THE

# BRITISH WINE-MAKER

AND

# DOMESTIC BREWER;

A COMPLETE, PRACTICAL, AND EASY TREATISE ON THE ART AND MANAGEMENT OF BRITISH WINES, AND LIQUEURS, AND DOMESTIC BREWING.

By W. H. ROBERTS.

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# PREFACE.

THE unambitious nature of the present publication makes explanation and prefatory remarks almost unnecessary. In detailing the results of my actual experience in Wine-Making, I have reason to believe, that I shall perform a useful and acceptable service to the public, or at least to a considerable portion of it; and the opinion of several individuals qualified to judge has confirmed this belief. The directions I have given are plain and practical. They are the result of patient and careful observation, and have stood the test of experiment during a series of years. They have also been conducted upon scientific principles, and with the aid of an instrument too little known, the Saccharometer, the uses and value of which, in domestic wine-making, form a prominent part of this treatise. The approved quality of the wines which I have made, some of them now fourteen years old, was another inducement to lay my methods of procedure before the public. A yet stronger motive was the hope of calling the attention of society, at this particular time, to liquors at once more delicate and harmless than the drinks in common use among the middle class in this country, and of thus lending my aid in promoting the diffusion of a better taste, by the introduction of cheap, healthful, and exhilarating vinous liquors, instead of ardent spirits, or their deleterious compounds. Should I have the gratification to find, that my little work has in any degree been promotive of so desirable an object, the trouble which I have bestowed upon it will be much overpaid by the consciousness of having contributed a small mite to the sum of the innocent comforts and pleasures of society, while aiming at its moral improvement.

It may be proper to mention, that this little work was ready for the press a twelvemonth ago, as the author understands, that another work on Wine-Making has since appeared, in which the Saccharometer is described, though no directions are given for its application in practice.

EDINBURGH,
Jan. 24. 1835.

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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 obtain uniformly a cheap, wholesome, and well-fermented wine from the fruits of this country. On the contrary, the receipts in these works are, generally speaking, nothing more than theoretical fancies; and by following any of them, should he meet with success, he will owe that success to chance alone.

Having been for many years endeavouring, by experiments, to make good British wines, and having derived much valuable information from the theoretical works of Dr Macculloch and others who have written on the subject, I have been enabled to produce wines of such a quality as fully compensate me for the trouble taken.

The Caledonian Horticultural Society having considered the manufacture of home-made wines a subject worthy of their attention, had been in the habit, for some time, of giving medals as premiums annually, to those who produced the best wines made from the fruits of this country. The importance 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 before to persist in my pursuit. The following year I again sent five different wines for competition, when I was rewarded with another medal.

I was requested by the Secretary to give the Society a detailed account of the process I adopted in the manufacture of 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 makers of home-made wine. What I wrote met with their 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."

My reader may well believe, that after this encomium from so highly respectable and scientific a committee, my zeal was heightened 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 have been solicited to lay before the public the result of so many years' experience and experiment. I am aware, however, of the difficulty which meets me at the very commencement, namely, the existing prejudice so commonly entertained against home-made wine in Scotland; for in England, although it may be found at the tables of the rich as well as of the middling class, this prejudice still exists with the former only, but here it is so strong, that this wine is scarcely tolerated, and where it is, it is but presented to children. In palliation of this, it may however be said, that in this country (Scotland) there is a different cause for the bad reputation home-made wine has obtained; for nearly nine times 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 should do, prove detrimental to the exercise of the digestive functions. 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 better. It may be asked, why are home-made wines more used in the South than in the North? In England they are better manufactured, and consequently must be better wines. 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 applied to use 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 the stages of its manufacture. 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 so worthy of occupying. Before I enter more fully on the subject, perhaps it may be advisable to say a little about wines styled Foreign, and drunk as such, but 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. 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 off 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 large vats for the purpose of similar fabrications. Beni Carlos wine can be purchased, including duty, for L.38 *per* pipe, Figueras for L.45, Red Cape, L.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 propor-

* Wine and Spirit Adulterators unmasked. Robins and Co. 1 vol. 12mo, 1829.

tionate 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 |
| 1½ Pipes of Red Cape, | 137 — | 32 — | 91 — | | 48 | 3 | 6 |
| 1½ 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: 2½ 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. The wines of Madeira are in like manner adulterated, 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 itself 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 miscalled 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 drunk without hesitation, and without any discovery of the cheat."

Champagne is the last wine I shall quote from this author. He observes regarding this wine, (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 wine-makers 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 drunk 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 wines commonly drunk 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 bring forward the assertion of many more authors to prove 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, purchasing and drinking for genuine wine such adulterated and unwholesome mixtures, where, in many cases, even poisonous ingredients are unhesitatingly made use of. To establish the accuracy of the foregoing statement regarding these vile, dishonest and illegal practices, I shall confine myself to 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 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 employed 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."

These sad pictures 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 these pipes 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 do really believe that genuine wine may still be got by going to a respectable merchant, and giving him his price, instead of purchasing from those who advertise Good Old Port at 20s. to 24s. *per* dozen.

Now, no one will venture to assert, that a medley so compounded as we have before noticed, can be so palatable, wholesome, or economical as a well-manufactured, well-fermented British wine, made under our own superintendence. As this is truly the case, it ought to be a matter of great consideration not to run the risk of being poisoned by the one, when we have it in our power to obtain the other genuine and generous, 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 shew how little truth there is in the assertion, or rather how utterly devoid of truth it is, and how much ignorance there is displayed in making it, I shall take the liberty of relating the following anecdote, vouching for its authenticity. 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. 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, among 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, he 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 right 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, another most delicious, and so on. None 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 it was the very best Constantia he had ever tasted. The second pint was uncorked, and equally enjoyed as the first. This 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 it. Surely after this no one will now be found to start the question, Is it possible, or is it not possible to make a good wine in this country? 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.

Nor do I find this a singular case. Other judges have been deceived with wines made in this country, when drunk at the tables of their friends, as those were who dined at my friend's table. 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 Pois 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 now in my cellar thirteen different kinds of wine, all my own making, being about twelve 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, they will go on improving in quality for many years to come. Indeed, they seem less liable to destruction from age than foreign wines of the same strength. 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 it will be practicable when made in a large one, and the wine will be in every respect greatly superior; for the nearer we approach the attenuation of the sugar held in solution, the nearer we approach to the making of a perfect wine. But of this, more hereafter. Another inducement for making wine in a large quantity is the economy of it. Providing the fruit season is favourable, and the sugar reasonable, 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 small. Even should we have been so improvident formerly, as to have remaining only the manufacture of one year, still we can afford to delay an operation for another season.

The nature and quality of our fruits calculated to make wine have been ably demonstrated, and rules laid down on the complicated process of fermentation, by Dr Macculloch in his admirable work. Little remains therefore for me to say. The truth of his assertion 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 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 the making of wine. The grape, as if alone intended by Providence for wine, on the other hand possesses all the requisites, and 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, 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 despair not of this acquisition being made. 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 even it has grown cold on the subject. But more especially does it surprise me, that the Highland Society of Scotland has entirely overlooked this matter; a society that 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, 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*, *29th 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 most obedient servant,

(Signed) " Gilbert Innes."

I do not wish to endeavour to make my readers sur ... y of our fruits (grapes excepted) r ... 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 wines equal to those of the foreign grape, but to make a perfect, wholesome, and delicious wine, at four or five hundred *per cent.* under the price of the miscalled "*Good Genuine Port or Sherry*," or eight hundred *per cent.* under the price of *the delicious home-manufactured 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 to pay little or no attention to the fermentation, as before stated, which is the most essential part of the process. General rules may be laid down, but not as fixed rules, 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 a full (but erroneous) method of making many kinds of wine. By following any of the rules laid down in such books, it will be pure chance if you are successful, as it is ten to one that you produce a drinkable wine. This is the sole cause why our home wines have got so bad a name.

The makers of these receipts have never taken into account, that a warm dry summer will produce fruit with one-fourth more saccharine matter than a cold wet one. Neither do they consider, that there may be a difference of 10, 15, and 18 *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 objects of this treatise, is to lay down a simple method to guide the operator in judging of the value of his fruit, as well as of his sugar, before and after fermentation; to enable him to conduct the process with comparative ease and satisfaction to himself, and to secure a favourable result. The chief object he has in view, is to convert the sugar of the fruit and the sugar employed, into spirit, which he will be enabled to do, as far as is possible in so small a body. 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 shew the gradual or rapid 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 wine-makers, 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 they may serve as guides to them in their future operations. It must be obvious to every reflecting mind, that without a knowledge of the fermentable matter one has to work upon, all attempts to obtain uniformity of wine must be unavailing. As I must of necessity give a description of the saccharometer, with the mode of using it, I shall, at present, confine myself to a short sketch of this instrument, with the indications, and their results.

The saccharometer is an egg-shaped ball, balanced below, and terminating above in a triangular stem; on each side of which there are cut ten divisions. The sides are distinguished by the letters A, B, and C. A tin-plate cylinder for holding the liquids accompanies it. When the cylinder is filled with pure water at the temperature of 60°, and the saccharometer put into it, the instrument sinks until the whole of the graduated stem is below the surface. When the saccharometer is put into the syrup or juice, or into the compound, it does not sink so low, because these liquids are heavier than water; and as their weight increases with their strength, it is obvious, that the stronger the compound is into which the saccharometer is put, the less it will sink. The cut divisions on the stem of the instrument indicate the specific gravity of the liquid under examination, or, which is the same thing, the excess of its weight above the same bulk of water. The weight of water always being represented by 1000, as a cubic foot of water weighs 1000 ounces or nearly so, at 60° of temperature; therefore, any number on the instrument which the surface of the liquid cuts, shews that that liquid is that number of ounces heavier than water.

I have used this instrument upwards of twelve years, without the aid of which I have never 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 40, and sometimes not above 35.

Such a gravity as any of these, without the assistance of sugar, will be greatly insufficient to make a fermented liquor, except of a very meagre description. Some people who have not sufficiently 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 found out, from the failure of many experiments, that it is absurdly erroneous, a mere chimera; and the result has been to convince me, that the more sugar that is used not exceeding $3\frac{1}{2}$ lbs. to the gallon of juice, the more generous will be the wine, and the longer it will keep, provided the attenuation be complete, which I may say is impracticable where the quantity made is small. The more sugar employed, the less water must be added to the juice; for the absolutely necessary 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, the wine disagreeably sweet, sickly, and without sprightliness, completely destitute of the vinous nature which ought to be its characteristic. Hence much of the prejudice against [illegible] is not without foundation.

