed by the conduits into each arm of the machine; the pressure of the water turning it round. The water then flows through the holes from the arms in a regular and constant shower. The bar can be raised higher, or lowered at pleasure.

As the description of the first diagram of the sparger may not have been sufficiently intelligible, I have been induced to give a second engraving explained in detail.



A. cup or receiver, BB. arms, CC. conduits for supplying the arms, D. pin in the centre of the bar, which runs up the cylinder through the cup to the pivot, (a piece of steel placed just below the handle E,) E. handle of sparger, FF. bar which is thrown across the mash-tun, GG. grooved iron loops to receive the bar HH. pins which support the bar when in the loops.

The whole apparatus comprises six pieces, namely, the sparger, the two grooved loops, the bar, and the two pins.

When not in use, this machine is generally kept suspended over the mash-tun. To those who brew but seldom, perhaps a watering-pot would answer the purpose very well. This should be made of very thin copper, and capable of containing about three gallons. The two handles should also be of copper; but to prevent the heat burning the hands at the time of sparging, which it would do were the handles riveted to the pot, pieces of plane tree or ash must be fixed between them and the vessel, so as to intercept the communication.

The rose of this watering pot must be perforated with holes rather larger, than they usually are in garden watering-pots. In performing the operation of sparging, the water through those holes should be equally sprinkled over the whole surface of the mash like a gentle shower of rain, and while this is going on, either in this way or by the sparging machine, the tap is kept open to allow the wort to continue to run into the underback until the required quantity has been all drawn off.

The operator having decided upon the quantity of ale he intends making, his next object, in order that he may not be disappointed, is to guage the wort in the underback, after the sparging has taken place, bearing in mind that the process of boiling, the absorption by the hops, and the evaporation in cooling, will necessitate him to draw off about one-third more, to meet the deficiency in quantity. The gravity, however, will be increased, in nearly the same ratio in which the quantity is decreased. When the required quantity, as found by the guage, has been run into the underback, the tap of the mash-tun is turned. In the meantime the copper has again been filled and the water in it boiled, and when cooled to the temperature of 195°, it is run on to the bed of the grains, for the purpose of making table-beer. This quantity of water should not much exceed the quantity of beer intended to be made, for the wort still remaining with the mash will make up for the after losses. Before the water has been drawn off, the copper fire is damped, and two pailsful of wort must be ready to be put into the copper the moment it is empty, to prevent its being injured by standing dry over the fire. The whole of the ale-wort is then put in as quickly as possible, the fire replenished that it may the sooner boil, it being of consequence that no delay should be suffered to take place here.

BOILING.

Whenever the wort is put into the copper, one-half of the hops intended to be used is put in with it; the proportion being one pound of the best East Kent hops that can be procured to each bushel of malt. When one-half of this is well boiled with the wort for thirty or forty minutes, the remaining half is added, thoroughly mixed, and boiled for twenty or thirty minutes; making altogether the boiling of the wort and hops an hour and ten minutes. In general, an hour is found to be sufficient for bringing this process to a termination. Previously to drawing off the whole from the copper, it is advisable to take out a portion that its gravity may be ascertained by the saccharometer.

The wort must be kept boiling rapidly all the time; for fast boiling will cause it to break and fine itself much sooner than would be the case if it were kept in a slow boiling state. At the end of this time the fire must again be completely damped, and the door kept open. The wort is run into a cooler through a large hair-sieve, in order to keep back the hops, a person standing by to stir the wort in the copper while it runs from it, to prevent the hops subsiding at the bottom, which they are very liable to do. However, before this takes place, the second extraction, which is for table-beer, has been drawn off into the underback, and is ready to occupy the place of the ale-wort in the copper, the quantity and the gravity having been ascertained. Should the table-beer wort be deficient, as much cold water as is necessary to make up the quantity, allowing from 30 to 35 per cent. for losses, &c. may be poured over the grains in the same manner as the hot water; and this will completely extract any good that may yet remain in them. This table-beer wort is put into the copper along with the strained boiled hops, as soon as the ale-wort is run off, and the fire again replenished, to cause it to boil as quickly as possible; it is boiled for one hour and a half.

COOLING.

We now return to the ale-wort in the cooler; it should not exceed in depth here above four or five inches, as it is essential that the wort should cool quickly, especially in warm weather. The denser the wort is when exposed to a warm air, the more susceptible it is of undergoing such a chemical change as will prove injurious. Wort should not be allowed to remain in the cooler beyond eight hours, nor should it be allowed to cool in less than three; for, as there is a sediment in the wort which, if allowed to remain, would prove hurtful, it should have this time given it to deposit its impurities in the cooler. If, when this time is allowed, the cooler is examined after the wort is drawn off, the bed of the cooler will be found completely covered with a dirty slime, which would communicate to the ale, when fermenting, a very disagreeable flavour, were it allowed (instead of depositing itself in the cooler) to run along with the wort into the fermenting tun: hence one of the advantages of using regular coolers in domestic brewing, instead of washing tubs, and other such household utensils. The generality of private brewers, not considering this, separate their worts, for the purpose of cooling, into as many vessels as they can find, sometimes to the extent of eight or nine. The worts being of a sticky nature, there is considerable loss sustained by thus separating them, as in each utensil there must some remain by adhesion; and the sediment in each being likewise disturbed by the pouring out of the worts, the greater portion of it will again incorporate with them. On the other hand, in the regular cooler, the worts running of gradually, leave the deposit, as already noticed. Another advantage is, that by preserving the worts in two bodies, the operator can run them off into the fermenting tun exactly at the temperature he judges advisable, as they will go down at one regular degree of heat. On the contrary, when worts are cooled in a variety of vessels, they must be run into the fermenting tun at as great a variety of heats; the depth of some will be three inches, some five, others eight, and so on. These different depths must necessarily cause different heats; and without the greatest trouble is taken in ascertaining the heat of the wort of every separate vessel, as it is poured into the fermenting tun, and then calculating from the portions the heat of the whole, we can form only an imperfect idea of the mean temperature. Another disadvantage is, that having poured first a small portion of wort into the fermenting tun at a proper temperature, the next quantity out of the larger vessel will be much warmer, and will cause the fermentation, already begun, to proceed too hastily; the consequence of which will be that the wort will be injured, and will always be in a heavy state, as the yeast will not separate itself.

FERMENTATION.

