THE

MANUFACTURE

OF

CIDER AND PERRY,

REDUCED TO RULES.

BY J. HAM.

SHERBORNE:

PRINTED FOR LONGMAN AND CO., LONDON; AND PENNY AND SON, SHERBORNE;

BY HARKER AND PENNY.

1828.

PREFACE.

HAVING, throughout my life, been in the constant practice of tracing the progress of that all-important process, *fermentation*, in a great variety of vegetable liquids, by the aid of instruments fitted for the purpose, I have constantly found them as certain a guide in their application to the manufacture of Cider and Perry, as to all other vegetable extracts or decoctions; and as they have never yet, to my knowledge, been in use among the Manufacturers of Cider, I have, in the following treatise, en-

deavoured to give such directions as shall induce them to apply to unerring guides, for pilotage through the intricacies of a process of nature, the hidden operations of which these instruments immediately detect and expose to view. For this purpose I have ventured on the present title to my treatise, and to assert that, on a careful perusal of it, such rules will be elicited, as cannot fail to circumscribe and point out the causes of future failure, in such manner as to identify them, free from the possibility of mistake, and thus to direct the operator's attention to the exact points really required for the improvement of a beverage little inferior to the juice of the grape, instead of

allowing it to wander in the dark, in the manner it has done for ages, in search of improvements, without a hope of hitting on them but by the merest chance. As well might a navigator attempt to trace his path without a compass, as a manufacturer, engaged in the preparation of vinous liquors, endeavour to conduct it properly without the aid of the *thermometer* and *saccharometer*. I shall, therefore, in the subsequent pages, make use of the clear and definite language which these instruments enable me to speak, and endeavour to explain their use in such manner as may be readily understood.

THE MANUFACTURE OF CIDER AND PERRY.

The juice of the apple is composed of water, sugar, mucilage, a ferment somewhat of the nature of yeast, a small portion of colouring matter, and an acid, known under the name of malic acid.

Apples contain a much larger quantity of this acid than pears, and it is to be met with in all fruits containing kernels or stones, and in almost all the sweet fruits, and its quantity is constantly lessening in proportion as the fruits ripen.

It is this acid which injures the quality of all spirits distilled from liquors containing it.

Cider and Perry, when genuine, and in high perfection, are excellent vinous liquors, and are certainly far more wholesome than many others which are at present in higher estimation. When the *must*, or juice, is prepared from good fruit, well ground, and undergoes the exact degree of vinous fermentation requisite to its perfection, the acid and the sweet are so admirably blended with the aqueous and spirituous principles, and the whole so imbued with the grateful flavor of the rinds, and the agreeable aromatic bitter of the kernels, that it assumes a new character, grows lively, sparkling, and exhilarating; and when completely mellowed by time, the liquor becomes at once highly delicious to the palate, and congenial to the constitution, superior in every respect to most other English wines; and such would it be pronounced by all competent judges,

were it not for the popular prejudice annexed to it as a cheap, home-brewed liquor, and consequently within the reach of the vulgar. This liquor can be made to surpass some of the foreign wines occasionally imported, as much as it excels them in cheapness; but it is not often that we can meet with Cider or Perry of this superior quality, although it only requires an intimate knowledge of the theory of the process of manufacture to accomplish it, without any change in the fruit at present in use, for nature has done every thing, and art almost nothing.

It is very mortifying, that, after the experience of so many centuries, the art of preparing these ancient British Liquors should still be in its infancy; that throughout the principal fruit districts, the practice should still rest on the most vague and indeterminate prin-

ciples; and that the excellence of the liquor should depend, rather on a lucky random hit, than on good management: yet such appears to be really the case, even among the more experienced cider-makers of Herefordshire and Gloucestershire.

Mr. Marshall, who expressly undertook a tour through these counties, for the purpose of enquiry on this subject, informs us, that scarcely two of the professional artists are agreed as to the management of some of the most essential parts of the process; that palpable errors are committed as to the time and manner of gathering the fruit, in laying it up, in neglecting to separate the unsound, and to grind properly the rinds and kernels; that the method of conducting the vinous fermentation, the *most essential part of the operation*, and which stamps the future value of the

liquor, is by no means ascertained. While some promote the fermentation in a spacious open vat, others repress it by inclosing the liquor in a hogshead, or strive to prevent it altogether; that no determinate point of temperature is regarded; and that the use of the thermometer is unknown, or neglected; that they are as little consistent in the time of racking off, and whether this ought to be done only once, or five or six times repeated; that for fining down the liquor, many have recourse to that odious article bullocks' blood, when the intention might be much better answered by whites of eggs, or isinglass; and, finally, that the capricious taste of particular customers is generally consulted, rather than the real excellence of the liquor, and, consequently, that a very imperfect liquor is often vended, which tends to reduce the price, to disgrace

the vender, and to bring the use of Cider and Perry into disrepute.