[illegible] to be drawn from these cir- [illegible] hat 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, 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, the liquid will be reduced to 30. Let us fix, then, this weight 30 for our standard, whether the season be favourable or not. In a good year equal portions of pure 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 this instrument, *i. e.* the saccharometer, we are taught the value of the juice. We have now to apply it, in order to ascertain the value 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 from 35 to 36½. We will assume here the gravity only at 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 only 2 lbs. 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 be added or not at pleasure. The saccharometer will also 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 spirituous, and therefore the lighter in gravity. The progressive effect this instrument will clearly demonstrate, until the *must* 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 now in practice, (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, as spirits decompose and displace the carbonic acid, and prevent the wines being lively and brisk, which should be the character of home-made wine.

Some add spirits for the purpose of checking fermentation, or preventing the wine 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 in the manufacture. Would those who make wine, and think it will not be good without the addition of spirits, give their *must* a small increase of pure juice and sugar, reducing those extra allowances with skill and attention, and 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, on the manufacture of Wines; the Second, on Liqueurs, &c.; and the Third, on Private Brewing. Brewing is a science, I may say, I have studied the greater part of my life, having been brought up in a brewery in England from my infancy. Since that period I have been a managing partner in a brewery in Scotland for several years. Therefore, the methods I shall propose as guides to those who brew their own ale, &c. will not be theoretical fancies, (as are most of the works on this subject at present before the public,) but well-digested realities both in theory and practice. 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, &c. with ease, economy, satisfaction, and success. In the treatise on Wine I shall enter more into the detail of some wines than of others, especially of those of 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 employed into a vinous liquid by a consistent attenuation. This evil is one of the principal causes, if not the only one, of our native wines being a heterogeneous mixture of undecomposed sugar, spirits, and other ingredients, which enter into their composition; and, by attention being paid to its removal, a delicious vinous beverage would be obtained.

Champagne and grape wine are more enlarged upon than any other. 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 *must* from malt more beneficial and economical than any other basis, especially when beer is made from the good still remaining in the malt, after a sufficient quantity of *must* 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 will give, much fermentable matter still remains,—nearly one-third. 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 110, 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 23 or 24 lbs. of the best Jamaica sugar. Good malt is generally about 6s. or 7s. a-bushel, sugar 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 impostors, who adulterate foreign wine, or altogether imitate it.

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.

So far have I carried my reader in my introduction, and I trust not without profit to him. I now beg him to follow me through the modes of manufacturing a variety of wines, and hope he may 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 the 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 very ancient invention, and is said to have been in use as far back as two hundred years ago. It appears, however, that its use was not much 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," &c. Quin, Richardson, Dring & Fage, Diccas and others, followed Martin. Since that time many saccharometers have been constructed, each claiming a superiority over the other. But Dr Thomson, who was one of the three selected by government to inquire into the differences in value between the English and Scotch barleys and malts, in his report, has shewn, that these instruments are almost all mathematically incorrect; and has invented one himself, which is made by Alexander Allan of Edinburgh. The before-mentioned instruments, especially that of Diccas, are made to shew the number of pounds of extract contained in thirty-six gallons of water, each pound of which extract occupies the space of .06 part of a gallon of water.

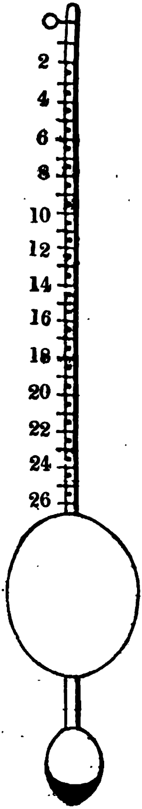
Dring & Fage's shows merely the addition of gravity caused by the weight of sugar put into a full barrel of water containing 36 gallons, and the difference between the weight of the sugar and the weight of the water so displaced. For example, suppose we have a barrel of water weighing 369 lbs., at the 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 as much of the water as 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 original 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 be 321 lbs. instead of 369. By adding the above quantity of sugar, 78 lbs., the excess of gravity will be 30 only instead of 78, so that a barrel of wort weighing 30 by Dring & Fage's instrument, weighs actually 399 lbs., namely, 321 lbs. water, and 78 lbs. 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 shewing 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."

Regarding the saccharometer invented by Dr Thomson, it is so contrived as to show the actual specific gravity of the liquid intended to be valued; and as in all saccharine liquids exceeding the degree of heat of 60, the gravity will be lessened, and, on the contrary, if colder than 60°, the weight will be proportionably increased, a thermometer and a sliding rule accompany the instrument, for the purpose of exhibiting the strength of the extract at any required temperature. This is very desirable; for to wait until the extract cooled down to the standard degree of heat, 60, would be very tedious, especially in brewing. To those of my readers who are anxious to excel in wine-making, I would strongly recommend the purchase of this instrument, assuring them it will pay itself in two years, especially if, in addition, they brew their own ale. I need say no more respecting this instrument, as a book containing every instruction of its use and application is given with it; but those who would be unwilling to sacrifice the sum of three guineas, its price, may be accommodated with a glass hydrometer, manufactured by Mr Dun, Optician, Edinburgh, at the small price of six shillings, which will shew the gravity as well as Dr Thomson's, as far as it goes, to 130, 10 above my proposed standard, only that all liquids under examination must be reduced to 60° of heat. The accompanying figure will, along with the following explanation, assist my readers in comprehending its use. It consists of an egg-shaped ball, balanced below, and terminating above in a long tube, which contains 26 divisions, from 1 to 26, No. 0. the weight of water. Each of these divisions shows 5 of gravity. There are between one division and the other, 3 degrees, each degree shows the intermediate gravity, so that by multiplying any number, which, on examination, the liquor cuts, by 5, you will find out the gravity of the wort. For example, should the liquor raise the instrument to 26, the last number on the stem, by multiplying 26 by 5, it will be 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.

Specific gravity is the absolute weight of different bodies of the same bulk. Now this bulk has been fixed at a cubic foot. 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 instrument is put into the cylinder filled with pure water at the temperature of 60°, it will sink to 0, on the glass stem; 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 under examination is, the more it will sink.



## SPECIFIC GRAVITIES.

The following are the specific gravities of pure juice of some of our fruits, taken in favourable years. I have also given the gravity of a pound weight of different samples of raw sugar, honey, raisins, held in solution with one gallon of water, at the temperature of 60°, in order that my reader may have a compass to steer by, in bringing up his gravity to the standard, as well as to increase or diminish it, as necessity requires.

| | | |
|---|---|---|
| Pure juice of red currants, | highest gravity, | 60° |
| white do. | do. | 56 |
| black do. | do. | 56 |
| do. do. | do. | 50 |
| red do. | do. | 51 |
| do. do. | do. | 45 |
| apples, | averages, | 46 |
| pears, | | 49 |
| $\frac{2}{3}$ ripe gooseberry, | | 36 |
| $\frac{2}{3}$ oranges, January, | | 49 |
| $\frac{2}{3}$ lemons, | | 38 |
| foreign grapes, brought here in jars, green, | | 70 |
| do. do. | black, | 68 |
| 1 lb. of good Malaga raisins in one gallon of water, 21 days, | | 18 |

| | |
|---|---|
| 1 lb. of good Malaga raisins in one gallon of water, 21 days, | 16° |
| 1 lb. good raw sugar dissolved in 1 gal. of water, | 36½ |
| 1 lb. do. do. do. second sample, | 35 |
| 1 lb. do. do. do. third sample, | 30 |
| 1 lb. refined do. | 36 |
| 1 lb. Scotch honey, | 30½ |
| 1 lb. foreign do | 29¼ |
| 5 lb. parsnips, boiled in one gallon of water, | 15 |
| 5 lb. beet root, do. do. | 14 |
| 1 lb. treacle dissolved in one gallon of water, | 30 |

1 bushel of good malt, equal from 20 to 24 lb. of sugar.

## WINE MADE FROM UNRIPE GOOSEBERRIES, IN IMITATION OF CHAMPAGNE.

There is more of this wine made from our domestic fruit than any other in this country, owing to its resemblance to Champagne; and as it appears to be more in general use than any other, it is my intention, not only to give my reader the result of my own experience in the manufacture, but that of others; as well as to lay down the mode the French adopt in the treatment of fermentation, racking, sulphuring the casks, and other means necessary for producing this peculiar wine. One of the best methods of manufacturing this wine which I have found, I will be very particular in describing. At the commencement I use only one part of water and three of berries. An imperial gallon of fruit, when heaped, weighs 10 lbs., it may be less. To avoid unnecessary calculation, it may be as well to assume, that an English pint of fruit will weigh 1 lb. as well as an English pint of water: really an English pint of water weighs upwards of 1¼ lb., but this difference is of little consequence, as it is by measure and not by weight we proportion the fruit and water. To make a fifteen gallon cask of this wine, you will require 22½ gallons of gooseberries, as the fruit does not produce much above one-third juice; the 22½ gallons of fruit consequently will only produce 7½ gallons of juice. It is always advisable to make a two gallon cask more, for the purpose of supplying the deficiency which will necessarily arise from racking off the large cask, so that, instead of filtering the grounds from the large cask, and returning them into it, you will fill it up with fine wine from the small cask; afterwards filter the grounds, and fill up the small cask with them. These additional two gallons will require extra fruit in proportion. This method of employing two casks I would strongly recommend, both for this wine and for every other. The water and the berries are not all to be mixed up at once; three tubs are to be employed on this occasion, one for the berries, a second to bruise them in, a third to receive them when they are bruised. One gallon of the berries is to be bruised at a time, in order that every berry may be broken, which can only be accomplished when done in this manner, but would be almost impracticable were all the 22½ gallons together. Those bruised are to be removed to the third tub, and one-third of a gallon of water is to be added, and so on until the 22½ gals. are bruised, *i. e.* after each gallon of bruised fruit one-third of a gallon of water is put to it, until the 22½ gals. of bruised fruit are emptied into the third tub, and the 7½ gallons of water are added. This refers only to the making of fifteen gallons, not the fifteen and the two gallons. The mass is then to be well mixed, a portion of the liquor to be taken out for examination by the saccharometer, and the specific gravity noted in a book for the purpose, which it is probable will be from 17 to 18 on the instrument: the tub to be then covered up. The next morning the mass is again to be well agitated with a stick, and a second examination noted. The gravity will not appear to have increased much, but as long as it does increase, the liquor must remain on the husks, as fermentation has not yet commenced. There is no certain time you can say that this will begin, sometimes in ten hours, and sometimes not until three days. The instrument is the only sure guide, for as soon as you perceive a decrease in gravity, you may rest assured fermentation has commenced. The husks must then be removed, after having been well pressed with the hand, and the liquor strained; but as they still contain some good, two or three gallons of water are to be poured on them; they may be again squeezed and strained, and this second liquor added to the former, which should not be less than 20 gallons, if the 15 and the 2 gallon casks are to be filled. The second tub, which was employed for bruising, is to be washed, the whole liquor measured into it; the gravity is again to be found, for the purpose of ascertaining how much sugar will be necessary to raise the *must* to the standard gravity. We shall suppose that the compound has now been reduced to 15 by the additional two gallons of water, and our standard gravity being 110, we require 95,—and that must be made up by sugar. By mixing 1 lb. of good refined sugar in every gallon of the juice and water, an increase of gravity will be observed to the extent of 36 at the temperature of 60°. By adding a second pound to each gallon, a farther increase of 36 will be observed, making 72, being still deficient 23 : $\frac{5}{8}$ lb more will be required, which will make an increase of 22½, and which will bring the *must* up to 109½ *. I have been in the habit of using, instead of 2$\frac{5}{8}$ lbs. of sugar to each gallon, 2½ lbs. of sugar, and ¼ lb. of virgin honey. 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 besides the excess of gravity, will not be so much as the same weight of sugar; but the honey adds to the wine a soft and mellow flavour, which makes it more resem-