The worts being now at the proper temperture, (which must be regulated according to their quantity and quality, and the heat of the atmosphere), are run into the fermenting tun. Should the quantity brewed be a hogshead, the gravity from 85 to 90, and the atmosphere 45°, the degree of heat I should recommend is 72° to 75°; perhaps the latter is the better. In brewing malt liquor a ferment is absolutely necessary, for although worts will spontaneously ferment, their disposition to do so is not sufficiently great, to cause them to proceed with the requisite regularity. So slow, and irregular, and imperfect will be their fermentation, that before the beer is formed the liquor will be sour. For this quantity—a hogshead—and at the gravity, &c. already mentioned, four Imperial pints of good brewers' yeast will be found sufficient. Two-thirds are dissolved in a portion of the wort at the temperature of 85°; and when fermentation has commenced in this, another and equal portion is added to it, when a vigorous fermentation will in a very short time commence. The portions are poured over the whole of the fermenting tun before the worts are run in ; and when the worts average from 72° to 75° of heat, they are run on to the yeast, and well incorporated with it. It is a practice with most domestic brewers to put the whole of their yeast for that brewing into the fermenting tun at once. This method is a bad one, and should be avoided;

for it is likely to cause too rapid a fermentation at first, an evil which cannot be afterwards remedied. By keeping out one-third, the operrator is enabled to feed his tun as occasion may require, putting in a portion of yeast from time to time, as he perceives the fermentation become languid; it will also prevent the evil of over-yeasting the worts.

Should the quantity be greater, the gravity less, or the temperature at the atmosphere higher, or all these three combined, less yeast will be required. Attention is necessary, lest, by the addition of the yeast, fermentation proceeds too hastily.

The domestic brewer forms an erroneous idea if he supposes that his worts should have the next morning, after being put into the fermenting tun, a fine cauliflower head; they should only have a slight cream, for the cauliflower head does not make its appearance until the second day. Fermentation should be very gradual at first, for where the contrary is the case, it exhausts itself before it has reduced the wort to the desired state of attenuation.

The next morning the white cream is mixed up with the whole of the mass, after which a portion is taken from the tun, and examined by the saccharometer. The thermometer should likewise be used, when it will indicate that heat, in a slight degree, has been generated with the decrease of gravity. The tun is again examined in the evening, and should fermentation be languid, and not proceeding with the desirable alacrity, a small portion of yeast is added and well incorporated with the mass. Next morning, if fermentation is vigorous, the cauliflower head shows itself, and has in general patches of dark brown yeast on its surface. These must be carefully removed, for were they allowed to remain, they would incorporate, and impart to the ale a bitter and disagreeable flavour. The white part of the head is again mixed with the mass, and a sample taken and examined by the saccharometer, when a further decrease of gravity and increase of heat will appear. After this the head is no more disturbed, but the tun is allowed to remain as it is, samples being taken out occasionally to ascertain to what extent it has been attenuated.

When the white foamy head gives place to a dark brown one, having a uniform appearance, and inclined to fall rather than to rise, the head is skimmed off, and the ale casked, or, technically speaking, cleansed. Were the head not skimmed off, it would fall to the bottom, and impart to the ale a flavour called by the brewers "*yeast-bitten*," which would prevent its fining itself in the cask. Great attention should be paid at this time lest the brown head fall, for whenever it gives the smallest sign of this, it ought to be immediately skimmed; and, indeed, it is safer to err on the side of cleansing it (casking) too soon, than risking its remaining too long. No part of the process of brewing is so critical, or requires more attention than this. After skimming, a portion is taken out for examination; and should it appear that attenuation has not arrived at the desired point, which should be to the one-half, or at least to two-fifths of its original gravity, it is roused well up and skimmed every two hours, until this is attained.

CASKING.

The process of casking is very apt to check the necessary fermentation; and to invigorate it again, one-half pound of flour and a quarter of a pound of salt being mixed together, are put before the fire and well heated, but not browned; this is incorporated with the mass in the fermenting tun, which is immediately afterwards casked. One very important duty is, to ascertain that the casks are perfectly clean and perfectly dry. They are placed on a stand, a little off the perpendicular; and it requires the greatest attention in filling up, that the yeast may be able to discharge itself freely from the ale by the bung-hole. By doing this there will be a greater probability of the ale arriving sooner at perfection. Were the filling up not attended to, the yeast, instead of discharging itself, would fall to the bottom. This would render the ale harsh and unpleasant, and excite it to new fermentation at every change of weather. This evil is the cause of so much home brewed ale being so thick and muddy, instead of being sparkling and transparent. Strict attention here will likewise prevent the necessity of using isinglass finings, which always have a tendency to impoverish and flatten the ale.

The ale casks are allowed to remain on the stand until fermentation has subsided, when they may be removed from the brew-house to the cellar, and so placed upon stands as to allow of the ale being drawn easily from them, either for drinking from the casks or for bottling. If this ale is made in March, and intended to be kept the whole of the summer, it is advisable to take portions of old ale and mix up in them some of the finest hops that can be procured, and place some in each cask, in the proportion of four ounces of hops to every eighteen-gallon cask, mixing them well up with its contents. In consequence of removing the casks from the brew-house to the cellar, the ale will be agitated, and a new act of fermentation excited, which should be allowed to subside before the hops are added. This may not be for two or three days. After the hops are put in, the casks are tightly bunged down with wooden bungs, called by brewers *shives*; a spile-hole made, and a vent-peg put slightly in for a day or two, and then firmly fixed. I have found, by experience, that eighteen-gallon casks are far preferable to those of a larger size for domestic brewing: their peculiar shape I shall describe when I treat of brewing utensils.

FINING.

Should the ale or beer, notwithstanding all the attention of the operator be cloudy, it will be necessary to endeavour to fine it by artificial means. The way to do this is, by dissolving one ounce of isinglass in a quart of stale beer, and allowing it to stand for several days, when a second quart may be added, the whole then strained through a sieve, and half an Imperial pint of these finings put into each eighteen-gallon cask, taking care to mix it well up with the contents. The casks should then be tightly bunged down; and in a few days the ale will be fit for use. Fining ale is a very bad practice, and should not be adopted without an absolute necessity, for finings made from Isinglass have a tendency to flatten beer as has been already stated, and not only so but also to promote acidity, especially if the cellar be not particularly cool, or the ale not very strong.

We left the table-beer in the copper, where it was to boil, with the hops in it, for an hour and a half. It is then drawn off in a similar manner as the former wort through a sieve into the cooler, in which it is allowed to remain until the heat has decreased to 75°; a portion is now taken out, examined by the saccharometer, and noted. A good gravity for table-beer for keeping is from 50 to 60. One quart of good brewers' yeast is mixed up with a gallon of wort from the cooler, at temperature 85°. When fermentation has commenced, which will be the case in the course of half an hour, this mixture is poured into the fermenting tun, in the same way as that for the ale; the wort is let down upon it at a temperature of 75°; the following day it is casked, and filled up as frequently as the ale was. The fermentation, in general, will subside in four days, when the casks are bunged down and removed into the cellar. If the beer is not intended for immediate use, it will tend greatly to its preservation to put a small quantity of hops in each cask; the casks are then bunged down, and left to stand in the cellar, with a spile loosely placed in the spile-hole for a day or two, and then put firmly in.