The art of making vinous liquors is a curious chemical process, and its success chiefly depends on a dexterous management of the vinous fermentation; and this cannot be accomplished without proper instruments, any more than a watch can be made without tools. Can we longer wonder, then, that so many errors should be committed by illiterate cider-makers, totally unversed in the first principles of the chemical art? Some few, indeed, more enlightened than their brethren, and less bigotted to their own opinions, by dint of observation, strike out improvements, and produce a new thin liquor, of superior quality; though, perhaps, far short of excellence, yet still sufficient to show what might possibly be accomplished by a series of new experiments, conducted on rational

principles. This might lead to successive improvements, till at length our English fruit liquors might be carried to a pitch of perfection hitherto unknown, by which the demand, both at home and abroad, would soon be enlarged, the prices augmented according to the quality, the value of estates increased, and the health and prosperity of these countries be proportionably advanced. This might also help to point out a method of correcting the imperfections of these liquors, and of meliorating those of a weak meagre quality, by safer and more effectual means than are now practised; and though nothing can fully compensate the defect of sunshine in maturing the saccharine juices in unfavourable seasons, yet probably such liquor might, without the dangerous method of boiling in a copper vessel, admit of considerable improvement by the

addition of a portion of rich *must*, or of honey, sugar, or even molasses, added in due proportion previous to fermentation. In fact the Germans are known to meliorate their thin harsh wines, by an addition of concentrated *must*, not by evaporation but by freezing:* this might possibly be done in England, if cider making should not be finished before a hard frost sets in, but that is too uncertain to be relied on.

It has been already stated that the most important part of the process consists in duly ordering the fermentation, for it is frequently to this alone that the various qualities in the same sort of beverage is to be attributed, and its progress cannot be traced without the con-

* The juice, before any fermentation has commenced, is exposed to frost, which separates the watery part in the shape of ice, and leaves the remainder much richer.

stant use of the instruments already mentioned.

Fermentation may be called a natural process in as far as it takes effect spontaneously, when favourable circumstances are present. But although commenced by *nature*, it depends on *art* to regulate this, as well as all the other operations required for our subsistence and health: it is a continuation of chemical decomposition on dead vegetable matter, which would proceed, if left to itself, until it resolved the mass into the different elements of which it is composed. As I mean this work for popular information, I shall endeavour to divest it of technical terms and figures as far as possible; but I must still, however, apprize my readers, that it will be quite impossible at all times to render my meaning sufficiently concise, without some terms borrowed from chemistry.

Although chemists have divided fermentation into *three*, and some into *five* different species, without any sufficient reason for so doing, I shall confine myself at present to the *vinous*, or that concerned in the production of all kinds of liquors used as a beverage, particularly as applicable to Cider and Perry, in which the manufacturer is greatly in want of some rules to guide him; but this appellation can scarcely be deserved by those who merely press the juice from the fruit, and put it into casks, leaving nature to perform nearly the whole process, and yet will venture to assume some credit to themselves, if they, by the merest chance, happen to have a pleasant liquor.

I must also say a few words to those who are prejudiced against what they call "manufactured Cider," as if it were high treason to improve upon na-

ture; for the admixture of innocent articles to enrich the juice when too harsh, and of burnt sugar* for colouring when too pale, is not more dissimilar than that of the various qualities of the apples themselves; and as well might they object to all the different species of British wines, because they are not solely the produce of the fruit of which they bear the name.

Many persons feel a sort of pride in possessing a *recipe*, which they flatter

* This is made by putting sugar into an iron or copper boiler, with a few spoonsful of water, and then boiling it until a suffocating odour arises, and it becomes quite black and bitter, and the sweetness has entirely disappeared; at this period, boiling water must be slowly added to it, until it is sufficiently diluted, when it is to be reserved for use. One pint or quart of this colouring (according to the quantity of water added) will in general be sufficient for a hogshead of the palest cider.

themselves is an infallible preventive or cure of all diseases incident to the liquor of which I am now speaking; and although frequent failures in its application might have taught them its utter inutility, yet they have still to learn that, in all operations depending on the very delicate process of fermentation, no fixed or general rules can be laid down but those drawn from first principles, and dependant on the judgment of the operator for application when required: the grand art, in these cases, is to know how to take advantage of circumstances, for the most minute will frequently have a very powerful influence; such as change of temperature in the air, the local situation of cellars, the state and even *size* of the utensils, the more or less contact of the liquor with the atmosphere, and its aptitude to become fine or remain turbid, &c. The operator's skill is

therefore to be exerted to control those which are unavoidable; and this cannot be acquired but by a proper and judicious theory; for, in its absence, no one can depart in the least from the beaten track, without hazard of being lost in difficulties—he is at sea without a compass.

I have been thus particular that no one may be led to expect any directions in the style or manner of a cookery book, because they will for ever be totally inapplicable to the subject in question.

