A

TREATISE

ON THE

Art of Making Wine

FROM

NATIVE FRUITS;

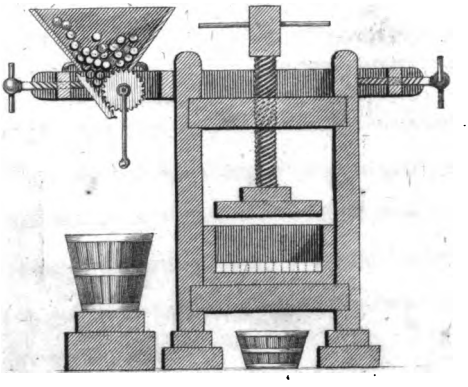
EXHIBITING THE

CHEMICAL PRINCIPLES UPON WHICH THE ART OF WINE MAKING DEPENDS; THE FRUITS BEST ADAPTED FOR

Home-made Wines,

AND

THE METHOD OF PREPARING THEM.



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PREFACE.

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My principal intention in this Treatise has been to give a concise description of the art of preparing the several varieties of Wine which may be made from the fruits of domestic growth, to enable those who possess no knowledge of the subject to proceed with facility and success.

I have prefixed a slight historical sketch of the Art of Making Wine, and have elucidated its general principles, without regard to which, all attempts

at preparing Domestic Wines must depend on chance, and be ever subject to failure or uncertainty.

I have stated the distinctive characters of British Fruit Wines, and their chemical differences from the Wine of the grape. I have pointed out the native fruits most capable of being converted into Home Made Wines, and have given directions for preparing the several kinds most generally esteemed. Lastly, I have stated, on the authority of an eminent philosopher, some prevalent errors with regard to the manufacture of British Wines, and the injurious effects resulting from them.

FREDRICK ACCUM.

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Art of Making Wine.

HISTORICAL SKETCH OF THE ART OF MAKING WINE.

It is impossible to trace the era when mankind first discovered the art of making wine. This discovery seems to be lost in the darkness of antiquity, and the origin of wine has its fables like all other things which have become objects of general utility. Almost every country in which the wine is indigenous, has boasted of some individual or native deity to whom the honour of the discovery has been described.

We are told by Athenæus, that Orestes, the son of Deucalion, came to reign at Ethna, where he planted the vine.—Historians agree in considering Noah as the first who made wine in Illyria, Saturn in Crete, Bacchus in India, and Osiris in Egypt. A poet, who assigns every thing to a divine source, is inclined to believe, that after the deluge, God granted wine to man to console him in his misery. Even the etymology of the word wine has given rise to different opinions among authors; but from that long series of fables with which the poets, who are always bad historians, have obscured the origin of wine, we may collect some valuable truths, and among these we may venture to class the following.

The Asiatics first learned the art of cultivating the vine from the Egyptians; the

Grecians from the Asiatics, and the Romans from the Greeks.

The earliest authors not only attest that they were acquainted with the art of making wine, but that they had some very correct ideas in regard to the different qualities and the various ways of preparing it. The heathen deities, we are told, delighted in nectar and ambrosia.

The earliest historians who have furnished us with any positive facts respecting the making of wines, leave us no reason to doubt that the Greeks had made considerable progress in the art of preparing and preserving them. They distinguished wines into two kinds, according as they were produced from the juice which flowed from the grapes spontaneously before they were trod upon, or from the juice expressed by treading them.

Homer distinguished wine by the name of a divine beverage. In his time various sorts of wines were well known, and by the praises which he bestowed on them, he seems, as Horace observes, to have often experienced their exhilarating effects; his heroes were animated by it in their councils and in the field. Nestor was not more remarkable for his length of years than for his large draughts of wine.

Plato, who strictly restrains the use of wine, and severely censures an excess, says, that nothing more valuable or excellent than wine was ever granted by God to mankind. Plato, Æschylus, and Solomon, ascribe to it the property of strengthening the understanding. But no writer has better described the real properties of wine than the celebrated Galen, who assigns to each sort its peculiar uses, and

describes the difference they acquire by age, culture, and climate.

It was customary among the Greeks to prevent intoxication by rubbing their temples and forehead with precious ointments and tonics. The anecdote of that famous legislator, who, to restrain the intemperance of the people, authorized it by an express law, is well known ; and we read that Lycurgus caused drunken people to be publicly exhibited, in order to excite a horror of intoxication in Lacedæmonian youth. By a law of Carthage, the use of wine was prohibited in the time of war. Plato interdicted it to young persons below the age of twenty-two. Aristotle did the same to children and nurses. And we are informed by Palmarius, that the laws of Rome allowed to priests, or those employed in the sacrifices, but three small glasses of wine at their repasts.