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| | |
|---|---|
| * Juice and water, say - - | 15 |
| 2 lbs. sugar, at 36, - - - | 72 |
| $\frac{5}{8}$ do. - - - | 22½ |
| | 109½ |

ble the real Champagne. The whole being put together, and thoroughly agitated, for the purpose of melting the sugar and honey, we must cover up the tub with a blanket; and this agitating during the first day must be repeated every two hours. After the last agitating, a portion must be taken out and examined by the instrument, and recorded. Every morning and evening, this operation of agitating and examining must take place, until the gravity has been reduced to 80. It is then to be strained through a fine sieve, and put into the casks, one of fifteen gallons, the other of two, and the remainder, which may amount to half a gallon, or a little more, kept to fill up the casks, which, for the first three days, must be done every three hours; a dish having been previously put under each cask to receive the scum the wine throws out during fermentation. The fine of it is not to be thrown away, but kept for the purpose of assisting to fill up the casks. A sample of the wine must be taken out every third day, for examination by the saccharometer.

Now I have brought my 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 it 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 spirit of wine, or excellent aqua vitæ.

"When the isinglass is grown soft, they handle it well, to divide it and distribute it; then, when the parts begin to separate, they put in 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

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

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 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 thewine 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 gave it a frizure, as they call it, and put in it one-third part of ordinary isinglass.

"The most experienced persons shift their fine wines 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 it 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 glass 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 a ropy wine, if he shake the bottle 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 in 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 to 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 is 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 then 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 anywhere else so 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 you what Dr Macculloch's views of gooseberry wine are, page 187. "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 pound 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 that 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 chemical 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 can only 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 tightly put down, and ultimately tightened, a spill 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 hey 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 my reader with his *must* in the cask. I have recorded the mode which the French adopt when their *must* for Champagne has been brought ~ same crisis; 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 effervesce, it ought to be bottled off before the April following, otherwise it will, nine times 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, therefore it 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 after the former receipts to run from the vinous to the acetous fermentation, because the quantity of saccharine matter so much exceeds the natural leaven of the fruit, in consequence of the 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, *i. e. must*, from the grape, is between 1058 and 1100, or, in my language, 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 would be so syrupy, as to be incapable of being sufficiently reduced to a desirable attenuation, without other 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, bringing the gravity up to 218 or 220, 100 more than my standard. How any one managed to reduce this sugary extract to any thing like a consistent attenuation, I am at a loss to know.

I once made a wine of this imitation 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: Therefore, instead of wine, it would be for twenty years a perfect syrup; and, without a very large portion of spirits was added, it would be in a continual ferment.

The grand point is to endeavour to find out what quantity of the juice of the gooseberry will be necessary to attenuate one pound of good refined sugar to *zero;* that is to say, how much pure juice will be requisite to put into one gallon of water, sweetened with one pound of refined 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 be regulated in this part of the process with the greatest nicety. As the gooseberry does not impart to the wine any flavour, but that of 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 my reader, to what degree the *must* should be reduced, and how this reduction is to be accomplished. It was 80 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 whisky, and as every part of the interior needs to be wetted with the spirits, a fifteen gallon cask will require two bottles. The whisky, after wetting the cask, is to be allowed to remain in. 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 whisky. 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 see need, and then put them in firmly.

This process of the first fining and racking, I generally perform in the month of September, the same year 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 making up the deficiency by the loss of lees from the little cask, as on the former occasion. If the wine is not very fine the second racking, I add half a pint of finings, (the method of making which, I shall hereafter shew,) and bung both casks down, previously having taken out a portion for examination, when most probably the gravity will be found reduced to 30. I have never found this kind of wine reduced lower in gravity than 20; and at this reduced gravity, I have noticed it was not sufficiently effervescent to resemble the wine it was intended to imitate; but at 30 it almost invariably bore this characteristic, when made with the proportion 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 way already described. None must be used in the second. A twenty-fifth part is an over abundance. I have found little or no difference in the wine, in consequence of bottling it before the spring following, but much difference if not bottled before the month of May. It is almost as sure to effervesce if bottled before the spring, as not to effervesce if 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 silent. I lose no time after the second racking in November, if it has attenuated to 28, and if it is beautifully clear, to bottle it. When bottled and well corked, I put it into a cold cellar, laying the bottles horizontally on sand, 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 on sand the beginning of winter, and again placed upright the following April.

By following these methods, I doubt not my readers will be encouraged to make a second quantity of this wine on a larger scale, assured they will be amply compensated for their labour. I have now 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 my reader my mode of procedure before casking, — at casking, — 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 wines which can be made nearly perfect, so much so indeed, that when properly attended to, they may pass for a foreign manufacture; I therefore intend to give not only my own mode of procedure in the manufacture of those wines, but the methods adopted by others, where they do not materially differ from mine, recommending the saccharometer, and pointing out the nec[illegible]s use, as the only compass by which [illegible] afety. The following is Dr Mac-[illegible] t for Gooseberry Champagne.

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

"The fruit must be selected before it has shewn the least tendency to ripen, but about the time when it has nearly attained 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. 40 lbs. of such fruit are then to be introduced into a tub carefully cleaned, and 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 wâter are then to be 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 *marc*, for the purpose of removing any soluble matter which may have remained behind. 30 lbs. 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 surperfluous 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 ntation 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 excess or 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 farther 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 farther 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 remanufactured 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 into a sulphured cask, when it must be fined and bottled in the usual manner. Such dry wines are occasionally disagreeable to the taste for 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 2 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 tint will be a flesh colour; for the red colouring matter is precipitated during the process. The following will not afford quite so good a wine as from unripe gooseberry; 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 canvas 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 up 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 the first in quality and character of all domestic wine; and if a complete fermentation has been regularly conducted, from a well-tried standard of specific gravity, a wine not inferior to foreign will be obtained, especially when the grape is not spared, and the season propitious. For making this wine in a plentiful year, fifteen pounds of grapes to each gallon of water are used. The grapes, after being picked from the stalks, are lightly broken with the hand. When carefully pressed, the water to be used is well mixed in with the fruit so bruised, a sample 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 is shewn. 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 is 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 strained from them, and added to the former. The whole quantity is then 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 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, 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, to be made up by sugar. As 1 lb. of sugar dissolved in a gallon of water is equal to 36, therefore, to make up this deficiency of 70, 2 lbs. of sugar to each gallon of jüice and water will be required; and this will give an increase of gravity from 50 to 122.

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

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 30 or 35.

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 performed 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 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, 1 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 improves grape wine. In this case, however, it is necessary 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 Honourable 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 cán 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 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 expansive 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, 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 2 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 Bursac, and the lighter of the Bourdeaux wines. An increase of sugar to 3 lbs., 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 3 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 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 shoots, 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 purposes 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 have thus 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 reproduced 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 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,

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

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 as 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 a 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, 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 from 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, squeezing the latter. 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 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 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 fermentation will be vigorous. The after management to be exactly the same as in the wine made from the unripe grapes, quoted from Dr Macculloch.

## RAISIN WINE.

Raisin wine resembles foreign wine more than any other made in this country. Especially does it resemble those wines made in Italy, Cyprus, &c. where they boil their *must*, that is to say, if it is well fermented; and it cannot be distinguished from those wines by the most competent judges.

That such is the case cannot be at all surprising to the reflecting mind, when we examine minutely the material of which it is made.

Raisins are nothing more than grapes, differing only from the latter, by being deprived, by evaporation, of the water they contained, and a portion of their acid converted into sugar by the sun's influence. Now, by restoring those necessary ingredients for wine-making, water and acid, we have materials to work upon, quite as good as those in the grape; and we have more sugar in the raisin to increase the gravity, with a sufficiency of natural leaven, to decrease it.

There are various methods of manufacturing this wine, the best of which I consider, is the following one, which I have adopted for several years with perfect satisfaction. Before proceeding farther, I may just mention by the way, that thousands of pipes of raisin wine are made annually, for the purpose of adulterating the foreign wine.

The raisins which I use for wine-making are those which are imported from Malaga, in baskets of 56 lbs. weight, the price varying from 36s. to 45s. *per* cwt. The very best of that class of raisins should alone be used.

Instead of using all Malaga, an equal portion of Muscadine with Malaga will improve the flavour, but add greatly to the expense.

This wine is capable of being made either a sweet or a dry wine, at the option of the operator.