The assortment of fruit has doubtless some influence on the future product, where it can be made, provided the different qualities are correctly ascertained; but as no rules have ever yet been laid down for it, so as to be perfectly understood, and even if any existed, it would be very difficult to communicate them from one district to ano-

ther, on account of the almost infinite variety of the soil of orchards, of the apple, and of the local names by which the different varieties are known, this part of the manufacture cannot be subjected to any useful directions, further than that a proportion of sweet and acid fruit be used; but such proportion will admit of a considerable range, as the taste may in a great measure be regulated by the fermentation.

In order to prove that the quality of the fruit, as far as the palate is concerned, is not so various as may be supposed within the range of English orcharding, let any person visit the mouths of the different cider-presses in the proper season, and ascertain whether or not he can, by his taste, discover any appreciable dissimilarity between the various sorts of apple-juice which is running therefrom: I believe his remark

will be that "it is surprising such a uniformity of taste, from the first process, should undergo so great a change by the time the liquor is fit for use;"—and this must be occasioned totally by the fermentation.

It is however certain, that in particular districts, there is a manifest want of a proper mixture of fruit; for in the islands of Guernsey and Jersey the sweet fruit abounds, and it is partly on that account that the Cider made therein wants the vinosity and smartness on the palate which distinguishes the English Cider, and it does not keep so well. If the inhabitants of these islands were to plant a few of the Crab-Apple-Trees in their Orchards, their Cider would be considerably improved thereby.

The *specific gravity* of any fluid is its weight compared with that of an equal bulk of water. Now the strength or in-

toxicating quality (and in a great measure their pleasantness, when strength is a subordinate consideration,) depends on their original specific gravity, before the fermentation commences. This gravity, or weight, is gradually diminishing by the fermentative process; so that, when it is completely finished, some of them little exceed that of water, and foreign wines, completely fermented, weigh even less, by which a considerable quantity of spirit is formed at the expence of the sweet quality, until at last the latter totally disappears. Here then is a guide by which to measure the progress of the fermentation, or the sweet-destroying process; and in the public breweries an instrument has long been used for that purpose, called a *Saccharometer*, which is equally applicable to Cider. The scale of this instrument is formed on the difference of weight between a bar-

rel of water (thirty-six gallons) and a barrel of wort, and when applied to the juice of the apple immediately from the press, it generally indicates it to weigh from eighteen to twenty-one pounds per barrel, according to the maturity of the fruit, more than an equal bulk of water.

This juice, if left to itself, at the age of one or two years, becomes reduced to about two pounds only heavier than water—a strong, but by no means a pleasant beverage; and, indeed, in all the liquors we drink, it is not so much *strength* which is required as gratification of the palate; for the difficulty does not consist in making them strong, nature herself will generally do that without any interference on our parts.

That no one may therefore be deceived, I think it proper to say, that whoever is desirous to produce intoxication by Cider should take no steps to check

its fermentation; but those who are aware of the delightful beverage it is capable of making, and that a British Champagne, nearly approaching to the foreign, can be produced from it, will be fully alive to the utility of art in controling the operations of nature.

The fermentation of cider, then, should only proceed so far as to cause it to become brisk when bottled, or to produce a constant, but very slow, supply of carbonic acid gas; for it is this gas, or air, to which all liquors owe their briskness, and a very small loss of weight will be sufficient to produce the necessary effect; for if it were possible that there should be no loss (and therefore no fermentation) it would never effervesce in bottles.

Now, with the small instrument alluded to above, floating in half a pint of the Cider, the progress of the fermenta-

tion is ascertained in a moment, and with the greatest accuracy; and it will besides be of use to indicate the relative quantity of saccharum (or the fermentable quality) in apples of different years' growth.* Every person, I should therefore hope, will readily understand the great importance of making use of unerring guides in this important manufacture; and learn, that if *chance*, at any time, make good Cider, *art* will make it better.

In all fruits, and probably also in the edible roots, the *pure juice* is separated from the *ferment* (or that principle which causes it to go through the fermenta-

* I have found such difference to amount to at least twenty per cent, and it surely is, therefore, no unimportant information to receive, that a stock of Cider made in any particular year, exceeds in quality and strength that of another year' manufacture by so considerable a proportion.

tive process, like yeast or barm), by cellular membranes, which being broken by compression, or any external force, a mixture of the saccharum (or sweet quality) and the ferment takes place, on which a mutual action commences; for the pure saccharine matter is absolutely incapable of fermentation alone, were it possible to be separated in the state in which it exists in the apple, &c. Hence the cause of the fruit being incapable of preservation for any length of time, or of its speedily rotting, after receiving a blow by falling from the tree, or otherwise; and as nature has, in all the fruits, attached a proportionate quantity of the ferment in juxta-position to the saccharum (or fermentable principle) which they contain, this is the reason that they spontaneously form a vinous liquor, and, to point out the modes of obtaining a command over this

operation, is the object of the present work.