When we read with attention what Aristotle and Galen have handed down to us on the preparation of the most celebrated wines of their time, we can hardly help believing that the ancients employed artificial heat to thicken or to dry certain kinds of wine in order to preserve them for a long time.

Aristotle tells us expressly, that the wines of Arcadia became so dry in the leather bags in which they were kept, that it was necessary to scrape them off and dilute them with water before they could be fit for drinking.

Pliny speaks of wines kept for a hundred years which had become as thick as honey, and which could not be used till diluted with warm water and strained through a cloth.

Galen speaks of some wines of Asia,

which, when put into large bottles suspended near the fire, acquired by evaporation the solidity of salt.

It was certainly wine of this nature that the ancients preserved in the upper part of their houses, and in a southern exposure; these places were distinguished by the appellation of *apotheca vinaria.*

But all these facts can relate only to mild, thick, and little fermented wines, or rather to juices not altered and merely concentrated. They were extracts rather than liquors.

Each kind of wine had a known and determinate period, before which it could not be employed for drinking. Dioscorides fixes this period at the seventh year, as a mean term. According to Galen and Athenæus, the best Falernian wine was never drank, until it had attained the age of ten years, and never after the age of twenty.

The Alban wines required the age of twenty years, the Surrentine twenty-five, &c. Macrobius relates that Cicero, being at supper with Damisippus, was treated with Falernian wine of forty years, which Cicero praised by observing that it bore its age well: (*benè, inquit, ætatem fert.*) Pliny speaks of wine served up at the table of Caligula which was more than 160 years old, and Horace celebrates wine of a hundred leaves.

When we consider what historians have left us respecting the origin of the wines possessed by the ancient Romans, it seems doubtful whether their successors have added any thing to their knowledge on that subject. They procured their best wines from Campania, called at present, Terra di Lavori, in the kingdom of Naples. The Falernian and Massic wines were the produced of vineyards planted on the hills

around Mondragon, at the foot of which runs the Garigliano, formerly called the Iris. The wines of Amicla and Fondi were made in the neighbourhood of Gaeta, the grapes of Luessa grew near the sea, &c. But, notwithstanding the great variety of wine produced by the soil of Italy, luxury soon induced the Romans to seek for that of Asia, and their tables were loaded with the valuable wines of Chio, Lesbos, Ephesus, Cos, and Clazomene.

The vine was introduced into Britain by the Romans, and appears to have very soon become common. Few ancient monasteries did not manufacture wine. In an early period of the history of Britain, the Isle of Ely was expressly denominated the Isle of Vines by the Normans. The Bishop of Ely, shortly after the conquest, received at least three or four tons of wine

annually, as tithes from the vines in his diocese, and in his leases he made frequent reservations of a certain quantity of wine by way of rent. Many of them were little inferior to the wines of France in sweetness.

Gaul was totally without vines in the days of Cæsar, yet not only this province, but the interior of the country, was largely stocked so early as the time of Strabo. In the reign of Vespasian, France became famous for her wines, and even exported large quantities to Italy.

In the age of Lucullus, however, even the Romans themselves were seldom able to regale themselves with wine. Italy made but little, and the foreign wines were so expensive, that they were rarely produced even at entertainments, and when they were, every guest was only indulged

with a single draught. But in the seventh century, after the founding of the city, as their conquest augmented the degree of their wealth, and enlarged the sphere of their luxury, wines became an object of particular attention. Wine vaults were then constructed, and gradually became well stocked, and the wines of the country acquired a considerable character.

The Falernian rose immediately into great repute, and especially that of Florence, towards the close of the above century; and the more westerly parts of Europe were at once subjugated by the arms of Italy, and exhilarated by her wines.

SPECIFIC DIFFERENCES, AND COMPONENT PARTS OF WINE.