MODE OF MANAGING A BREWING OF EIGHT BUSHELS OF MALT, WHICH SHOULD BE OF THE VERY BEST QUALITY, AND PALE.

Each bushel should weigh from forty to forty-five pounds. From these eight bushels of malt, one barrel, containing thirty-six gallons, and one half hogshead, containing twenty-seven gallons, making in the whole sixty-three imperial gallons of good ale, and twenty-seven gallons of excellent keeping beer, should be the result of this brewing, if judiciously conducted.

The malt having been ground some time previously, as already directed, the mash-tun perfectly clean, and the water in the copper boiling; sixty gallons of it are run into the mash-tun, and five, six, or seven gallons of cold water, more or less, are added, to reduce the boiling heat of 212° to the temperature of 182°. It is better to have it rather under that temperature than over it; in most cases 180° may be preferable. The malt is then put into the mash-tun by one person, while another mixes it, in order that it may be blended and mashed to a proper consistency. This operation takes from twenty to thirty minutes, as every ball or lump must be properly broken. The cover is put on the mash-tun, and the sacks from which the malt was taken, along with a blanket, put over this cover, as every means are necessarily employed to keep the mash as hot as possible, by preventing the escape of the steam. The copper in the meantime has been re-filled. The mash remains thus covered for one hour and a half. At the expiry of this time, the tap of the mash-tun is partially turned, the first running received in a pail until the wort is perfectly clear, the contents of the pail returned into th e mash-tun, and the clear wort allowed to run into the underback, the volume being gradually increased by turning the tap.

The cover is now removed from the mash-tun, and before the surface of the mash appears, about sixty gallons of water more or less, at temperature from 188° to 190°, are showered by the watering-pot already described—that is, if a sparging machine is not used. The sparging liquor should exceed the proportion of the running from the mash-tun into the underback, so as to keep the goods in the mash-tun always covered.

I would strongly recommend that there should be at least three taps at the bottom of the mash-tun, which in a great measure will equalize the pressure. Were there only one, the pressure would be so great at that part, that the wort would not run clear.

Assuming that the mash-tun has the three taps running, it will fully occupy the man's time to sparge until the required number of gallons for the first wort, has run into the underback. The taps are now shut, the sparger for the present ceasing his operation, the wort in the underback measured by the guage stick, and its gravity ascertained by the saccharometer. The quantity should be about 40 gallons, but should it be found deficient, the taps are again turned until the number is made up. The gravity will likely be about 81. When it is thus ascertained that 40 gallons are in the underback, the taps are again shut, the copper fire thoroughly damped, the whole of the hot water in the copper drawn off into a barrel to be ready to resume the sparging. The wort from the underback is now put into the copper as quickly as possible, 8 lbs. of the best Kent hops having been weighed, 4 lbs. of them are put along with it into the copper. The fire is now made to burn briskly, in order that the wort with the 4 lbs. of hops may be caused to boil as soon as possible, and may be kept quickly boiling, for the more quickly the wort boils, the sooner it will break. It should thus boil for from sixty to seventy minutes. This is quite a sufficient time for worts, if kept boiling quickly, whatever their strength may be. Most domestic brewers form a very erroneous idea on this subject, and suppose that their ale will not keep unless the worts are boiled for a long time; and indeed some absolutely boil them for three hours, and, besides, put the whole of the hops they intend to use into the copper at once with the first wort. This long boiling and with all the hops in the copper at once, I have tried, and found it to be a very bad plan, destroying the whole aromatic flavour of the hops, a flavour which should be allowed to incorporate itself with the wort.

By putting one-half of the hops into the worts at first, and allowing them to boil for thirty-five or forty minutes, by which time, if the worts boil quickly, they will be broken, and then adding the other half of the hops, the goodness of the former quantity is extracted, and the aromatic flavour of the latter retained, the remaining good being preserved for the benefit of the second wort. By adopting this mode of boiling the hops, I have found the flavour of the ale to be much more delicate than when all the hops are put in at first and boiled the whole time; for in this case they impart to it a coarse and disagreeably bitter flavour. The hops also are more valuable for the second wort.

The gravity is next ascertained by the saccharometer, and noted in a book kept for the purpose.

The operator ought to be made sensible, that when he brews from a quarter of malt (which is a very good quantity for a family brewing), he has in his mash-tun saccharine matter as valuable to him as about 200 lbs. of sugar, taking it for granted that he uses good pale malt. He must bear in mind, however, that scarcely one-half of this saccharum can be extracted by the first mashing, should equal measure of water and malt be employed, namely, eight gallons of water to each bushel. In this case, I have assumed that sixty-six gallons of water have been used for mashing, and forty gallons have been drawn off, the gravity of which is 81, this is equal to two pounds and a quarter of sugar per gallon, those forty gallons of wort contain ninety pounds of the two hundred of saccharum ; and the second wort having been drawn off to the extent of forty-two gallons, will deprive the mash of seventy-three pounds more, leaving only thirty-seven pounds of saccharum for the table-beer. Thus there are forty gallons of the first wort at 81 gravity, and 42 gallons of the second wort at about 63 gravity, the whole amounting for the ale wort to eighty-two gallons, the average gravity of which must now be ascertained. This is done by multiplying the two worts by their respective gravities, then adding the products together, and dividing by the number of gallons.

First wort.			Second wort.
	40 gallons.		42 gallons.
	81		63
	40		126
gall.	320		252
40	3240		2646
42	2646		
82	5886	$71\frac{3}{4}$	
	574		
	146		
	82		
	64		

By this example it will be seen that the mean gravity is so nearly $71\frac{3}{4}$ that it may be called so.

Having now extracted one hundred and sixty-three from the two hundred pounds of saccharum, the whole value of the eight bushels of malt, there remain only thirty-seven for the table-beer wort, and to produce twenty-seven gallons of table-beer we must draw off at least forty gallons to make up for losses by boiling, evaporation, &c. Having sparged sixty gallons for the second wort, and drawn off forty-two, there remain on the mash eighteen, and now to make up forty gallons we require to sparge on twenty-two. It is of little moment of what degree of heat the water is for this last operation, the warmer the better.

If it were possible that the whole of the remaining saccharum in the mash could be extracted by this operation, these forty gallons when drawn off, would be of a gravity rather better than thirty-three; but this is not possible; there will be at least nine pounds of it left with the grains, so that the gravity will be reduced from thirty-three, to about twenty-five, far too low a one to produce good beer. I propose, therefore, that a half pound of sugar should be added to each gallon of the wort in the copper, say twenty pounds, which will increase the gravity to 43, and when the worts are reduced in quantity by boiling, evaporation in the coolers, &c., the gravity will be increased in proportion, and will be very nearly 55. Worts have a very great tendency both when running into the underback, and when there, to imbibe oxygen, and thereby frequently prove ultimately unsound; to endeavour to avoid this evil, I have generally put about a quarter of a pound of hops in the underback just under the taps: this practice, along with the precaution of excluding as much as possible a current of air, is the only means which can be resorted to.