The Herefordshire mode of grinding, or rather pressing, the apple, has been much praised by a celebrated writer, and his reasons for it appear to deserve some consideration. The method there adopted must first be explained :—The apple is ground in the manner adopted by tanners; that is, by making an immense stone move round in a circle vertically, underneath which the apples are placed, which in its progress presses, rather than grinds, them to a pulp. During this process, in consequence of the pulp lying all around the circumference of this circle, at a small depth exposing a great surface, the air of the atmosphere appears to act on it very considerably, so as to change its colour in a great degree; and, at the same time, it is observed, that the juice or pulp increases

in the richness of its flavor, and becomes more sweetened. But in the present mode of grinding and pressing the apple in Devonshire and Somerset, perhaps few improvements can be introduced, (as sufficient exposure to the atmosphere can at all times be obtained, as will appear in the sequel,) except that of passing the pulp between two rollers, set sufficiently close to crack the kernels, which will then afford a grateful flavor. But before I advance beyond the cider-press, I must stop to remark on a disease, formerly, perhaps, more common than at present in the west of England, called the Devonshire cholic. This was no doubt occasioned by lining the bed of the press with sheet-lead, which any of the vegetable acids will attack and dissolve, in different proportions, when in contact with the air; and as any solution of lead, introduced into

the stomach, becomes a slow poison, it is not surprising that the native acid of the apple should be the means of conveying it into the Cider, made in any sort of utensil where it can come in contact with lead. I therefore hope that all Cider-makers will be scrupulously careful to exclude this metal from every part of the apparatus they use.*

It has already been mentioned that exposure of the pulp to the air appears to have a powerful effect in adding to its colour and sweetness; therefore, it is

* Instances have been known of unprincipled persons using *sugar of lead* to enrich cider and wine; and although, in some instances, ignorance of its deleterious effects may be adduced as an excuse, I here wish to take that away from every person into whose hands this work may fall, by pronouncing *sugar of lead*, in every shape, to be a virulent poison, and every person using it for this purpose as the *concealed murderer* of his fellow creatures.

very probable that, before it is committed to the press, if it were placed in a large tub, and agitated by a stirrer for a considerable time, a great improvement in the quality of the Cider may be the consequence; and if the temperature of the air during the season of making should not exceed forty-five degrees of the thermometer, the pulp may remain in this state many days, or even weeks, without fermenting, by which time the grateful bitter of the kernels would be completely extracted and incorporated with the liquor.

We will now suppose the juice of the apple or pear pressed out and lying ready for future operations. In the space of a few days this juice will commence the vinous fermentation, (and if the weather be warm, in a few hours,) which will proceed with more or less rapidity, from a variety of causes, until

the liquor has lost all its sweetness, and it then, but not till then, becomes a completely intoxicating beverage. But in order to make it a *pleasant* one, fit for the tables of those who wish to employ it merely as such, it is essential that the fermentation should not proceed so far as to destroy all its sweetness; a portion of it must be retained for this purpose, and the fermentative process arrested by art at the proper point. It is true that in a very few instances this may not be necessary, arising, perhaps, from some peculiar quality of the apple, or of the soil on which it grows; but as the juice, immediately as it runs from the press, is in all cases nearly alike to the taste, and as no instruments, nor any chemical tests, have hitherto been invented, sufficiently accurate to detect the principle which constitutes the difference in its fermentative quality,

we have only one alternative—to check the fermentation by art; and any method of arriving at a complete control of the process is all that is necessary to produce a beverage pleasant to every variety of taste.

As before observed, fermentation being the only spirit-forming process, (for the simple juice directly from the press has no intoxicating quality whatever,) the more it is checked, the less strength the liquor possesses.

But it must be repeated that the *strength* in Cider or Perry is not the quality which adds to its price: this advances according to its pleasantness on the palate, without any reference whatever to the quantity of spirit it contains, which is quite a secondary consideration, or rather no consideration at all,

The first object, therefore, is to separate the feculencies, or the floating

foul parts of the juice therefrom, as soon as possible after it comes from the press. This may be accomplished, (in the small way) by filtering, or by adding some substance which will prevent the commencement of the fermentation, until these feculencies shall have subsided; for after the operation has begun, they are kept constantly floating and adding to its force. The former mode is not easily effected in quantities, because the feculencies, abounding at first in a rich juice, are continually choaking every sort of filter hitherto invented, but there is one which may be rendered useful for the purpose at an advanced stage of the operations, as will then be described. Notwithstanding that I am anxious to avoid every thing which may have the appearance of a puff, I must still say that I know of no better plan at present of

arresting *the very commencement of the fermentation* (and it is of much consequence to do it at this early period) than by the *anti-ferment*. Let a supply of this be added before any internal motion takes place in the juice—the gross feculencies will in the course of a few days have subsided, and the subsequent operations become much simplified.