Every body knows that no product of the arts varies so much as wine; that different countries, and sometimes the different provinces of the same country, produce different wines. These differences, no doubt, must be attributed chiefly to the climate in which the vineyard is situated—to its culture—the quantity of sugar contained in the grape juice—the manufacture of the wine, or the mode of suffering its fermentation to be accomplished. If the grapes be gathered unripe, the wine abounds with acid; but if the fruit be gathered ripe, the wine will be rich. When the proportion of sugar in the grape is sufficient, and the fermentation complete,

the wine is perfect and generous. If the quantity of sugar be too large, part of it remains undecomposed, as the fermentation is languid, and the wine is sweet and luscious; if, on the contrary, it contains, even when full ripe, only a small portion of sugar, the wine is thin and weak; and if it be bottled before the fermentation be completed, part of the sugar remains undecomposed, the fermentation goes on slowly in the bottle, and, on drawing the cork, the wine sparkles in the glass; as, for example, Champagne. Such wines are not sufficiently mature. When the must is separated from the husk of the red grape before it is fermented, the wine has little or no colour: these are called *white* wines. If, on the contrary, the husks are allowed to remain in the must while the fermentation is going on, the alcohol dissolves the

colouring matter of the husks, and the wine is coloured: such are called *red* wines. Hence white wines are often prepared from red grapes, the liquor being drawn off before it has acquired the red colour; for the skin of the grape only gives the colour. Besides in these principal circumstances, wines vary much in flavour.

All wines contain one common and identical principle, from which the similar effects are produced; namely, *brandy* or *alcohol*. It is especially by the different proportions of brandy contained in wines, that they differ much from one another. When wine is distilled, the alcohol readily separates. The spirit thus obtained is well known under the name of *brandy*.

All wines contain also a free acid; hence they turn blue tincture of cabbage, red. The acid found in the greatest abundance

in grape wines, is the tartaric acid. Every wine contains likewise a portion of super-tartrate of potash, and extractive matter, derived from the juice of the grape. These substances deposit slowly in the vessel in which they are kept. To this is owing the improvement of wine from age. Those wines which effervesce or froth, when poured into a glass, contain also carbonic acid, to which their briskness is owing. The peculiar flavour and odour of different kinds of wine, depend upon the presence of a volatile oil so small in quantity that it cannot be separated.

France, of all the countries of the earth, must be pronounced the most opulent in wines.

The best and most admired wines are those prepared from the juice of the grape. The property which this juice possesses of

forming the best wines that are known, does not depend upon its containing the most saccharine matter; for in this point of view the sugar-cane ought to afford it; but upon its saccharine principle being united to a portion of a peculiar species of ferment, in such a manner that there results from them the most homogeneous, the most proper, and the most agreeable vinous combination that can exist, or that which is the most universally pleasing to mankind.

The French wines, called Burgundy, are excellent and much esteemed; their principles are perfectly combined, and none of them predominates; they improve greatly in quality during six or eight years, after which they deteriorate, but very slowly, and in general they keep very well.

The Orleans wines, as they are called, possess qualities very similar to those of Burgundy wines, when time has dissipated their tartness, and intimately combined their principles.

The red wines of Champagne are very delicate; the white wine, which does not sparkle, is greatly preferable to that which does, and which is not sufficiently mature, and has not sufficiently fermented, besides it contains little or no alcohol, and becomes flat when it has lost its carbonic acid.

The wines of Languedoc and Guyenne, are of a deep colour, and very tonic, especially when they are old. Those of Anjou are very spirituous, and soon intoxicate.

The German wines, those of the Rhine and the Moselle, are white, and very full of alcohol; they keep for a long time, and improve much by age. The Italian wines

especially those of Orviette, of Vicenza, the *lachryma Christi*, are well fermented, and considerably resemble the good wines of France.

The wines of Spain and Greece are in general dry, sweet, and little fermented, excepting those of Rota and Alicant, which are reckoned very useful cordials.

Some of the wines of the Cape of Good Hope are perhaps the first and best of all wines. The wine called Constantia, is much esteemed every where. It has been supposed to be the produce only of two farms in the immediate neighbourhood of the Cape; but Mr. Barrow observes, that the same grape, the muscadel, grows on every farm, and that some of the wines made in Drakenstein are equal, or even superior, to those of Constantia. The management, however, is too imperfect to pro-

duce good wine with any degree of certainty. The grapes, ripe and unripe, along with the stalk, are thrown into the press; in consequence of which some acquire a thinness and slight acidity, others a sickly, saccharine taste. The boors and dealers, besides, have not arrived at the knowledge of any enlarged and liberal principles of trade. Besides undergoing various adulterations, the wines are seldom found to correspond to the samples furnished; the native dealers imagining, that when they are once paid and shipped, nothing farther is to be apprehended. The British government, since the last reduction of the Cape, have endeavoured to encourage the cultivation of this wine by reducing the duty to 17*l.* 10*s.* per ton, being not more than a third of that paid by the wines of Spain and Portugal. A considerable quantity has

consequently been imported; but it has not been relished in this country, and unless the quality be very materially improved, does not seem likely to come into general use. It is understood, however, that the London merchants have lately sent out persons skilled in the culture and manufacture of wine, with the view of giving the natives the necessary instructions; and that considerable expectations are entertained of the benefits which may be reaped from this measure.