The most disagreeable part of the process is separating the raisins from the stalks; a process however absolutely necessary, for were they allowed to remain during the time of steeping, they would impart a disagreeably astringent flavour to the wine. There is a sufficient quantity of yeast, *i. e.* natural leaven, existing in this fruit, to cause spontaneous fermentation, and render it complete without artificial means. To make 15 gallons of this, (which is far too small a quantity to be profitable, and to render fermentation complete, especially for a dry wine,) 75 lbs. of raisins will be required, 5 lbs. of fruit to each gallon of water. Strip them from the stalks, and put them into a barrel of 36 gallons measure, the head of which has been taken out. Each 28 lbs. raisins will imbibe nearly 2 gallons of water: therefore, to make 15 gallons you will require about 20 gallons of water. In the first instance, 15 gallons of water heated to 90°, not exceeding 100°, are to be put on the fruit; the stalks are to be put into the extra .5 gallons of water, for the purpose of depriving them of any sugar which may hang about them: after the stalks are well washed, the liquor is to be strained, and added to the 15 gallons in the barrel; the whole to be well stirred up and allowed to remain. The operation of stirring and bruising the fruit must be carefully performed every morning and evening, for 15 days, more or less, according to the weather: a sample of the liquor should be taken for examination by the saccharometer at each operation, and the gravity recorded; for as long as the *must* increases in weight, fermentation is gradually extracting the good from the fruit. When all the good has been extracted from the fruit, the gravity will cease to increase; the *must* is then to be strained from the raisins. The first morning after putting the water on the fruit, on examining the liquor by the saccharometer, you may find the gravity 30 or 33, the second time between 55 and 60, the third, 70 to 75, and so on gradually until it arrives at 105. At the next examination you may find, that instead of exceeding the 105 it has fallen to 100. The *must* is now to be separated from the raisins, as they are no longer in the smallest degree beneficial or advantageous to it. This separation is effected by squeezing the raisins with the hands through a fine sieve, placed over a tub for the reception of the impressed juice. This tub must be carefully looked to, that it be of sufficient size to hold the whole of the liquor. The husks are not to be thrown away after being squeezed, but put into a tub and washed with two gallons of water, for the purpose of extracting any good that may yet remain in them. In this tub they must be left for twenty-four hours, then repressed, and the strained liquor added to the former. The barrel in which the raisins were steeped is to be properly washed, and the whole of the impressed juice measured into it, where it is to ferment; a portion must be taken out for examination. As you will now find the *must* will be under 100 in gravity, in consequence of the additional water, you must add sugar until you bring up the gravity of this *must* to 135; which I have found the best gravity for this kind of wine. Even 120 will make very good raisin wine. To raise it to 135, it will require at the least one pound of sugar to each gallon. The whole must now be well mixed, that the sugar may be completely melted. If the weather is cold, the barrel ought to be placed in a room where there is a fire, that the cold may not check the fermentation. The process of stirring and examination is to take place 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 90; but, as I said before, this will in a great measure depend upon the warmth of the room, and the punctuality of well mixing it. When it has fallen to the point of gravity 90, it may be put into the casks for final fermentation. This operation will tend to check it; but to avoid danger, I would advise the casks to be washed out with boiling water, and the *must* put in while 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. Should the *must* remain in this dead state for twelve hours, a small portion (three table spoonful) of good thick brewers' yeast should be mixed with a quart of this *must* heated to 80: this heated *must* and yeast must be put into a vessel capable of containing two quarts, as it will expand. In about an hour after, this will be the case, with a lively fermentation: at this period it must be put into the 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; when it requires checking, as this evil is attended with more danger to the wine than the former. The necessary mode for which purpose, I shall take occasion to notice hereafter.

*Casking.*

The casks should be so placed with the bung hole off the perpendicular, as to allow the scum or yeast which the fermentation throws up, an easy descent. 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 it. All the time the *must* is fermenting in the casks a dish should stand under each (if two are to be filled, as before recommended) to receive 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 it up according to receipt, at a fixed period, put it in 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 partly so; and instead of the contents being wine, it is too frequently found to be moulded vinegar. Those who are conversant know, that even from this period, increasing attention and skill are requisite, to direct them to avoid the extremes of attenuating too much or too little. There can be no doubt, that the precaution used at the commencement of this intricate stage—so I may well call it—determines the early or late period of natural fineness, the wholesomeness or unwholesomeness of the wine, and creates from the same materials a distinction 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 90, the *must*, (being properly now called wine, as it is vapid and void of sweetness,) should it ferment too rapidly, which is easily known by the excess of heat and the too rapid decrease of gravity, must be racked from its lees in order to check the violence of its fermentation; otherwise it would proceed from the vinous to the acetous, and vinegar would be the produce instead of wine. By this operation you deprive it 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 while any portion of this remains, fermentation, visible or in-visible, 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 cask well washed, slightly sulphured, and two bottles of whisky put into it. The cask is now to be shaken, so that the whisky shall wet every part of the interior; the fine wine is to be returned into the cask, after a portion of it has been examined; 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 cask. 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, which must remain, until, by the saccharometer, you ascertain that the gravity of the wine is reduced to 30 or 35. At this period it should be fined and bunged tight down, after having made a spill-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 if ever the case,) it must be racked again, and treated as before; *i. e.* sulphuring the cask, &c.; and the wine is again to be fined and bunged tight down, the spile to be left out for a day or two, and then to be placed firmly in: the spile may be taken out at the expiry of a week; and should the appearance of fermentation be subsided, the gas will escape without any froth rising. If the contrary is the case, and froth does arise with the escape of the gas, the bung must be taken out, and the cask filled up with whisky; the bung is then put tight in again, and the spile left out for a few hours. When this wine is made from Malaga raisins, 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 object will be obtained, as well as the wine improved in richness and flavour. I have also found, by the addition of Argol or crude tartar, 1 oz. to each gallon of *must*, with 3 oz. of salt to 15 galls. after the operation of pressing, having been previously dissolved in a small portion of heated water to 180, and put in two quarts of the *must*, that the wine is greatly improved. Indeed, the addition of crude tartar to every home-made wine, in this or in a less degree, is beneficial; but as I intend to enter more fully on the properties of this acid in another part of my treatise, it will be unnecessary to dwell upon it at present.

This wine should remain in the cask as long as possible, and at the earliest should not be bottled until after the following spring; but if allowed to remain in the cask a few months longer, even to 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 wine resembling Mountain.

## DRY RAISIN WINE.

To make the same quantity of wine as in the former receipt, 3 lbs. of raisins additional to each gallon of water, making in all 8 lbs. of raisins to each gallon of water, ought to be used. 7 lbs. would make an excellent wine, but 8 lbs. will be greatly superior. The fruit is to be stalked, steeped, and treated exactly in the same manner, as in the former wine; the *must* examined as frequently as before, and noted. This *must* requires no sugar. It does not require any difference in the process, except reducing its gravity, before being casked, to 65 or 70, or as nearly as possible to one-half of its original gravity, instead of 80. 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 must 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 a small quantity of 15 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 or 20 instead of 30 or 35. If a quarter of a pound of virgin honey is added to each gallon of this *must*, 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,) it will give to the wine a delicious mellow flavour.

## CURRANT WINE.

Currant Wine has been gradually growing out of repute, until it has at length a very bad character; and I greatly fear that all I can say in its favour will not induce the reader to cultivate the making of this wine; especially if he has not got a superabundant supply of currants in his own garden. To those, however, who have this abundance, I now address myself, assuring them, that by close attention to the following formula, they will not be ill rewarded; as they will be enabled to make a delicious wine at a very moderate expense. The currants must be dead ripe; for the riper the fruit is, the less malic acid it contains, and the less sugar it requires. They must 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 tó 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; in all 23 gallons. 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 with a stick, a portion of the juice taken, examined by the saccharometer, and noted; the mass is allowed to remain until, by the saccharometer, a decrease of gravity is ascertained: at this period the juice is strained, squeezing particularly well the husks, which latter are put into a separate tub, and two gallons of cold water thrown upon them to extract the remaining good. The pure juice is now measured, and a sample taken to be 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. Should, on the contrary, the gravity of pure juice be only 50, (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 dictates. The water used to be mixed with the pure juice is cold spring water, and that which is strained from the husks. Taking it for granted that there are now 20 gallons of *must*, 15 for the large cask, 2 for the small, and the remainder for filling up, &c. I proceed. My reader will now wish to be informed what quantity of sugar to each gallon of juice and water, gravity 30, will be required to bring up the *must* to 120. By referring to the table of specific gravities, he will find that the average gravity of sugar, adding 1 lb. to a gallon of water, at the temperature of 60 degrees, is 36. Consequently, the addition of 1 lb. sugar to each gallon of juice and water, whose gravity is 30, will bring it up to 66; a second pound to each gallon will bring it up 36 more; this added to 66 will make it 102: an additional half pound to each gallon will bring it up 18 more, making the standard gravity 120. The sugar is properly dissolved, which takes some time; and when completely so, the *must* being now in the fermenting tub, a portion is taken, weighed by the saccharometer, and noted, and if deficient in gravity, made up as in other wines already mentioned. One-half pound of crude tartar 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 having been broken in the head or froth which fermentation causes to rise to the surface, 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 70. This, because of the quantity being so small, is not so easily accomplished. The *must* now being at 70, is casked in the same manner as already mentioned in other wines. 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. Every inducement is used with this and every other wine to encourage a vigorous fermentation, especially in so small a quantity; as so small a body cannot of itself retain sufficient heat to excite the fermentation necessary for a consistent attenuation. If not sufficiently attenuated, a portion of the sugar will remain undecomposed, and the wine 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. The best I have found 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 boiling water poured round it; it then remains until the heat of the wine ceases to increase. The wine is then returned into the cask, and the whole well agitated. The cask is kept perfectly full, and in a warm, dry room. 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 stick, and well incorporated with the wine. These casks must, as well as those of wines already mentioned, 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 what comes from the wine in the shape of yeast. Currant wine ought to be reduced in gravity at least three-fourths, (to 30,) before being bunged. If it can possibly be reduced four-fifths, it will be all the better. If the operator insists upon adding spirits to this wine, they should be put in when the gravity is 70. The casks are filled and bunged down, when visible signs of fermentation have disappeared. I beg to remind my reader, that the mode of racking, fining, and filling up the deficiency in the great cask from the fine 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.

The mode of managing this wine is the same as red currant. 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 of 30; and the liquor increased in gravity to 120, by the addition of sugar, either moist or lump. I refer my reader to the general rules laid down in article, Red Currant Wine, for fermenting, casking, racking, fining, and 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.

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 put 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 put on the husks, to make up the loss occasioned by boiling, and 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; and lump sugar added to bring up the gravity to 120 or 125. Crude tartar is broken in, in the same way as already stated, in the proportion of 1 lb. to 20 gallons. A ferment is generally wanted in all liquors that are boiled: to carry on a perfect fermentation, therefore, half a pint of good, fresh brewers' yeast is broken in with the crude tartar, and added to the compound when its temperature is 80. All excitement is used to assist fermentation, to attenuate the *must* to as near 50 as possible, 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 my reader to boil the fruit for this wine, the same as for the wine to imitate Constantia. Take as many currants as you may conceive to be necessary, remembering 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 put 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 lbs. 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 shall 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 put upon the raisin husks to extract their 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 twenty gallons, and the deficiency of gravity made up with loaf sugar to the standard 120. One pound crude tartar 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 crude tartar; both of which contain a considerable portion of this necessary ingredient. The farther treatment of this wine is precisely similar to that of the black currant; 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 foreign.