The common process of making Cider and Perry in Worcestershire is as follows:—After the liquor has remained sometime in the fermenting vessel it is racked or drawn off from the lees, and put into fresh casks. The ordinary time for racking is before it has done hissing, or sometimes when it begins to emit fixed air in plenty. The only intention of the operation is to free the liquor from its fæces, by a cock placed at a little distance from the bottom, after which the remainder is to be filtered through

a canvas or flannel bag; this filtered liquor differs from the rest in having a higher colour, and having no longer any tendency to ferment, but, on the contrary, checking the fermentation of that which is racked off, and if it loses its brightness, it is no longer easily recovered. A fresh fermentation usually commences after racking, and if it become violent, a fresh racking is necessary in order to check it, in consequence of which the same liquor will perhaps be racked off five or six times; but if only a small degree of fermentation takes place, which is called *fretting*, it is allowed to remain in the same cask, though even here the degree of fermentation, which requires racking, is by no means determined among the makers; the best manufacturers, however, repeat the rackings, until the liquor will lie quiet, or nearly so; but as it is generally

found impracticable to accomplish this by the ordinary method of fermentation, recourse must be had to fumigation with sulphur, which is called *stumming* the cask. For this fumigation it is necessary to have matches made of thick linen cloth, about ten inches long, and an inch broad, thickly coated with brimstone for about eight inches of their length. The cask is then properly seasoned, a small quantity of Cider put into it, and every vent, except the bung-hole, tightly stopped; a match kindled is lowered down into the cask, and held by the undipped end until it be well lighted, and the bung driven in, thus suspending the lighted match within the cask. Having burnt so long as the contained air will supply the fire, the match dies, the bung is raised, the remnant of the match drawn out, and the cask suffered to remain for two or three

days before it is filled. The liquor retains a smell of the sulphureous acid, but this goes off in a short time, and no bad effect is ever observed to follow: for this troublesome and operose method the anti-ferment is a complete, instant, and most effectual substitute.

The fermentation, however, though effectually checked, will, after a certain lapse of time, proceed with different degrees of force (but in all cases much slower than it would otherwise have done), according to the fermentative quality of the produce of different orchards, which appears to vary with the soil; and although, in some instances, this supply of anti-ferment may be sufficient without any more care being bestowed on the Cider, still that is not to be depended upon, and a convenient mode of racking should be adopted, to remove the char Cider from its lees as

fast as the latter form. I shall therefore now proceed to give instructions for racking.

In France the following plan is adopted for the purpose with that delicate wine Claret. The casks are arranged side by side, and the one last in the row is empty. A connection is then made between this and a full one adjoining it, by tapping them both with wood pipes, or faucets, connected together with a leather pipe. Thus a communication is formed between both casks, and the wine in one of them immediately flows into the other, until it arrives at the same level in both, when of course its further progress ceases. They then put the wooden spout, or nozzle, of a bellows, made for the purpose conically to fit tightly into the bung-hole of any cask, and by working the same, the whole of the wine is forced into the other cask,

in a quiet stream, without much agitation, which this wine in racking should not undergo; and of course, as the tap-holes are rather above the bottom of each cask, the lees are left behind, and are then taken out and put into straining bags. When the cask which contained the wine is thus emptied and cleared out, the next is then transferred to it in the same manner, and so in succession throughout the whole line. Now the only difference to be made in applying this plan to Cider or Perry, is that these liquors should be racked *with some degree of agitation* (after they leave the cask), instead of being done quietly like claret. This may be sufficiently effected by carrying the leather pipe, attached to the cask to be racked into the bung-hole of the other; and then, by working the bellows, the whole of the Cider will be forced into it, and by fall-

ing from the top to the bottom thereof, the agitation will be sufficient to expel the fixed air (carbonic acid gas) which it contains, (without impoverishing the Cider, as by the common method of racking exposed to the air,) and thereby causing it to deposit more quickly the feculencies which the fixed air has always a tendency to keep floating.

But now, after the gross lee has separated, and the Cider or Perry become comparatively fine, is the time to make use of filtering bags with great advantage, and the floating lee, which promotes and protracts the fermentation, will then be left in them. The arrangement of apparatus in Fig. 1st.* both for the purposes of racking and filtering at the same time, is therefore proposed for trial, as superior to any other, although rather more complex,

* See Plate.

and I have great reason to suppose that it will be perfectly effectual; but as the filtering part itself is the subject of a patent, it cannot be used without leave of the patentee, from whom the bags can at any time be obtained, by addressing as directed in the explanation of the plate.

I am now arrived at the most important part of this treatise, that of making use of some definite language with respect to which the fermentation may be allowed to proceed, and at what period it ought to be arrested, and I can only speak that which all will understand when they employ a Saccharometer,* and I must entreat those gentlemen who may have some influence among

* I have prepared an instrument of the kind for the use of Cider-makers, which will be offered at a cheap rate, and may be had of the venders of the anti-ferment, with full directions for its use.

their neighbours, to encourage the introduction of "rule and compass" into so important a manufacture, as much as possible; for all directions without its assistance must be most vague, and generally useless.