It may be as well before proceeding further to recapitulate, in order that the reader may thoroughly comprehend what has already been detailed.

We run sixty gallons of boiling water into the mash-tun, to reduce the heat of which to 182°, we added seven gallons of cold water, making in all sixty-seven gallons. We then turned into the mash-tun eight bushels of malt, each bushel of which absorbed rather more than three gallons of water, so that the eight bushels have taken up say twenty-seven gallons, leaving only forty; and had the first wort been allowed to run off to the full extent before sparging, we could not have drawn more than that accounted for, namely forty gallons. As this is the case, we must consider that the same number of gallons as of water sparged on, remains to be accounted for in the mash.

When we had opened the taps for the first wort, we commenced and continued sparging the whole of the time, until forty gallons were run into the underback, and the quantity sparged on during this time was sixty gallons; so that, when we shut the taps after the forty gallons were run off, we left in the mash sixty gallons. We again opened the taps and run off from the sixty gallons, forty-two for the second wort, and when this was accomplished, we once more shut the taps, leaving in the mash eighteen gallons ; consequently we have to sparge on, only twenty-two gallons more of water to make up the forty which were required for the table-beer wort. These forty gallons we run off, and the gravity being only 25, we added a half pound of sugar to each gallon, namely twenty pounds; bringing up the gravity to 43, and put the whole into the copper after the second wort had been removed.

The addition of sugar does not only increase the gravity, but imparts to the ale that richness of flavour of which the first running from the mash has in a great measure deprived it. For in malt extracts, the first running from the mash is more valuable to the brewer than the second: that is to say, a second wort of 30 gravity is not so valuable, as a third part of a first wort at 90, because the first running contains a less proportion of mucilage to the sweet, than the second. It now remains with the operator to choose whether he will use the small portion of sugar recommended, and if he does, whether he intends his ale to be pale or dark. If he wishes the former, light sugar is used, and if the latter, that of a dark character is employed. I stand not alone in opinion that a portion of sugar with malt improves the flavour of ale. Professor Donovan even prefers ale made entirely from sugar, as the following short extract shows :—

"To persons who have acquired an inveterate predilection for the abominable and varied flavours which the *skill* of the brewer enables him to communicate, this pure and simple drink may be less pleasing; but it is singular how soon the consumer acquires a high relish for it, and prefers it to every other. There is a purity of taste belonging to it, quite different from the indescribable jumble of tastes so perceptible in common ales; and a light sharpness, combined with tenuity, which is much more agreeable, than the glutinous, mucilaginous softness of even the best ales. But it has one advantage which places it above all competition, and that is, its lightness on the stomach; this, when compared with the sickly heaviness of malt ale, is really remarkable."

Observation.—It is not unlikely that the first sparging may draw off more of the saccharine matter for the strong ale-wort than has been mentioned above, and consequently the last sparging for table-beer wort may not be so strong; but the saccharometer will indicate precisely the gravity, which may be raised by sugar as required.

To return to the ale-wort, which we left in the copper with the four pounds of hops.—This is boiled thirty-five or forty minutes, when the remaining four pounds of hops are added, and allowed to boil with the rest for twenty minutes. The copper fire is then completely damped; the wort run off into the cooler through a sieve. The table-beer wort, which is now in the under-back, must, with the boiled hops and sugar (if any is to be added), replace the ale-wort in the copper; the fire is replenished, and this wort made to boil quickly and briskly for one hour and a half; at the end of which time it is drawn off into the other cooler, in the same way as the ale-wort.

As I have already entered into the particulars of fermenting, casking, &c. I shall only now take a cursory view of the after management.

Four or five pounds of yeast are mixed with a gallon of the ale-wort, as already noticed, at the temperature of 85°. When fermentation has commenced in this portion, another gallon of wort is added to it; and, just before the worts are cooled down to the proper temperature, 67° in moderate weather, and 73° in winter, these two gallons containing the yeast, which will now be in a state of fermentation, are *strewed* or spread over the fermenting tun, and the worts let down upon them. The further process, relative both to the ale and to the beer, has been fully described in the former part.

N.B.—Two or three pounds of yeast will be sufficient for the table beer.

Having given an example of a brewing from eight bushels of malt, I proceed to give merely an outline of two others, one from six and the other from four bushels, and with sugar as an auxiliary, both in the strong ale and table-beer. In these examples a barrel of strong ale, and a hogshead of table or keeping beer, will be the result.

We run into the mash-tun as in the former example, forty-seven gallons of boiling water, and three of cold, making fifty gallons. When the temperature has been reduced to 182_0, we shute into the mash-tun six bushels of malt, which if very good are equal in value to one hundred and fifty pounds of sugar. After mashing and allowing it to remain infusing for the same period as in the former example, the taps are opened, and while the worts are running into the underback, sixty-five gallons of water at temperature 192° are sparged on. We find by the guage stick when fifty gallons of wort are in the underback and the taps, leaving in the mash forty-five gallons. Previously to shutting the taps, the copper fire has been damped and the boiling water in the copper run into a vessel ready for the next sparging. We then put the fifty gallons of ale-wort into the copper (I assume that the copper will hold eighty gallons, but if it will only contain forty, the ale-wort must be divided) supposing it to hold in solution one half of the saccharum of the malt, namely seventy-five pounds, the gravity will be 54. We therefore put into the copper with it forty pounds and a half of sugar, being three quarters of a pound to each gallon of wort, which will raise its gravity from 54 to 81. We add two pounds of the best East Kent hops, and when it has boiled for thirty minutes, three pounds more are added, and the whole boiled forty minutes longer, making the time of boiling the ale-wort, one hour and ten minutes.

About twenty minutes before the wort is ready for running off from the copper, the taps of the mash-tun are again opened, and while the wort for the table-beer is running, twenty-two gallons of the water which had been drawn from the copper are sparged on. This quantity, and the forty-five gallons which were left in the mash with the half of the saccharum 75 lbs. —the whole being 150—measure sixty-seven gallons, which if the whole of the saccharum was extracted would give a gravity of $40\frac{1}{3}$, but as there will be five lbs. left with the grains, the gravity will be only a little more than 37. To bring this gravity up to $48\frac{1}{2}$ we add twenty-two pounds and a half of sugar.