## CURRANT WINE BY ROZIER.

The following is the recipe 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, with wooden pestles.

"If the juice appears to be viscous, or too thick, add a few pints of water, but moderately, and only to give it fluidity; because without fluidity there would be no tumultuary fermentation, which is absolutely necessary, for the purpose of separating the constituent principles of the fluids which we wish to put in 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° or 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 fermentation 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 no 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 that *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-sieve. The remaining pulp press to dryness. Put both liquids 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 of my readers who may not have in their gardens a sufficient quantity of any one kind of fruit to spare, to make such a quantity of wine as would repay them for their trouble; yet who could make enough, 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 the more complete the fermentation. 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 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 same as Red currant, (see Red Currant Wine); not forgetting to use half a pound crude tartar to every ten gallons, dissolved as formerly directed. If properly attended to, the fermentation of this wine will also be complete.

### DAMSON AND RAISIN WINE.

To make a 15 and a 2 gallon cask of this wine, 9 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 9 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 again squeezed, the liquor strained, and measured, and the deficiency in quantity made up, by putting as much water in this fruit as is found necessary: the quantity should not be under twenty gallons. The gravity is taken after this, and the deficiency made up to the standard 120 with sugar. One pound of crude tartar is to be put into this *must* in a similar way, as before 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, being 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 the wine is wished 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 of our 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 should be employed. 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. The general rules for conducting the after process, 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 limpid and sparkling.

## STRAWBERRY WINE.

The same weight of water as juice is used for 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 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 lbs. of beet-root should be washed, scraped, sliced, and put into the fermenting tub, and allowed there to remain 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 in the fermenting tub, in order to impart to the wine a flavour of the fruit. As the process of fermentation in a great measure dissipates this 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 is taken from the muslin and 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 Red Currant wine. See Red Currant Wine. I have some of this wine twelve 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 by absorption. After this liquor has been again separated from the berries, and added to the first pressing, two quarts to be taken out for examination by the saccharometer. The gravity must then be taken 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 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 added; to every 10 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 not having in itself any natural leaven,) it will rank as a home-made wine of the first class. In order to accomplish this, the basis of orange wine must be extract of raisins. The following is the formula to make a 15 gallon cask and a 2 gallon cask. 40 lbs. of raisins are stalked, and 12 gallons of water put on them; the stalks washed with 2 gallons of water additional, and this strained into the tub containing the raisins and water: the steeping process is the same as that of Raisin wine. See Raisin Wine. When fermentation has extracted all their substance valuable for wine-making, the raisins are pressed, the liquor strained into a vessel sufficiently large 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, *i. e.* 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. After measuring, should the quantity of liquor or *must* be found too small, 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-fourth of a pint of good brewers' yeast is added, and the whole thoroughly mixed, the fermenting vessel well covered up, and placed in a warm room: this warmth being necessary, because this wine is made early in spring, the weather then being cold, and uncongenial 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 same as 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 steeped. When the water is put on the raisins they are broken with a bruiser, as in the former case, 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 3 gallons of water, and for this there must allowance be 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 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 standard 120; and half a lb. white argol, *i. e.* White wine tartar, mixed in, same as in the former wine. 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 longwise 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 mixed well up with the water. It is then covered up, and the next morning the whole mass is well 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; but in this wine there is generally a spontaneous fermentation. The after mode of management same as 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 the least 250 lbs. of apples and pears; an equal portion of each. (The fruit used when in its 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, bringing it up by a slow fire to the heat of 120 or 140 degrees, but not exceeding this, and keep it at this temperature in the copper for thirty 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 most likely will be 56 or 60; the deficiency to the standard gravity, 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 1 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 about 18. Allowing the gravity of the apple juice to be 60, this would bring it up to 78, still deficient 42; consequently 2½ lbs. raisins will still be required, making in all 3½ 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.

*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.

### 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. It is a mere compound of water, spirits, fruits, and spices; for no liquor ought to be called wine that is not duly 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 my 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 manufacturing what is really Ginger wine, when he finds so very small a portion of whisky used, instead of one-third or one-half, which is the proportion the generality of wine-makers use.

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 spirits he generally used to the gallon? he answered, 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 spirits. 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 sugar and malt.

I commence this process exactly in the same way as brewing ale; and for making a 15 gallon cask with a 2 gallon cask, as in other wines, there will be required 2 bushels of the very best pale malt, about 20 lbs. of sugar; and if the wine is desired warm of the ginger, 2 lbs. of the best Jamaica ginger must be used, thoroughly bruised; if, on the contrary, the wine is not desired to be very aromatic, $1\frac{1}{2}$ lbs. will be sufficient. To run off 18 gallons of malt extract, or wort, there will be required 24 gallons of water, as each bushel of malt will absorb rather more than three gallons of water. When I speak of gallons in any of the wines, &c. 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 now 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 26 to 30 gallons. The water must be boiling, and put into the mash-tub to the extent of 20 gallons: 4 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, and immediately thoroughly agitated, until every lump is broken, and the whole mashed into an equal consistency; which operation of mashing takes 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 to be boiled, and then reduced by the addition of cold water to 180; or if the weather is cold, to 185. This water is to replace the malt extract or wort, which is drawn off from the malt at the expiry of two hours. This malt extract or wort 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 prevented 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. Ten 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 heated with this water. This is allowed to remain covered up for ten minutes.

The cock or tap is turned in a similar way as before, and nine or ten 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 22 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 notice hereafter, and proceed in the meantime 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, loses in bulk from 14 to 15 *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. In order to make up the deficiency in bulk occasioned by boiling, a deficiency which will be farther increased by evaporation, the refuse of strained ginger, &c. is mixed with two or three gallons of cold water, as may appear sufficient, and put into a large pot to be boiled for one hour, which is again strained and added to that in the fermenting vessel.

One pound of argol or crude tartar is put into two quarts of the wort, at 190° of heat, and dissolved. This acid, however, is almost insoluble; at least, after the greatest pains have been taken, a considerable portion will still remain undissolved. When it is reduced in heat to 80, nearly an English pint of good brewers' yeast is added. It may be useful to some to be informed, 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 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 90, as occasion may require. The mixture of *must*, crude tartar, and yeast, is now broken into the whole mass, and well agitated at the temperature of 80°. 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 now taken and noted, and if it is reduced to 80 or 85, 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 turned a little off the perpendicular, and dishes placed under them, as before noticed in the Gooseberry wine; a portion being kept to fill up from time to time the casks. 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 or 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 exactly similar to the former wines I have noticed, fined, and bunged down tight. It may be bottled in four or five weeks. I have found it beneficial, at the time of racking, to return the fine wine into three five gallon casks, instead of into the fifteen gallon cask; and afterwards bottling off one as occasion may require. I have some wine made in this manner nearly seven 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 its 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 our agent. 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 from good table 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 70 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 after, 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.

## GINGER WINE.

This second way of making Ginger wine is to bring up the gravity to 113 by syrup, composed of sugar and water, instead of malt extract and sugar. The following is the formula to make a 15 gallon cask and a 2 gallon cask. By referring to the specific gravities, we find that 1 lb. of sugar dissolved in a gallon of water will give a gravity of 35; consequently 3¼ lbs. of sugar in a gallon will give a gravity of 113¾. As besides the two casks of 15 and 2 gallons, some will be required for filling up, it is advisable to make 18 gallons, provided the operator has got a copper that will boil 24 gallons. For making this quantity, 18 gallons, 58½ lbs. of sugar are required. Should the copper be only sufficiently large to hold rather more than half, say 13 or 14 gals., the sugar and ginger could be boiled, the liquor run off, and a sufficient quantity of water, to make up the deficiency, put on the refuse, to be boiled the second time.

58½ lbs. of sugar are put into the copper with 10 gallons of water: when the scum rises it is from time to time carefully taken off, both before and after boiling, and put in a bowl. When the scum ceases to rise, 1½ lb. of the best Jamaica ginger, thoroughly bruised, is then added to the syrup in the copper, and boiled for thirty minutes: the syrup is then run off, and strained into the fermenting tub. It may be observed here, that the process of boiling will evaporate nearly from 14 to 15 *per cent.*; but as this in a great measure depends upon the manner of boiling either slow or quick, it is always advisable here, as well as in all *musts* that are boiled, to measure the strained liquor, in order to be guided how much water to put on the second time, making allowance for the farther evaporation in cooling down to 60 degrees of heat, which will be from 9 to 10 *per cent.* The requisite quantity of water is then put into the copper, taking again into consideration the loss it will sustain in this second boiling by evaporation, the refuse of ginger being well mixed up with it. This boils for one hour. For example, let us suppose that there were put on 10 gals., which, when strained after boiling, measured 8½, and lost by evaporation, in cooling down from boiling heat to 60°, 1 gallon more. This leaves only 7½, but we need 18. There will now be required, instead of 10½ gallons to be put on the refuse, to make up the 18, 14 gallons, as this latter will likewise lose by evaporation, and in proportion to the former.

The second liquor is then drawn off and strained into the former. When cooled to 90°, the whole is measured; and if the quantity is found to be less than 18 gallons, it is made up by putting the requisite quantity of water upon the refuse. Two quarts are now to be taken out for examination by the saccharometer. Should there be any deficiency in gravity, it is made up by mixing up a small quantity of sugar in the mass, until it has arrived to standard 113. 1½ lb. white argol must be mixed up and thoroughly dissolved in the two quarts; half an English pint of good stiff brewers' yeast is also mixed up, and when the *must* is degree of heat 75 or 80, these two quarts, with the white argol and yeast, should be well broken into it. The fermenting tub is placed in a warm room, and covered up; the following morning the whole is thoroughly mixed, and the head, which has been formed by fermentation, is well broken in, and incorporated with the mass. This operation is repeated night and morning, until the gravity has been reduced 25 *per cent.* Portions of the *must* are taken out once a-day and weighed by the saccharometer, and noted, to serve as guides for future occasions. When the *must* has attenuated to that degree, the head is skimmed off, one gallon taken out and heated to 100, by putting the vessel containing it into a pail of boiling water; one-fourth English pint good brewers' yeast is broken into it, and then it is mixed thoroughly up with the mass. The casks intended to contain it are washed out with boiling water, and the liquor put into them while they are warm. The casks are raised on a stand sufficiently high to admit of a tub standing under each of them at the time of racking. A dish is placed and kept continually under them, 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 liquor, and find, on one side of each cask, an easy descent. Great attention is required that the casks may be filled up every two hours for the first two or three days, and after, as occasion requires. Before each time of filling up after these two or three days, the lees are roused up with a stick, in order that they may be thoroughly incorporated with the wine: for notwithstanding that fermentation will throw the yeast up to the top, a certain portion of it will fall to the bottom and mix with the lees. By this operation of stirring, languid fermentation is again invigorated. Should this rousing fail of the desired effect, it is necessary to draw two or three quarts from the cask into a vessel, which is placed into a pail of boiling water, as on the former occasion.