Cider or Perry is in the state in which it is generally preferred by private families, and in which it obtains the best price, when the number of degrees of the apple-juice, as indicated by the instrument immediately as it runs from the press, is reduced by the progress of the fermentation *one quarter only*, or at most *one third;* that is, if the original specific gravity should be 54 by the saccharometer, the fermentation should not reduce it lower than to the 36th or 40th degree, beyond which it should be prevented going by the means already pointed out, which will generally be found effectual if well attended to, when

the Cider-maker's compass, the saccharometer, shall indicate the weight or gravity to be sinking too fast. Daily trials should therefore be regularly made with it whilst the least hissing noise is heard in the Cider or Perry, and the loss of weight regularly noted, which, if it proceeds too rapidly, is then sufficient notice that one of the modes of racking already explained must be resorted to. By these means a complete control of the process will be obtained; but to those who are determined to pay no attention to it, these directions are not addressed.

As for the method so often advised, of completely closing the cask for the purpose of attempting to check the fermentation, so that no vent whatever be allowed in it, I consider it of no further use than to cause leakages in old casks, with the risk of forcing out their

heads, to which all persons are exposed who adopt the plan.

It is almost useless to repeat the "twice told tale" of guarding all fermented liquors as much as possible from changes of temperature, because vaults or cellars underground are not always obtainable; it is therefore sufficient to advise that a choice be made where heat or cold are least likely to penetrate.

Whatever may be the accumulation of lees or bottoms, they should remain until the next season in a close cask, secured from the air; they may then be put into a common sack bag, and placed on the top of the apple-pulp in the press, when all the Cider will be separated and mix with the new, without any injury to it, provided the bottoms are free from acidity.

The Cider which is pressed out from the lees contains a much greater quan-

tity of spirit than that from whence the lees were deposited.

The practice of fining Cider or Perry by isinglass is exposed to very grave objections. There is a *racy* principle in the juice which gives the liquor that *smack* on the palate which is so much admired: this principle is what is called the astringent one (similar to that in port wine), and is composed of the substance denominated "tannin" in chemistry. Now isinglass will immediately unite with it, and they both together form an insoluble compound, and sink to the bottom, to the great loss of a powerful preservative principle in the liquor, and also a great impoverishment in the taste.

If a greater degree of brightness be required than will be obtained by the preceding operations, the mode adopted for fining Wines in France will in all

probability be found equally effectual for Cider and Perry. A cask of any kind is filled full of beech shavings, such as may be procured from the saddletree-makers; the Cider or Perry must then be added to fill all the interstices, and in the course of a fortnight or three weeks it will become perfectly transparent, and may be drawn off, to give place to a fresh supply; but care must be taken that the shavings be *never uncovered* by the liquor but for the smallest possible space of time whilst drawing off, and they should be well scalded with boiling water before they are first used, afterwards they scarcely ever decay, or want changing, for any number of years, although they should once a year be taken out and well washed.

CIDER-WINE.

MANY trials have been made by Cider-growers to improve the quality of their article by boiling the juice immediately as it comes from the press, and some have even attempted the same thing after the fermentation. Now, in the former case, boiling evaporates nothing but watery particles, and in the latter it dissipates its spirit or strength.

Merely heating the apple-juice up to the boiling temperature has no doubt a great tendency to check the fermentation; and if the boiling be continued until one quarter or one half the bulk is evaporated, the remainder becomes proportionally stronger, and more nearly resembling the consistency of the

juice of the grape in the wine countries; and if a liquor resembling wine is intended to be made, this is one mode of doing it, provided the evaporation could be accomplished without imparting an unpleasant taste; but this has never yet been done; for copper vessels will invariably give it, and iron is inadmissible, as that metal has a tendency to turn the colour black.

The method of making Cider-Wine, which I am now about to propose, will obviate these difficulties.

We will suppose the maker has some old Cider in his possession, which has thoroughly undergone the vinous fermentation, so that no sweetness remains in it: this, if sound, would, by distillation, produce about seven gallons and one quarter, old wine measure, of proof spirit, (the strength of foreign brandy,) per hogshead of sixty-three gallons.