The ale-wort having been run off into the coolers, and the table-beer wort being ready to re-place it, we put it into the copper with the sugar and two pounds of fresh hops, and boil it for forty-five minutes, then add the drained hops, and boil the whole forty-five minutes longer, making in all one hour and a half, it is then reduced in the coolers to the same temperature as in the last example for the quarter of malt, and treated in a similar way. See example brewing from a quarter of malt.

I now come to the last example, that of brewing from four bushels of malt, and as this is half the quantity of the first, namely, the quarter of malt, very few remarks are necessary; especially as in that example such full directions have been given, as well as a recapitulation of the whole process; all I have therefore to say here is, that the smaller the quantity which is brewed, the less time the mash should be allowed to infuse, and a higher pitching heat will be necessary; or, untechnically speaking, the heat of the wort should be a degree or two higher than in the first example.

With respect to the use of sugar in increasing the quantity and gravity, the operator will be enabled to accomplish his end very easily by attending to the instructions already given relative to he value which sugar imparts. See page 51.

PORTER.

Although I am aware that very few families ever think of making their own porter, yet a formula for this manufacture may not be altogether useless. For making porter, three kinds of malt are necessary—the pale malt, the brown malt, and the patent black malt. For making a hogshead without table-beer, four bushels of pale, two bushels of brown, and fourteen pounds of patent black malt are employed. The malt having been crushed or ground forty-eight hours previously, sixty gallons of boiling water are run into the mash tun, and when reduced with cold water to the temperature of 175° or 180°, the malt is put in, in a similar manner, as for the ale. It is mashed for twenty minutes or more, until it is brought to an equal consistency. The cover is then put on, the malt sacks and the blanket placed on the top of it, to keep the wort as warm as possible. In the meantime the copper having been refilled, the water is preparing for the second extraction. The mash stands thus covered for an hour and a half, the tap is partially turned, the first running received in a pail until it appears clear; when the contents of the pail are returned into the mash-tun, and the extract allowed to run into the underback. When thirty-five gallons have been run off, the tap is turned, thirty-five gallons of water, at a temperature of 190°, are strewed over the bed of the grains, in a like manner as described for the ale, and allowed to remain covered up for one quarter of an hour, then run off into the underback in the same way as the first extraction, leaving the grains perfectly dry. The copper being empty and the fire damped, the wort which should measure seventy-four gallons, is put in as quickly as possible, with four pounds of the best East Kent hops, and boiled briskly for thirty or forty minutes. The remaining four pounds of hops are then added, and the whole is boiled an additional twenty-five minutes. A portion may be taken from the copper and examined: and should the operator not find it so brown as he wishes, he may put in ten ounces, or one pound, of the best Italian juice, broken, that it may dissolve. In fact, this juice should be put into the copper with the first quantity of hops. The wort is then run through a sieve into the cooler; the further process is the same as the ale. This porter will be equal in gravity to the best London Stout. The gravity should be taken before the worts enter the copper.

N.B.—As there will be some goodness still with the mash, a very excellent table-porter may be obtained by putting on the mash about twenty-seven gallons of cold water, and allowing it to percolate through the grains, so that that quantity may run into the underback; and to each gallon a half pound of sugar and a half pound of treacle, with the hops that were strained, added, and boiled for one hour and a half. This quantity will make eighteen gallons.

THE INTERIOR OF A BREWERY.

As some readers may feel inclined to convert a portion of their out-houses into a brewery, I shall now give a plan of the interior of one, so constructed as to enable a single individual to conduct the process with the greatest ease, by obtaining the occasional assistance of another. In this plan I have kept economy in view. Brewing, especially in private houses, is too often left to the care of servants, who, at the same time, having other business to perform, very often neglect the main object; therefore, I should advise those who intend to brew, to have no other business on that day to distract their attention. Any part neglected might prove fatal to the accomplishment of the object; hence failure is too often the case.

THE COPPER.

The copper being the utensil first used, I shall commence with it. I should recommend this vessel instead of being made of iron, to be made of copper, for the following reasons: 1st, a copper boiler being thinner than an iron one, the liquor will be sooner heated, and consequently much less fuel will be required; 2dly, it will, at any time within fifteen or twenty years, fetch nearly half its cost; 3dly, it is less liable to accidents than a cast-metal one; 4thly, it is cleaned a great deal easier: for these reasons the public brewer always makes use of a copper boiler, in preference to every other. For those families who wish to brew only a hogshead of ale and a hogshead of table-beer, the copper should be of sufficient capacity to boil eighty-five gallons. I should recommend a curve made of wood, of four or five inches in depth, to be placed round the rim of the copper, to keep the worts from spilling when boiling rapidly; or instead of the wood, a sheet of lead fixed round the brim in a sloping position, so that when the worts are boiling rapidly, (which they should always do,) they will fall on the lead, and immediately return into the copper; this will prevent a considerable waste in the boiling of the worts, and the copper then might be smaller. I should advise a pipe of the diameter of 1¾ or 2 inches, and of the length of three or four inches (so that it may come out beyond the stone or brick work in which the copper is set), to come out from the level of the bottom of the copper, at the extremity of which pipe a cock (or tap), without a nose, is fixed. The advantage of using this kind of tap, at the time of brewing, is, that the hops which are very apt to choke up the passage in a tap with a nose, have free access out, this being completely horizontal. There exists an evil here to be corrected. As it is absolutely necessary that the tap should be fully turned, to allow the hops to run out with the wort, the pressure would be such as to cause the worts to run with too great velocity; and, in this case, they would be liable to be spilt when running into the spout which is conducting them to the cooler, were they not directed; for this purpose a piece of canvass is rolled twice round the top of the tap, and tied and placed in the spout, by which the force of the worts is broken, and they are carried along the canvass, which should be about twelve or fourteen inches in the spout. It is advisible for every brewer to know the gauge of his copper; not only what it will hold when it is full, but what quantity may be in it at any time of the process; this is easily accomplished by having a gauge stick. Two gallons of water may be placed in the copper, the stick put in, and where the surface of the water cuts it, let it be marked; other two gallons put in, and another mark put on the stick, and so on for every two gallons until the copper is filled. The stick should either be black with white lines, or white with black lines, so that they may be easily seen; and the number of the gallons should be marked on every line; this should be called the copper gauge-stick, and marked No. 1. It is very necessary that the operator should gauge his copper always in one place; and for this purpose, it would be well were he to make some mark in a particular part of it, as a guide to direct him.

THE MASH-TUB OR TUN.