DISTINCTIVE CHARACTERS OF HOME-MADE WINES.

Home-made wines differ chiefly from foreign or grape wines, in containing a much greater quantity of malic acid, whilst the wine of the grape contains chiefly tartareous acid; for it is the presence of super-tartrate of potash by which the grape is most strongly distinguished from all the other sub-acid fruits applied to the purposes of wine-making. This salt is most abundant in the grape before ripening, and a portion of it disappears during this process. A consideration of this diversity led Dr. Macculloch to point out to the public the useful practice of introducing super-tartrate of potash into all those juices of fruits

which are intended for the basis of home-made wines.

This salt is doubtless decomposed during the fermentative processes, and a considerable quantity of what remains is subsequently deposited in the casks or bottles in which the wine is kept, constituting what is termed the *crust* of the wine.

Few of our home-made wines possess an intense colour, for with the exception of the elderberry, mulberry, and the black cherry, scarcely any colour is contained in our domestic fruits.

GENERAL PRINCIPLES OF THE ART OF MAKING WINE.

PROCESS OF FERMENTATION.

The juice of which wine is made consists of a large proportion of water, holding in solution certain proportions of *saccharine matter*, of the fermentative principle, which appears to be a modification of gluten, of various acids, which in the grape juice is chiefly the tartaric, and in the juice of our fruits, the malic acid, and of various ill-defined *extractive* or mucilaginous *matter*. These principles, when left to themselves for a short time in a medium temperature, soon begin to re-act upon one another, and some of them at length undergo remarkable changes. This process, which is termed *fermentation*, constitutes the grand prin-

ciple of wine-making; it is analogous to the conversion of the wort of malt into beer.* The vinous fermentation scarcely commences, if the temperature be below 60°, but at the temperature of 70° the process goes on briskly.

A large mass is very favourable for promoting the vinous fermentation. A small quantity of saccharine matter scarcely at all undergoes this change, while it runs speedily to the acid fermentation.

When the before-mentioned substances are placed in proper circumstances, the process commences in a few hours, or a few days, according to the temperature, the richness, and quantity of mass employed. The liquid becomes agitated with an intestine motion; it also becomes thick

* See a Treatise on the Art of Brewing, exhibiting the London practice of Brewing Porter, Ale, Brown Stout, and other Malt Liquors, 1820, p. 76.

and muddy; the temperature rises, and carbonic acid gas is disengaged. The liquid is increased in bulk, and the surface becomes covered with a voluminous frothy matter, which is owing to the carbonic acid gas adhering for some time to the viscid yeast in the liquid. The quantity of carbonic acid gas disengaged during the process is very considerable; it begins to be evolved at the commencement of the fermentation, and continues till its termination. At the end of a few days, or after a longer or shorter time, according to the temperature and other circumstances, the fermentation ceases. The liquid becomes transparent, the matters which occasioned the muddiness having precipitated to the bottom, and the liquor, from having a sweet taste, becomes vinous; and from having been viscid

and glutinous, it becomes more liquid and lighter. It is now converted into wine.

Such are the phenomena of fermentation, from which, and from the nature of the product, very considerable changes must have taken place in the component parts. One change is very obvious during this process, namely, that the quantity of sugar is always diminishing, and that at the end of the process it has entirely disappeared. The liquid is now more fluid, is specifically lighter, and has obtained a spirituous taste; which new properties are ascribed to the formation of alcohol which exists in the wine. It appears that it is the sugar only which has suffered decomposition. It is divided into two portions, one of which separates, and is carried off in the form of carbonic acid gas, while the other, containing a greater proportion of hydrogen,

remains in the liquid, in the form of alcohol. Part of the alcohol is carried off also, and the alcohol which remains in the liquid is combined with the acids and colouring matter of the wine. The tartaric acid, it has also been found, is partially decomposed during the process, and a portion of malic acid is formed. It appears from other experiments, that azotic gas is also disengaged during this process, from which it is inferred, that some others of the constituents of the fermenting liquid must have been decomposed, since sugar contains no azote.