At the period of Cider-making, let half a hogshead, or thirty-two gallons, of this Cider be put into a boiler, as represented in Fig. 8, sufficiently large to allow room for its boiling gently. This boiler may even be of iron, for in this case the liquor therein will be thrown away after the operation. When fitted up as represented, into a full-sized hogshead put fifty-four gallons of apple-juice, immediately from the press, that is, leave a space in the cask sufficient to receive nine extra gallons of liquor; put this cask near the boiler, so that the pipe (A) shall descend to the bottom thereof; now light a fire under the boiler and make the liquor boil moderately, but not too fast; the steam (which consists of the spirituous, or only valuable part of the old cider) will enter the cask containing the new, and be condensed thereby with a loud crackling

noise. Continue the boiling until the cask is full, by which time all the spirit originally contained in the half hogshead of old Cider will be transferred to the new, thereby heading the latter, if the process has been conducted sufficiently slow so that it has not boiled over, to the temperature of 190 or 200 degrees of the thermometer. This elevation of temperature will act as a powerful check to the future fermentation; it will have been produced in the most innocent manner, and at the same time will have concentrated nearly a hogshead and half of Cider into the space of one hogshead, which is equivalent to strengthening the juice by boiling in the same proportion, and therefore bringing it nearer to the strength of the *must*, or juice, from which wine is made.

Nothing more is now necessary than to put this hogshead of new wine into

the cellar, pasting brown paper over the bung-hole, and allowing it to remain in this state (occasionally observing that the paper is not removed from its situation) until the month of March following, when it should be racked, and the bung-hole may be closed with cork; but still it will require occasional inspection, to observe whether the fermentation is forcing the cask, as in that case it must have vent.

In due time, and if a proper age be allowed, I think it will be found (although I do not wish to speak positively on a subject which can easily be put to the test of experiment, at a small expense,) that this cask of the juice of the apple will produce better wine than much of that which is imported at a considerable expense, and under heavy duties; and the remuneration to the manufacturer will be more than suffi-

cient to pay him for this trouble and expense, and for the sacrifice of half a hogshead of Cider on one hogshead.

These directions are equally applicable to Perry.

In the conclusion of this article I must once more repeat, that it is not strength or spirituosity which is required in Cider or Perry to add to its value, but that pleasant mixture of sweetness and vinosity which fits it for a thirst-extinguishing beverage; and which will also, by the judicious application of the method of improvement herein pointed out, admit of its becoming the means even of improving the thinner sorts of foreign wines by a proper admixture. For this purpose all the care bestowed on its manufacture will meet a most ample reward, and such as ought to be sufficient to stimulate all growers to acquaint themselves with the

whole theory of the process of the manufacture; for there never will be any invention which can possibly be a substitute for human reason, and the use of this attribute is especially required in the profitable management of all fermented liquors.

APPENDIX.

It may not be unacceptable to my readers if I transfer to these pages an account of a valuable Cider Apple, called the *Siberian bitter-sweet*, which the President of the Horticultural Society forwarded to the Secretary of the Hereford Agricultural Society. The following is the description of the properties of this fruit, sent with the grafts:—"The tree produced its first blossom ten years ago, and has produced ten successive crops of fruit. The trees raised by grafting from it have borne with equal regularity, no frosts having occurred sufficiently intense to materially injure the blossom, though those upon contiguous trees have been more than once wholly de-

stroyed, and several times much injured. The trees grow very rapidly, and are wholly free from disease. The fruit becomes sweet long before it is full grown, and is free from perceptible acid. Its pulp acquires an extremely deep colour when bruised, and the juice is deeply coloured and intensely sweet. Its specific gravity in the last season when it was pressed from the mature and yellow fruit, was 1.098.* If the watery part of the juice be evaporated by a moderate heat, a considerable quantity of exceedingly sweet jelly remains, which is very agreeable, and which might, for a great variety of purposes,

* This I fear is a mistake, for the specific gravity of the juice of the apple generally, as well in this kingdom as in France and the Islands of Jersey and Guernsey, seldom exceeds 1.055, as I have had an opportunity of ascertaining.

T. H.

supply the place of crystallized sugar, and might be obtained at a much lower price. It might be unquestionably applied with much advantage to give richness to the Cider obtained from other apples in the spring. The apple-tree bug has never been upon the original tree, nor upon the graft taken from it; though I have frequently inserted grafts into stocks where these insects previously abounded, and have continued to abound. The fruit is small, not exceeding the weight of a middle sized golden pippin, and the apple is only valuable for Cider.

Perry is confined almost exclusively to Herefordshire and the adjoining counties, and is never manufactured in Devon or Somerset. I am rather surprised that the landowners of these latter counties do not think it worthy their attention to propagate the pear-

tree, for it is more hardy than the apple, and, Mr. Knight says, may certainly be cultivated in almost every part of England. Like the apple, it grows in strong deep soils with the greatest luxuriance, and in these the finest liquors are obtained. Its culture differs so little from that of the apple, that the same rules are in general equally applicable to both. It is most successfully propagated on stocks of its own species, but it will succeed, in some degree, on those of the quince, the medlar, the whitebeam, the common service, and the hawthorn.