The mash-tun should be of a capacity to hold 140 to 160 gallons; it should have a false bottom, which is to be made of several pieces, and perforated with small gimlet holes, very close to each other. A hoop of wood is to be nailed inside round the bottom of the mash-tun, of about two inches in breadth, to support the false bottom, which should be about two inches above the real one. Where a false bottom is used, I would strongly recommend, for reasons already given, See page 358, three taps to be placed at the bottom of the mash-tun equally distant from each other in a triangle; but care must be observed that they are not driven in so as to protrude above the surface. I consider a false bottom, for many reasons, so great an advantage, that I should advise such families as brew their own ale never to have their mash-tun made without one, even for so very small a quantity as a two-bushel brewing. First, the operation of mashing can be more expeditiously performed, by having a free access to every part of the mash-tun, which is impossible where the old-fashioned method is employed, with a wicker strainer placed in the tun over the tap-hole, as they cannot stir the grains with the same freedom, especially where the strainer is placed; consequently some portion of the malt will, of necessity, remain unmixed with the water. 2dly, It will drain the grains much drier, and the sediment is not so apt to accompany the worts into the underback, as in the former method; this is a great advantage in the boiling, for the freer the worts are of sediment, the sooner they will break, and require the less boiling. 3dly, In consequence of the worts being thus deprived of all sediment, the flavour of the ale will be much more delicate.

Two mashing sticks will be required, called by brewers *oars;* these are poles about six feet long, with a frame at the bottom, with about six spars of wood across; this ladder bottom is twelve inches long, broader at the top than at the bottom, somewhat shaped like an inverted shovel: these spaces between the spars are for the purpose of allowing the grains to fall through, when a lump is taken upon them and shaken. Wooden rakes similar to those employed in hay-making, with the teeth somewhat longer, would answer the purpose of mashing equally well. For measuring the water in the mash-tun there must also be a guage stick, marked No. 2. The mash-tun should have a flat cover, made in three pieces.

THE UNDERBACK, OR RECEIVER FROM THE MASH TUN.

The underback must be greater in diameter than the mash-tun, but only about one half the depth, and of such capacity as to hold from eighty to ninety gallons. The underback should also have a tap to it, and a guage-stick, marked No. 3. This tap is placed at the side.

THE COOLERS.

The coolers should be made square or oblong, as may suit the brewhouse, and should be of such capacity that each may contain from seventy to eighty gallons of wort at three inches depth, and have its sides above the wort from two to three inches. At the end of each cooler there should be an opening with a sluice to shut down, or by being fully lifted up, or partially, to allow the worts to run rapidly or slowly, as occasion may require, or, if the fermenting tuns are near the coolers, which they ought to be, pipes placed at the bottom of each to the tuns will answer as well, if taps are placed in them. A wooden spout, of about five or six inches broad, and four or five deep will be required, of sufficient length to carry the worts from the copper to the coolers, rather deeper for two feet next the copper, than at the end next the cooler. At the extremity next the copper, a groove is to be cut, so that the pipe of the copper may be a little under the edge of the spout.

FERMENTING TUNS.

The fermenting tuns should be of sufficient capacity to hold eighty-five to ninety gallons each ; they should have taps at the bottom ; these taps should be made with screws. It would save much trouble as well as time and beer, to have leather pipes of sufficient length, when screwed on to the taps, to draw off the contents from the fermenting tuns into the casks, at the time of casking or cleansing.

CASKS, AND CASK STANDS.

The casks ought to be those of the bell shape, the narrow part at the bottom. The bung-hole at the top should be sufficiently large to admit of a person's hand and arm going in to clean the cask ; these bung-holes ought to have wooden plugs to fit them exactly. The stands should be about eighteen inches or two feet high.

Besides these utensils, there are required a couple of pails to hold three gallons each, a wooden piggen to hold a gallon and a half, steps so high and so constructed as to allow a person to stand in security to stir the worts in the copper, and a shovel to throw the grains from the mash-tun. Having described the utensils necessary for brewing, I now proceed to show the way in which they are to be placed, so as to avoid expense and unnecessary labour.

THE BREW-HOUSE.

The brew-house should be lofty, so as to admit of the copper being sufficiently high to allow the contents to run into the coolers, and then again from the coolers into the fermenting tun, and from the fermenting tun into the casks; and these last should be set on stands from eighteen inches, to two feet high from the ground.

THE COPPER.

The copper should be set near the entrance of the brew-house: and, as already stated, it will necessarily be placed the highest of the utensils. It will require a ventilator above it, to allow the steam to escape.

THE MASH-TUN.

The mash-tun must be placed as near the copper as possible, so as to allow the liquor to run rapidly into it, and thereby retain the heat. It should have a stage round it, that the persons employed in mashing, by being raised, may have power to perform the operation. It must not be too near the wall, as this would prevent their using the mashing-oar with freedom.

THE UNDERBACK.

The underback should be placed on a temporary stand, directly under the mash-tun, and sufficiently high to allow its contents to be drawn off into pails, as necessity may require.

THE COOLERS.

The coolers should be placed as near the mash-tun as possible, leaving a sufficiency of space for the mashers to work freely. They should be at the least seven feet from the ground, and a little below the level of the bottom of the copper. One cooler should be placed on one side of the brew house (which must be of an oblong form,) and the other on the other side, exactly opposite: a space should be left on each wall for a slap shutter behind the coolers, of the same length as they are, of the depth of two feet, or two feet and a half; the bottom lines of the spaces being on a level with the top of the coolers, in order that there may be a free circulation of air. The coolers should be a little higher at one end than at the other, that at the time of drawing off, they may completely empty themselves. Care, however, is necessary here that they may not be too much so, as the sediment would come along with the worts, when they are rapidly drawn off, which will be on some occasions. The pipes of the coolers are placed at the lower ends, to conduct the worts into the fermenting tun. It would be advisable, besides the ventilator over the copper and those behind the coolers, to have one at the top in the centre of the brew-house; and this will be a great means of preserving the wood work.

I should recommend the brew-house to be paved throughout, and so arranged that one part shall be higher than another, to allow the water to run freely off by the sewer at the time of washing it. There should be a place very near the copper to hold the coals.

TUN ROOM AND CELLAR.

This apartment, separated by a wall, should be immediately behind the brew-house, and paved in a similar manner, for the same reason, as cleanliness is of the greatest importance in every part of the process of brewing; and that the floors should be kept always dry as well as clean, is absolutely necessary. The tun-room will require a small window, if possible in a north wall. The stands with the casks should be on the north side. The fermenting tuns on stands should be placed behind the walls, at the ends of the coolers, that the pipes from the latter may have an easy communication. This tun-room will answer the purpose of a cellar as well.

THE END.

WILLIAM MACPHAIL, PRINTER, 2, GREENSIDE PLACE.

SUPPLEMENT, &c.