When this portion is brought up to 90°, or, at the highest, 100°, one quarter of an English pint of the thick that was skimmed from the liquor before casking is mixed with it, and is allowed to remain until fermentation has caused it to expand. This portion is then returned into the cask, and well mixed with the whole wine. 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; previous to which a spile-hole is made about an inch and a half from the bung-hole, 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 thoroughly washed with cold water, and slightly sulphured; for the method of which, see Sulphuring of Casks. Two bottles of whisky are put into the casks, and so rolled that every part of the interior 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. The lees are then put into the small cask, one English pint of finings put into the large cask, and well incorporated; the cask then well bunged down, the spile kept out for a few days, and then firmly fixed. When this wine is kept in the wood for two years it 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 three five-gallon casks; the two first to remain in the casks until required, and the last that was run off bottled in about a week;—the three casks having been fined at the time of racking, and the deficiency made up by the fine of the 2 gallon cask, this last being again filled up with the lees of the 15 gallon. This will give a very wholesome, cheap beverage, as will be observed by the following statement:

| | | | |
|---|---|---|---|
| 58½ sugar, at 6d. *per* lb. - - | L.1 | 9 | 3 |
| 1½ ginger, 2s. 6d. do. - - | 0 | 3 | 9 |
| 1½ argol, 6d. do. - - | 0 | 0 | 9 |
| ⅓ gallon whisky, 6s. per gal., - | 0 | 2 | 0 |
| Coals, - - - - - | 0 | 0 | 6 |
| | L.1 | 16 | 3 |
| 16 gallons *fine wine*, containing 8 dozen, 4s. 6d. - - | 1 | 16 | 0 |
| | L.0 | 0 | 3 |

*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 fore.

## 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 of 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 5 lbs. of the best Malaga raisins to every gallon of water, providing the ale wort which is to be used is in gravity 90. If above 95, 4 lbs. to each gallon will suffice. The raisins should be put into a tub without the head, and the necessary quantity of water put on them: the loss by absorption will be made up by the water that washes the stalks. 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 time.

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, *i. e.* yeast, it ferments spontaneously. This fermentation acts with violence upon the remaining sweet of the fruit, until it deprives it of the whole, to which time the gravity of the liquor will increase. The instrument shews this with the greatest nicety; for at every examination it will be found that the gravity has increased, until it comes to that point already spoken of, when fermentation has deprived the fruit of all that is beneficial.

At this period the fruit is pressed and the liquor then strained; about two gallons of water put upon the fruit, which 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 1 lb. of sugar to each gallon of wort, and boiled for thirty minutes, carefully skimming it before and after it comes to the boil, 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 half a pound crude tartar, in order to dissolve it as before noticed. When cooled down to 90, the whole is added to the raisin extract, with a quarter of a pint of good fresh stiff brewers' yeast.

*Example.*—To make 17 gallons of this wine, take 75 lbs. of Malaga raisins,—the fruit to be treated in the same manner as that in Raisin wine. When the raisins are separated from their stalks, pour upon them 12 gallons of soft water, heated to 90, and at the highest not exceeding 100; stir the whole well 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 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.; boil this compound for half an hour, carefully skimming it, both before it boils and after, 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 9½ gallons, when at 60° of heat.

Squeeze the raisins that were steeping into another vessel, 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; put 2 or 3 gallons of water upon the raisins which have been squeezed, to make up 20 gallons. Conduct the after process of this wine exactly as Raisin wine; if for a dry wine, same as Dry Raisin wine; if for a sweet wine, as 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 |

roots are added if the colour is wished to be high, or 7 lbs. if not so high. The beet-roots are scraped, washed, and sliced as 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; but the colour will not be rosy, which, 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 is employed to eight gallons of water. 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 in keeping. I have saccharometer, 2 lbs. argol or crude tartar having previously been dissolved in two quarts of the wort when about 190 degrees, half a pint of good brewers' yeast is added and thoroughly mixed with the wort and tartar, and, when cooled down to 70 or 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 exactly the same as the ginger. 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 after the introduction of agriculture by the ancient Britons, were ale and beer substituted; as we see in 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 with 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 shews 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 *Mil-fion*, that is, honey-wine. It is mentioned also in the Life of St Berach, who flourished in the seventh centhe 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 1 lb. of argol for every twenty gallons, and one-fourth of 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 the 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 skimmed off, the *must* having been previously weighed to ascertain its required attenuation; and the yeast skimmed off is kept to excite fermentation at any time it may become languid, by taking out a portion of wine from the cask and warming it to 90, breaking the yeast into it, and then mixing it again in the cask, stirring up the lees. At the time of racking, the cask is sulphured, and wetted thoroughly in the interior with two bottles of whisky. The final gravity of this wine will not be under 50. The after management of it same as 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 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 for 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 roots and water to meet this loss by evaporation: indeed this remark is 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 1½ lb. crude tartar added, if the quantity made is to the extent of from seventeen to twenty gallons. The crude tartar is broken, thoroughly dissolved in hot *must* as before noticed, and mixed with the whole liquor. As this compound has in itself little of that necessary ingredient, natural leaven, an artificial ferment is required; half an English pint of good brewers' yeast is well mixed up with the *must*, when the heat is 75° or 80°, but in warm, close weather, it need not exceed 70°. It is then covered up and kept in a warm room.

The following morning the head is broken in, a portion 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

## FRONTINIAC.

To each gallon of water 3 lbs. of sun raisins are used. They are stalked, bruised with the hand, and the necessary quantity of water put upon them; and this allowed to remain until their substance is extracted, which the saccharometer will shew. They are then squeezed, and the liquor strained into a vessel for fermentation. To every six gallons of raisin extract a half 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 of 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; a quarter of a pound of white argol is used. One dozen of lemons for every ten gallons of *must* are strained into it just before casking. This wine needs a ferment, but not to so great an extent—four table-spoonful of good brewers' yeast are sufficient. The flowers remain in the fermenting tub until the *must* is casked, when it is strained.

The after process same as 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 14 to 18. If, on examination, they should be found to be under that gravity, they must be fined and racked off in a week: after which 1 gallon of wine with sugar-candy is mixed to the extent of $\frac{1}{4}$ 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 some wine, to the extent of a 50th part, it will recover it, so that it may be racked in five days. Those of my readers 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 my reader a short account of how it is produced, whence it is taken, and its analysis; assured that this will prevent his entertaining any prejudice against it.

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; familiarly known by the name of Argol. This crust is scraped from the interior 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; *2dly*, 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 present 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 whisky 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 successful, I shall now lay before my reader, adding one or two methods from other writers.

Isinglass and milk are the ingredients generally used for 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 the fire, it will dissolve in a much shorter time. After ascertaining the quantity of wine 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 dimension. I add two quarts more 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. Jullian 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 should 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. 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 ripe soon, it is advisable to lay them on their sides 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, INFUSION AND DIGESTION.

# LIQUEURS.

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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 going into 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.

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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 prevents the contents burning, and is unquestionably the best for an amateur.

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 spirits, 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 spirits, it must be put into the still again. The reason 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 it over again.

By this mode you may procure every kind of aromatic water,—by adding one pound of the 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.

for boiling. It is then close 'be procured, and
means of pasting all the cre' all, wild, black cher-
vapour may escape : the ' ks. The fruit is to be
derate fire. The wor de of mortar, and allowed
amined, and kept fu' eight weeks. The fruit is
drawn off when it distilled : the whole may be
cold; another c ute quantity of spirits of wine,
the contents the extent of an English pint to
stream, lik nds of cherries. This will really be
the comr spirit when it is mellowed with age.
Were
it to
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### SPIRIT OF PERCICOT.

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.

E fifteen Seville oranges, nine China ges, and eight lemons; grate their rinds; add 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; jellyflower, 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 matrass 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.

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THE eight following receipts are extracted from the Memoirs of the Caledonian Horticultural Society, which were transmitted to that society by L. P. Esq., and were highly approved of. In a letter to the Secretary of that society, he concludes: "In the spirituous mixtures 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 them, and mix 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 brandy 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 Creme de Rose.*

"Put four pounds moss-rose buds into ten pints of good whisky; let them stand for six weeks, shaking them twice every week; then squeeze the rose leaves from the spirits: put the leaves

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

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 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 rose, 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 Creme de Rose."

*Mode of making Creme 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 Creme de Rose; and, when cold, mix in the same proportion, and you will have Creme de Moka."

*Mode of making Kirschwasser.*

"Take any quantity of full ripe geans and cherries, and, in a mortar or wooden tub, bruise kernel and pulps. 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, Creme 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 that a quarter of an ounce each; of the seeds of anise, caraway, and coriander, rather better than half an ounce each; liquorice root, $3\frac{1}{4}$ oz.; 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 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 existence 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 it 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 accessaries 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 fruits should be very ripe, without being too much so: the flowers flagrant, always gathered in a fine season, and shortly after sunrise: in short, take care that nothing tastes mouldy, for wherever this disagreeable 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, that it may not be too thick, and by this means either prevent the liquor passing through altogether, or, by causing it to pass through too slowly, and allow the spirit to evaporate. Next, that it may not be too thin, and by allowing it to run through 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, (English 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 required 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 be easily 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 with these, 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 Morello 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.

MORELLO 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, are 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.

## 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 it 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; spirit 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 facilitate 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 bud. 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 Muscadel 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 spunge, 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 pennyweight 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); with it put a pint of cold water. When the sugar is dissolved set it on a moderate fire; beat about half 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-stopped bottle. It will keep for months.

## DIRECTIONS FOR MAKING DR KITCHINER'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 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 liquors 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.—KITCHENER.

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 spirituous 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 peppermint; 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 how to make up the above.*

Powder half an ounce of sugar in a brass mortar, on which pour the oil of peppermint, 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 ANISEED 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 stopped; 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: cardamom 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 two gallons 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 Jamaica ginger, and bruise it with a hammer, piece by piece, so that it may be all 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 whisky 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 of 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 good malt whisky, 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 the four quarts of malt whisky.