The pear possesses many advantages over the apple for general culture, as it is much more productive of fruit, and will flourish in very different soils; and as it is incapable, in the sorts which are used for Perry, of being eaten or applied to any other purpose, it is little subject to be stolen in situations where

fruits are scarce. As an ornamental tree it is very superior to many others, for its form is frequently very picturesque, and its blossoms in the spring, and fruit in the autumn, are extremely beautiful. Every tree, when nearly full grown, in moderately good ground, will afford an average annual produce of more than twenty gallons of liquor, and an acre is capable of containing thirty at least of such trees, which continue productive for a great length of time. Apple-trees certainly begin to bear much earlier, but the produce of an acre of them will generally be found one-third less than the same quantity of ground planted with pear-trees. To amateur planters, I therefore recommend attention to this subject.

Fig. 2.

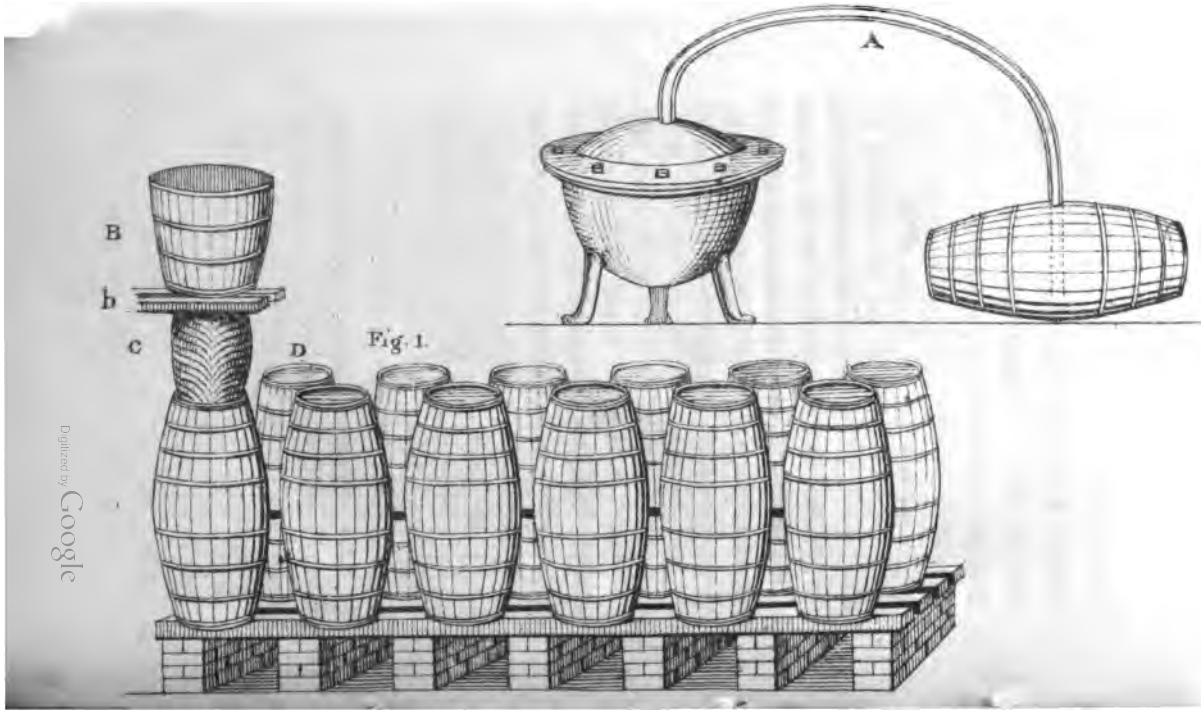

Fig. 1.

EXPLANATION OF THE ANNEXED SKETCH.

FIG. 1 represents the manner of placing the casks for racking, which are all connected together by a pipe, as shewn in the black mark between each. D has its head out, for the purpose of placing a small pump therein, or for otherwise conveying the Cider therefrom into the tub B, which is supported by *b* sufficiently high above the cask below as to allow the filters C to be fixed underneath the tub, in a manner which cannot easily be explained until they are seen. When the Cider has deposited its gross lee (which the anti-ferment will hasten), let as many of these casks (connected together as represented) be filled as the maker may think proper. The liquid will then communicate throughout the whole of them; and as fast as it is dipped, or pumped, from D into B, a stream will make the circuit of the whole, replacing what is taken from D, and leaving its feculencies in the filtering bags, which can be taken away and replaced as soon as they get choaked.

N.B. This operation is only necessary when the Cider is in a state of fermentation; if it remains still, leave it so, and cover over the casks C and D closely with bags, and attend to it occasionally, to observe if it commences a hissing noise, and as often as that happens, repeat the operation.

Fig. 2 is intended to shew the manner of making Cider-Wine, as recommended at page 49, where A is the pipe passing from the boiler to the cask containing the juice recently pressed from the apples, and the boiler may be even in the open air, and heated by wood.

Any further explanation may be obtained by addressing the Author, to the care of the Printers, Messrs. HARKER and PENNY, Sherborne, *post-free*, without which no letters can be received.

FINIS.

HARKER AND PENNY, SHERBORNE.