Since the publication of the Fourth Edition of the British Wine-Maker, in the summer of 1847, I have been induced, through the suggestion of a scientific gentleman, secretary to the oldest Horticultural Society in England, to make various experiments on the stems of the rhubarb plant, for the purpose of ascertaining how far its properties were available for the production of wine. Before proceeding to give the results of these experiments, I may mention that I made a quantity of wine from this plant about twelve years ago, and from its proving so very superior, both in flavour and durability, I was convinced that the rhubarb was peculiarly adapted for this purpose, and I was surprised that such a fact was, as I may say, altogether unknown.

That the grape, in those countries where it abounds, is the best calculated for the production of wine, is undeniable; but in this country, where a sufficient supply cannot well be obtained, except at too high a cost, to produce a *must* naturally, and where an *artificial must* is absolutely necessary, the rhubarb stalk is in some respects preferable, which I think I shall be able to prove, and also to point out means so effectual for the production of wines from this plant, that they cannot be distinguished from those of a foreign growth, and that the success of the process will not only be complete, but attained with very little trouble.

In making wine from the stalks of rhubarb, it will be necessary, before arrangements are made for apportioning the quantity of this plant, to decide whether the wine intended to be produced is to be sweet or dry. If sweet, six pounds weight of stalk to a gallon of water would be a proper proportion; but if a dry wine, to imitate Hock, Vin de Grave, &c., is wished, more than double that weight will be necessary. I have found that the stalks of rhubarb, when ground or grated, and thoroughly pressed, will yield very nearly eighty per cent of juice;* so

* The Rhubarb used in these experiments, it is proper to notice, was of a very superior quality, and the stems from which the wines made by me were produced were particularly selected, all the inferior portions having been cut off. Had this not been the case, it is most likely that 80 per cent

that by using thirteen pounds we would have rather more than tèn pounds of juice, and, by adding one gallon of water to every thirteen pounds of rhubarb stalk, when pressed, we should have two gallons of juice and water; viz. ten lbs. of rhubarb juice giving one gallon, and ten lbs. of water giving one gallon.

The pure juice of the rhubarb contains very little of the saccharine principle, producing only a gravity of 15 or 16; but it abounds in the acid and fermenting principles. It therefore requires a large proportion of sugar to bring up the *must* to the gravity of the desired standard for dry wines, namely, 130; but, from the abundance of these principles—namely, the acid and fermenting—it is better for the wine-maker's purpose than any other juice from our native fruits, for attenuating this large quantity of sugar to the low degree necessary for those wines.

This mixture, made with 13 lbs. of rhubarb stalk to the gallon of water, will take about 3½

of juice would not have been obtained: so, to err on the safe side, it may be as well to give a statement wherein the juice obtained is 75 per cent. This will require a little more than 13½ lbs. weight of stem to give 10 lbs. of juice, giving a gravity of about 15. Therefore, to make the quantity of Hock as in the example, it would require 162 lbs. of stem, and for the Champagne about 113 or 114. It must be kept in view, that it is of importance that the rhubarb should be used as soon after being cut as possible.

lbs. of sugar to each gallon, the sugar giving an excess in quantity of $1\frac{3}{4}$ pints to each gallon.

EXAMPLE.

	Galls.	Pints.
13 lbs. rhubarb stalk giving . . .	1	0
10 " water	1	0
Excess occasioned by 7 lbs. sugar, . .	0	$3\frac{1}{2}$
Total, . .	2	$3\frac{1}{2}$

As already observed, Hock, and the other dry wines, require to be attenuated to a much lower degree than Champagne, and the sweeter wines. Were we to use only six lbs. of rhubarb stalk to each gallon of water for these dry wines, we should have too little of the fermenting principle to accomplish our end, for the *must* would contain only one-half of the quantity of pure juice, in proportion to the water, and this would be quite insufficient. Before proceeding to the manipulation, it may be as well to give some idea of what implements and utensils will be required by those who intend annually to make wine from the rhubarb stalk.

IMPLEMENTS AND UTENSILS.

These are, 1st, An Apple-Mill, on a very small scale, and simple construction.

2d, A Fermenting Tub, such as is described in the British Wine-Maker, page 92.

3d, A Cask of the same description, but less in size, capable of containing, say 18 gallons, with two or three tap-holes on a line, in the front, and near the bottom; the top being taken out, and a flat circular slab of wood, with a few perforated holes, made to fit the interior. This slab, with one or two half hundred weights placed on it, is to act as the pulp-press.

4th, A Sherry quarter Cask, capable of containing about 28 gallons.

5th, Two Tubs similar to washing-tubs, of capacity 15 gallons each; one to receive the pulp from the mill, the other to receive the juice from the press.

6th, A Hair Sieve and stand.

HOCK FROM RHUBARB STALKS.

We assume that the quantity of Hock to be made is 27 gallons. Here, it will not be necessary to carry out the practice so often recommended in the British Wine-Maker, of making two additional gallons, for reasons to be given in the after process of casking. The weight of rhubarb stalk required will be 156 lbs. The Apple-Mill is placed on the stand, with one of the tubs under its spout, and the stalks are to be thrown into it, and ground. The pulp, after having been deposited in the tub, is conveyed to the small cask, namely, the press. This press is also placed on a stand, so as to admit of the other tub being under it, to receive the pressed juice which flows from the tap-holes. The juice is then strained through a sieve into the fermenting-tub. Meanwhile the slab with the weights on it is put on the pulp in the press, and the pressed juice thus procured, strained and added to the former. At the expiry of an hour or so, the corks may be replaced in the tap-holes, and the slab and weights removed.

The juice which has been strained into the fermenting-tub will measure about 12 gallons or so, at 15 gravity, a little more or less. Twelve gallons of water, if possible at the heat of 80° to 100°, are to be poured on the pressed pulp in the small cask or press, the whole thoroughly agitated, and then allowed to remain eight or ten hours, in order to extract what value may have been left in the pulp; after which, this liquor is to be drawn off in the same way as the pure juice, and added to it in the fermenting-tub. The pulp is to undergo a second pressing with the slab and weights. This pressed liquor is to be added to the former juice, which should measure now, in the whole, 24 gallons, of gravity about 8. The reason I say 8 is, that the pure juice of gravity 15, if mixed with an equal portion of pure water, would be reduced one-half, *i. e.* 7½;

but this water, having been poured upon the pressed pulp, has acquired a trifle of gravity, say half a degree, or perhaps a little more.

The next consideration is the proportion of sugar. The kind which I would recommend is the finest East India, either Corsepores or Dobahs of the finest quality. If neither of these can be readily procured, the finest crushed sugar may be substituted. As this wine—Hock—should be pale in colour, the whiter the sugar the better. Eighty-four pounds are to be put into the body of juice and water in the fermenting-tub, which will cause it to measure about twenty-nine gallons. Along with this sugar, at the same time, three-quarters of a pound of tartaric acid, which previously has been thoroughly dissolved in a little boiling water, is to be put in, and the whole is to be then well mixed together. The reasons for using tartaric acid in preference to crude tartar, will be seen in the British Wine-Maker, page 160.