### 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; and 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 is 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 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 then 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, a 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 Morello 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;

and 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, &c. 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.

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Brewing and Wine-making are so nearly allied, that, literally speaking, making ale is nothing more nor less than making wine from malt by the process of fermentation, instead of making wine from the grape, by a similar process.

The methods used in producing these liquors are different, although not so much so in the former stage of the management as in the latter; for, as the brewer's principal study is to exhaust all the fermentable matter his malt contains, so the wine-maker's object is to extract all the goodness of the fruit he employs. It is not possible for those who know not the value of the materials they have to work upon to attain either of these ends. Even to those who do, it is impracticable, without the aid of the saccharometer, to ascertain whether they have succeeded or not. As I have therefore entered very fully into the merits of the saccharometer in the preceding pages, 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 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 extracting the substance. Without the use of this instrument we should not be able to regulate the heat of the water for this purpose; but now we can proceed without fear or danger. Were we to use the water at too high a temperature we should lose upwards of one-fourth of all the malt that has been wetted; as it would go into 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 gluey paste, the centres of each being composed of unwetted malt, which would remain locked up in this paste, and useless. If, on the other hand, we use water at too low a temperature, the farina will not be dissolved; and, besides the loss we shall experience in the deficiency of gravity in the extract, the liquor will not be transparent. These evils, however, are not so great as the former one, as they can, in a great measure, be remedied by using, for the second mashing, or sparges,* water of a higher temperature. Besides the necessity of the thermometer in this first stage of the process, its value is equally great in the latter, 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 heat. 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 we should draw, by judging according to the touch, would be erroneous at both these times; and the consequences might prove fatal to our hopes of a consistent fermentation. In short, to say the least, if we prove successful in obtaining our desired wish, we should be more favoured by chance than good management.

Since the introduction of these instruments brewing has become a science. It is now no longer a piece of mechanical operation, to be per-

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

formed by any illiterate person. Yet, I am sorry to observe, that there still remain some so averse to change, 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 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 send a captain 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 cannot be valuable to the one, and altogether valueless to the other.

It must be owned that there are many families who are noted for good ale, made without using either of these instruments, and who pride themselves in excelling their neighbours in producing it; but they are regardless of the expense and trouble it costs them; and if it is not drinkable, in consequence of improper management, in six or eight months, they can allow it to stand for a year, and try if, in another brewing, chance will favour them more than in this. Ask even those 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 study here to endeavour to give my reader such information, as will enable him to brew uniformly, and without the chance of 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 almost 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.

Regarding the value in gravity of a bushel of good malt, by referring to the table of specific gravities, it will be found that it is equal to about twenty-four pounds of sugar; 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 from 55 to 100, and some even higher, 105,—although now this is very rarely the case.

The English brewers, with the exception of one or two, as at Burton, &c., make their ales from worts of a gravity considerably lower, for they rarely exceed 85, the lowest 55: 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, if the second wort be obtained by sparges instead of 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 five gallons, the gravity of which may be about 86, 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 seventy gallons in the whole. 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 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 54, and the quantity sixty-four gallons. Thirty-seven gallons are then sparged at different times, in portions not less than five gallons each sparge. From these sparges thirty-seven gallons are run off, making in the whole 101 gallons, say 58 gravity. 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, with eight gallons 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 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 85 or 90, but if he be only desirous to obtain 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 will obtain it. 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; by pouring on it eight gallons of water at a judicious 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 will 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. However, let us suppose one-half remains, namely twelve pounds; instead of having eight gallons of wort, of gravity 108, he will only have five gallons at gravity about 86. The remaining 12 lbs. of sugar, the half of 24 lbs., is still with 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 saccharum which remained 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, which may be accomplished, if judiciously managed, by sparging over the mash eight gallons of water, at four sparges, at two gallons each sparge, 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 4 lbs. of saccharum to be extracted, leaving still 2 lbs. with the grains †. The gravity of this table-beer wort will be 18.

I may just here notice the prejudice which exists, that a good ale cannot be brewed from a

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* 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. | |

† One bushel of malt equal in value to - 24 lbs. sugar.

| | | | |
|---|---|---|---|
| Extracted 9 gals. ale wort, | containing 2 lbs. *per* gal. | = | 18 lbs. |
| 8 do. table beer, | do. $\frac{1}{2}$ lb. do. | = | 4 |
| Still with the grain, | - | | 2 |
| | | | 24 |

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 being kept steadily up; and if less than six bushels are used, this disadvantage will arise. 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 skilfully 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 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, and possessed of the knowledge which, I trust, what I have written has been the means of conveying to his mind; the Amateur operator has an unerring guide to direct him in purchasing his malt, and brewing from any gravity he may feel disposed to choose. All this, however, will be of little value, unless he applies these principles. The mere reading of them will be altogether insufficient to enable him to produce, from even the best malt, ale of such a quality as will afford him satisfaction.

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

## WATERS.

Waters differ very much in their quality and in their value for brewing, (*i. e.* for extracting the substance from the malt.) To find out the nature of the water about to be used for the purpose 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 should 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 that water for brewing 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 the domestic brewer gains by the use of 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, temperature 182°, on a bushel of malt; mash it well; allow it to stand for an hour and a half. Put eight gallons of hard water in another vessel, temperature 182°, in a bushel of the same malt, treating it in the same manner. Draw the two extracts off into 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. These are obtained 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 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 will differ still more; as in the very best, twenty-six pounds of fermentable matter or saccharum have been extracted from one bushel, whereas in another there will not be twenty pounds got. 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, it is not so, we should then waste the malt, which would have produced a great deal more; whereas, had we ascertained the value of the malt before we drew off the extract, this waste would have been prevented.

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 be paler. Much also depends on the grinding. Some persons suppose that the goodness cannot be thoroughly extracted, if it is not almost ground to powder. This idea is quite absurd, for malt should only be thoroughly crushed. When it is so 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 the least forty-eight hours before it is used; if sixty hours it will not be injured, as it loses all the heat which it got in the operation of grinding, and is 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 to a state of perfection.

Malt contains certain portions of salts and oils; the former strongly excite fermentation, the latter restrain it. The brewer's aim then is to heat the water 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. If it is to be kept, the heat must be high at mashing, to extract as much oil from the grain as will prevent too great an excess of fermentation; if it is, on the other hand, 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, *i. e.* extraction.

## MASHING.

The copper having been filled with water, which is allowed to boil, the operator having ascertained the quality of his malt, and having determined upon the quantity he means to brew, as well as the strength; he allows a necessary 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 put into 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 is 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 this last degree, as even five degrees higher would prove injurious to fermentation, and prevent the ale 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 the 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 tun for two hours, or rather one hour and a half, having sacks upon it to keep in the steam, as the mash must be kept as hot as possible. It is here that private brewers generally err, allowing their mash to stand too long: the consequence of which is, that the wort runs off when too cold, and is not so transparent as it ought to be. 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 underback, 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 thus 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 mashing has been too great; if it comes down muddy, dead, and without froth, it shews 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 enters the underback.

During the hour and half the mash is resting, the copper is filled with water to be boiled ready for the second extraction. When it is found that nearly the whole of the wort has been run into the underback, which may be known by applying the gauge stick, as well as by observing the smallness of the stream; the second boiling of water, of an equal quantity as the first, and at a higher temperature, (190° to 192°,) is spread at four or five different times, upon the surface of the mash. The tap of the mash tun is turned, the cover put on as before, and allowed to stand for ten minutes. To simplify this process; at the time the first extract is running into the underback, when the bed of the grains in the mash tun appears dry, and the contents in the underback having been found, the operator may judge that a sufficient quantity of wort has been run off, and that this is now the time to put the second water upon the mash, which, in order that it may not be disturbed, should be done as lightly as possible, by means of a wooden hand-bowl, or a gallon and half piggin. When these ten minutes are expired, the tap is partially turned as before, and the second extract run on to the first in the underback. Notwithstanding all this care to prevent the sediment escaping, and to ensure the extract running clear, for a few minutes at the first it will be cloudy. To remedy this evil, which will exist both in the first and second running, a pail is placed under the tap to receive the extract until it appears perfectly clear; when the pail is removed, and its contents returned again into the mash tun, in as light a manner as possible. In both cases the tap may be gradually turned, so as to increase the volume of liquor; but this must be managed with caution, lest a too sudden enlargement render the wort thick.

The other sparges are added in like manner as the first, at intervals of fifteen minutes, so as to allow the water to percolate through the mash, and extract as much of the saccharum as possible.

As much has been said regarding the advantage of sparging, instead of again mashing, it may not be out of place here to explain the nature of it, as well as the method of performing this operation. It is hot water sprinkled over the mash at different times, short intervals occurring between each time. The method used, is running the hot water from the copper, at heat from 190° to 195°, into a trough, perforated with small holes at the bottom and sides, so that the water may not fall heavily, or dash on one part of the mash, but spread itself equally over the whole surface: this trough is suspended over the mash-tun, and can be moved by the hand round every part of it. Some brewers move it by machinery.

To such as brew on a large scale, a trough is necessary; but as this treatise is written not for the use of the common brewer, but as a guide to private families who brew at home, and of course on a small scale; I should recommend a watering-pot instead, which will answer their purpose equally well. It should hold about two gallons and a half, and either be made altogether of wood; or if of tin, the two handles should be of wood, to prevent the heat from the hot contents burning the hands.

From the rose of this watering pot, the liquor may be spread equally in a shower over the surface of the mash.

I have noticed the operation of sparging, as having been performed when nearly the whole liquor had been run off from the first mash; but probably it is better to commence sparging at an earlier period, perhaps when two-thirds of the extract have been run off; by this means the mash will be kept warmer, which is of great advantage. It may be necessary to notice, that the tap after the first sparge is kept open, so that the wort continues to run out, without ceasing, until the required quantity has been extracted.

The operator having decided upon the quantity of ale he intends making, his next object, in order that he may not be disappointed here, is to gauge again, after the sparges, the wort in the underback, bearing in mind that the process of boiling, the absorption of the hops, and the evaporation in cooling, will necessitate him to draw off 35 *per cent.* more, to meet the deficiency in quantity: the gravity, however, will be increased, nearly to the same extent that the quantity is decreased. When the required quantity, as found by the gauge, has been run into the underback, the tap of the mash tun is turned; in the meantime the copper has been again filled and the water in it boiled, and when cooled to temperature 195°, 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 loss of

20 *per cent.* 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.

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: generally speaking an hour is enough. Previous to drawing off the whole from the copper, it is advisable to take out a portion to ascertain by the saccharometer its gravity.

The wort must be kept boiling rapidly all the time; for fast boiling will cause the wort to break and fine itself much sooner, than it would if 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 settling to the bottom, which they are much inclined 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 be 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.

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 upwards of eight hours, nor should it be allowed to cool in less time 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, &c. The generality of private brewers, not considering this, separate their worts for the purpose of cooling, into as many utensils 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 likewise the sediment in each being disturbed by the pouring out of the worts, some portion of it will again incorporate with them; whereas, in the regular cooler, the worts running off 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 they are 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 *foxed*, and will always be in a heavy state, as the yeast will not separate itself.

To proceed. The worts being now at the proper temperature, (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 any 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 acid. For this quantity,—a hogshead,—and at the gravity, &c. already mentioned, three English pints of good brewers' yeast are abundant. Two-thirds are dissolved in a portion of the wort at temperature 85°; and when fermentation has commenced in this, another and equal portion is added to it; in a very short time a vigorous fermentation will ensue. 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, and afterwards the evil cannot be remedied. By keeping out one-third, the operator 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 of 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 has formed an erroneous idea that his worts should have the next morning, after being put into the fermenting tun, a fine cauliflower head, whereas they should only have a slight cream; the cauliflower head not on 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 attenuation.

The next morning the white cream is mixed up with the whole of the mass, a portion taken from the tun, and examined by the saccharometer. The thermometer should likewise be used, when it will shew 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, not proceeding as desired, a small portion of yeast is added, and well incorporated with the mass. The following morning, if fermentation is vigorous, the cauliflower head shews itself, and has in general patches of dark-brown yeast on the surface of it; these must be carefully removed, for were they allowed to remain, they would incorporate, and impart to the ale a disagreeable, bitter flavour. The white part of the head is again mixed with the mass, and a sample taken and examined by the saccharometer, when a farther 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 its attenuation.

When the white, foamy head gives place to a dark brown one, with 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 requires more attention than this critical moment. After skimming, a portion is taken out for examination, and should it appear that attenuation has not arrived to the desired point, which should be to the one-half, or at least to two-fifths of its original gravity, it is roused up well and skimmed every two hours until this is attained.

As the process of casking is very apt to check the necessary fermentation; 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 bunghole; by so doing there will be a greater probability of the ale coming to perfection, and at an earlier period. 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 the ale, and flatten it.

The ale casks are allowed to remain on the stand until fermentation has subsided, when they may be removed from the brewhouse 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, at 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 brewhouse 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 put in: 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 tightly 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.

Should the ale or beer, notwithstanding all the attention of the operator, be cloudy and thick, to endeavour to fine it by artificial means will be absolutely necessary. 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 a half English pint of this gluten put in 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, as it always tends to flatten it, and rather promotes 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 45 to 50. 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 it will do 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 temperature 75°; the following morning it is casked, and filled up as frequently as the ale was. The fermentation, in general, will subside in forty-eight hours, when the beer is bunged down, and removed to 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.

*Example.*—How to manage a brewing with 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 sometime before, as recommended, 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 212° to temperature 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 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 refilled. The mash remains thus covered for one hour and a half. At the expiration 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 the mash-tun, and the clear wort allowed to run into the under-back, the volume gradually increased by turning the tap. The cover is removed from the head of the mash-tun when the wort begins to run slow; and after having drawn off nearly forty gallons, the tap is turned, and forty-two gallons of water, temperature 188° to 190°, are poured on the grains, in seven quantities of six gallons each, at intervals of fifteen minutes between each six gallons. The copper is again filled, and the mash-tun covered as before, and allowed to remain so for fifteen or twenty minutes after the last sparge. In the meantime, the quality and quantity of the wort in the underback is ascertained, for the purpose of knowing how much of the second extract is necessary to be drawn off. Suppose there are already forty gallons in the underback; to make up the sixty-three gallons, only twenty-three gallons would be required; but during the different stages of process which the wort has yet to undergo, great losses in quantity will be sustained, 1st, in boiling; 2d, absorption by hops; 3d, by evaporation in the coolers; 4th, in the fermentation. These losses will, at least, amount to from 30 to 33 *per cent.* Were only the sixty-three gallons to be put into the copper, at casking; there would be, instead of sixty-three, only about forty-eight. So instead of drawing off only twenty-three gallons from the second extraction, there must be that quantity to make up the sixty-three gallons, and upwards of 30 *per cent.* more on sixty-three gallons, say nineteen gallons; therefore the second extraction must be forty-two gallons instead of twenty-three, making in all eighty-two gallons with the first and second wort. When, by the gauge, there are found eighty-two gallons in the underback, the tap is turned, and thirty-six gallons of water for the table-beer, temperature 190°, strewed upon the mash. The fire being at this time damped, the wort from the underback is put into the copper as quickly as possible, and the fire replenished; eight pounds of the best East Kent hops having been weighed, four pounds of them are immediately put with the wort into the copper: this should be made to boil as fast and as briskly as possible; for the quicker the worts boil, the sooner they will break. Most domestic brewers have formed very erroneous ideas, that their ale will not keep unless it is boiled for a considerable time: some absolutely boil their worts for three hours, whereas from sixty to seventy minutes are quite sufficient for worts of any strength, if they boil rapidly. They generally also put the whole of their hops into the copper at once; this I have found to be a bad plan, for by boiling long, they lose a great part of their fine aromatic flavour, a flavour which ought 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, you extract the goodness of the former quantity, and the aromatic flavour of the latter, reserving the remaining good 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 re more valuable for the second wort.

Before, however, the wort is put into the copper, the quantity is ascertained to be eighty-two gallons; namely, forty gallons of the first extraction, and forty-two gallons from the seven sparges, of six gallons each. 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 192 lbs. of sugar, taking it for granted that he uses the very best 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 should be 86$\frac{2}{5}$, (this is supposing that one-half of the saccharum has been extracted.) This gravity is exactly equal to two pounds and two-fifths of a pound of sugar to each gallon.

These forty gallons of wort contain ninety-six pounds of the saccharum, and the second wort having been drawn off to the extent of forty-two gallons, will deprive the mash of one-half of the saccharum that was left in it, after the first extraction.

Now, there remains in the mash only forty-eight, (instead of ninety-six,) the half of the original 192. Having now drawn off forty gallons at $86\frac{2}{5}$, and forty-two gallons at $41\frac{1}{7}$ gravity, (say 86 and 41,) the whole amounting for the ale wort to eighty-two gallons, the mean gravity must now be found. This is done by multiplying the two worts by their respective gravities, then adding the products together, and dividing by the number of gallons.

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      40 galls.          42 galls.
      86                 41
      ---                --
     240                 42
    320                 168
    ----                ----
 40 3440                1722
 42 1722                ----
 -- ----
 82)5162(62 78/82
    492
    ----
     242
     164
     ---
      78
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By this example it will be seen, that the mean gravity is so nearly 63, that it may be called so, especially as I have not worked the fractions. Having now drawn off nearly six pounds of sugar or saccharum by the first extraction, and forty-eight pounds from the seven sparges, there remain now only in the mash forty-eight pounds for the thirty-six gallons of water, which are to be sparged in the same manner, with six sparges, with six gallons each. This last extraction will run more than thirty-six gallons, as there was some left in of the ale-wort. Having now forty-eight pounds for thirty-six gallons, the gravity should be 48, there being one pound and a third of sugar to each gallon. This is supposing the whole goodness has been extracted by the last sparges; but as this is not likely to be the case, the gravity of the wort for table-beer may be 36 instead of 48, leaving in the mash still twelve pounds. By the addition of a quarter of a pound of sugar to each gallon of this wort, the gravity may be brought from 36 to 48, which, when boiled for two hours, will be increased from 48 to 53 or 54, and a most excellent beer produced, nearly equal to the Edinburgh sixty shilling ale.

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 the former, light sugar is used, if the latter, dark. 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 will shew. "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."

*Obs.*—It is not unlikely, that the first seven sparges may draw off more of the saccharine matter for the strong ale-wort than has been mentioned above, and consequently the last six sparges for table-beer wort may not be so strong; but the saccharometer will indicate the exact 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, we proceed. This is boiled thirty-five or forty minutes, when the remaining four pounds of hops are then 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 now is in the underback, 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, in the same way as the ale-wort, into the other cooler.

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 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, both of the ale and of 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.

## 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 unacceptable to some. 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 malt, two bushels of brown, and fourteen pounds of patent black malt are employed. The malt having been crushed or ground forty-eight hours previous, sixty gallons of boiling water are run into the mash-tun, and when reduced with cold water to temperature 180° or 182°, 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, temperature 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: indeed, 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 farther process is the same as the ale. This porter will be equal in gravity to the very 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 half a pound of sugar or 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 of my readers may feel inclined to convert one or two of their outhouses into a brewery, I shall now give a plan of the interior of one, so constructed as to enable one person to conduct the process with the greatest ease, with but 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 the first used, I shall commence with it. I should recommend this, instead of being made of iron, to be made of copper, for the following reasons: 1st, a copper boiler will take less fuel to make it boil than an iron one; 2dly, it will, at any time within fifteen or twenty years, fetch nearly half of 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 $1\frac{3}{4}$ 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 to be driven in at the time of brewing. The advantage of using this kind of tap 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 canvas 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 canvas, which should be about twelve or fourteen inches in the spout. It is advisable 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 be either 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 or three inches in breadth, to support the false bottom, which should be about three inches above the real bottom; a tap must be placed where there is this false bottom, at the under part of the mash-tun, but so that the top of it does not rise above the surface of the real bottom. 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. 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 gauge-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 gauge-stick, marked No. 3. The 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 rather under the edge of the spout.

## FERMENTING TUNS.

THE fermenting tuns should be of sufficient capacity to hold seventy-five to eighty-five gallons each; they should have taps at the bottom; these taps should be made with screws. It would save a great deal of trouble to have leather pipes of sufficient length, when screwed on to the taps, to draw off the beer 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 bunghole at the top should be sufficiently large to admit of a person's hand and arm going in to clean the cask; these bungholes 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 shew the way in which they are to be placed, so as to avoid expense and unnecessary labour.

## THE BREWHOUSE.

The brewhouse 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 brewhouse; 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, having a stage round it, so 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 brewhouse, (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 brewhouse; and this will be a great means of preserving the wood work.

I should recommend the brewhouse 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.

## THE TUN ROOM AND CELLAR.

This apartment, separated by a wall, should be immediately behind the brewhouse, 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.

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