The fermenting-tub, containing the *must*, is to be placed in a warm situation, and the *must*, weighed with Roberts's saccharometer, which will indicate perhaps a degree or so more or less than the required standard, 26 *i.e.* 130. If more, a little boiling water may be added to reduce it; if less, as much sugar as will bring the *must* up to that point.

It is then allowed to ferment until it is reduced in gravity to about 80 or 90, being in the interval carefully stirred and weighed. When reduced to 80 or 90, it is to be casked.

CASKING.

For this purpose a newly emptied Sherry quarter cask is very suitable, this kind of cask running from twenty-seven to twenty-eight gallons. There will be sufficient *must* in the fermenting-tub to fill the cask at first, and enough over to continue filling it during the time it remains unbunged. This cask is to be placed in a position as described in the British Wine-Maker, see page 96. During the time the wine is fermenting, and before being bunged down, the saccharometer may be occasionally inserted at the bung-hole, in order to ascertain what progress the wine, now properly so called, is making in its attenuation. This examination may take place once a-week. When it has been reduced to one-half of its original gravity, say to 65, the cask may be bunged down, and the wine allowed to remain undisturbed until October or November, supposing it to have been made in May or June. By this time it should be reduced to about 30 of gravity. If, however, at any of those examinations it is found that the wine has attenuated below 30 before the period just mentioned, it must be immediately racked off, to prevent its being too much reduced.

To those who can easily procure Sherry quarter casks, I would strongly recommend at this point in the process, to get another which has been newly emptied. This cask is to be twice fumigated at about an hour's interval. For conducting this operation, see British Wine-Maker, page 103.

After the cask has been fumigated, two gallons and a-half of the finest old Somersetshire cider, with half a gallon of Bucellas wine, are to be put into it, the cask bunged, and well rolled about, to incorporate the fumes of the brimstone with the contents. The clear portion of the wine is then to be racked into it until it is filled, allowing, however, sufficient room for the finings, which are now to be put in, according to the process explained in the British Wine-Maker, page 99.

Observation.—If good old Cider could be readily procured, and three gallons and a half were put in, instead of two and a half, along with one and a half gallons of Bucellas, this wine would be still better.

CHAMPAGNE FROM RHUBARB STALKS.

I will now proceed to detail the method of making Champagne from rhubarb stalks.

In the first place, however, it is proper to mention that an individual obtained a patent in 1840 for making Champagne from this plant.

The basis of the specification is stated thus: "The claim for this improvement in making wine, is the application of the product from the stems or stalks of the plant called rhubarb.

"In the month of May, when rhubarb is green, the stalks of the leaves are used as in the following proportions: Five pounds of stalks are bruised in a suitable vessel, to which is added one gallon of cold spring water; and after remaining in mash three or four days, the liquor or juice is poured off; when, to every gallon of this juice, three pounds of loaf sugar are added, and allowed to ferment for four or five days, in a suitable vat; as soon as the fermentation has ceased, the liquor must be drawn off into a cask, and allowed to remain until the month of March, when all fermentation will have finished; it must then be racked off, and more lump sugar must be added.

"In the month of August a second crop of rhubarb will be ready to gather for this improved method of making wine."—*British Champagne.*

I had, however, previously made wine from the rhubarb stalk, so long back as 1835, some of which I have even now in my possession, and of a most excellent quality. Not having heard of this patentee as a wine-maker, I conclude that he never made use of his patent right—if it was a right—for any practical or available purpose; and even if he had, his patent not having been renewed, is now expired. I therefore refer to it merely as a fact in the progress of the art.

The original gravity of Champagne may be made as low as 115 to 120, for which the weight of rhubarb stalks should be six pounds and a half to each gallon of water. This will give exactly one-half the quantity of pure juice, to that allowed for the Hock; but by using six and a half pounds of the stalk, instead of 13 to each gallon of water, the produce will be one gallon and a half, instead of two gallons, and the gravity about five. For example, if we make the standard 120, 115 must be made up with sugar and honey, which will be effected by using three pounds of sugar, and one-fourth of a pound of honey, to each gallon of mixed juice and water.

We assume the same quantity of Champagne is to be made as of Hock, but as we only propose to use six and a half pounds of rhubarb stalk, to each gallon of water instead of 13, more water will be required. 110 pounds of rhubarb stalk, will be necessary to produce eight gallons and a half of pure juice, and the quantity of water will be 16 gallons, making in all 24½ gallons; and the pure juice and water when combined, will give a gravity of about 5. As we propose the gravity to be 120, and have got only 5, 115 must be produced by 76½ lbs. of sugar, and about six and a half pounds of honey.

The process is to be carried on in a similar manner to that of the Hock, until we arrive at the casking. This operation is to be performed when the *must* has been reduced to about 100.

As Champagne requires as much of the carbonic acid gas to be retained in it as possible, it is only now necessary to state that the casks should be partially bunged down in the course of three or four days after they have been filled from the fermenting tub.

As the conducting of the various stages of the processes of this wine has been so fully explained in the British Wine-Maker, it is only necessary to refer the reader to that work.—See *Champagne.*

MADEIRA.

The directions which are already given for the production of Hock are applicable to the making of this wine, excepting that one gallon of cider is to be used instead of two gallons and a-half; and four gallons of Marsala, instead of half a gallon of Bucellas; and two pounds of sugar candy are to be dissolved in half a gallon of boiling water, and, when cold, added to the *must* at the time of racking. Consequently it will be necessary to put only nine or ten gallons of water upon the pressed pulp, instead of twelve.

CONSTANTIA.

The proportion of the rhubarb stalk for makking wine to imitate Constantia, is the same as that for Champagne, and the after treatment, as to racking, &c., similar. But five gallons of the deepest coloured Pontac wine are to be added, with four pounds of sugar candy, previously dissolved in half a gallon of boiling water.

This last mentioned wine is very superior when made with raisins as an auxiliary to rhubarb, in the same way as raisins to Green Ginger. See "British Wine-Maker," page 255.

RHUBARB WINE.

A very delicious cheap wine may be made from this plant without the addition of foreign wine. Six pounds and a half of rhubarb will be requisite to every gallon of water—the weight proposed for Champagne—but the *must* should be brought up to the same gravity as that for Hock, namely, 130; and to bring it up to this, it will require three pounds and a half of sugar to each gallon of juice and water. The after processes are to be conducted similarly to those of the Hock. At the time of fining, four pounds of sugar-candy are to be dissolved, and when cold added to it.

It may be remarked, to those who cultivate the rhubarb plant, that they will find the price of their wine to be about that of the sugar and sugar-candy.

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