When this process has taken place, the wine is introduced into casks, where it undergoes further changes, and is matured by a modification of the fermentative process, which has been called the *insensible fermentation*. Soon after the

wine has been put into the cask, a slight hissing is heard, which arises from the continued disengagement of carbonic acid gas that escapes from every point of the liquor; some froth also passes through the bung-hole, and care must now be taken to keep the cask always full, that the froth may escape, and that the wine may become perfected; whilst this is going on, it will be sufficient to fasten a piece of paper over the bung-hole, or to lay a tile over it.

In proportion as the insensible fermentation decreases, the liquid sinks down; and this depression must be carefully watched, in order to pour in, from time to time, more wine, that the casks may be always kept full.

This is a most important step in the process of wine making, as by different modes

of management in this last stage almost the whole of that infinite variety which exists among wines is produced. Here also it is, that all foreign substances designed to impart a flavour to the wine, are in general introduced with the greatest propriety.

RACKING AND SULPHURING OF WINE.

When the insensible fermentation has been carried to the point desired, it is checked by *racking*, that is, drawing off the wine from its lees; and, to prevent a new fermentation taking place, the cask is sulphured by burning in it a piece of linen cloth, dipped in melted sulphur. The sweet taste of some wines arises from the presence of too much saccharine matter, and may be generally remedied by prolonging the fer-

mentation. On the contrary, when the fermentation has been carried so far as to decompose the whole of the sugar, the wine is said to be *dry;* and if the original quantity of sugar has been rather defective, it has a strong tendency to become sour.

The astringent taste and *colour* of red wines are derived from the husks of the fruit; and when it is wished to impart these qualities in a higher degree, the manufacturers sometimes mix a certain portion of high coloured grapes with the other fruit.

In Madeira, as well as those wines of Xeres and San Lucar, it is the practice to produce a nutty flavour, by the addition of bitter almonds. Raspberries, orris-root, clary, and elder flowers, may be employed for giving particular flavours to home-made wines. In using these different articles,

the best practice is to suspend the flavouring ingredients in the cask a few days, during the period of the insensible fermentation, by which means their flavour is retained without a chance of being dissipated.*

When the strength of wine is deficient, brandy is customarily added in a more or less quantity; and to render the combination of this more complete, Dr. Macculloch very properly advises to add the spirit while the insensible fermentation is going on.

The colouring of home-made wines may be effected by bilberries, mulberries, or the husks of elderberries; these substances impart a fine red colour to vinous fluids; they are sometimes suffered to ferment

* See a Treatise on the Art of Brewing, exhibiting the London Practice of brewing Porter, Brown Stout, Ale, and other kinds of Malt Liquors, 1820, page 224.

with the *must* to render the colour more intense.

BARRELLING OF THE WINE.

When the wine has been completed, it is drawn off upon clean dry casks.

That the wine may keep, and improve in quality, it is best to put it into vessels deposited in cool places. Glass bottles are the most favourable, because, besides their presenting no principle soluble in wine, they shelter it best from the contact of the air, and the principal variations of the atmosphere. Care must be taken to stop the bottles very closely with good cork, and to lay them on their sides, that the cork may not dry, and facilitate

the access of the air. For the greater safety the cork may be covered with a coating of cement, applied by means of a brush, or the neck of the bottle may be immersed in a mixture of melted wax, resin, and pitch.

An eminent wine-merchant assures me, that the amelioration of wine, from age, is best and more rapidly effected by keeping the wine, not in bottles, but in casks, constantly kept full; for the separation of a portion of super-tartrate of potash takes place more rapidly when the wine is in the cask, than in glass vessels. Every one has heard of the enormous capacity of the tun of Heidelberg, in which wine is preserved for whole centuries, always improving in quality; and it is also allowed that wine keeps better in very large casks than in small ones.

CLARIFICATION OF THE WINE.

The clarification of wine is effected spontaneously by time and repose; for there is gradually formed a deposit at the bottom of the cask and on the sides, which frees the wine from every thing not in absolute solution in it, or which is in it in excess. This deposit, called the lees of wine, is a mixture of super-tartrate of potash, yeast, gluten, and colouring matter.

But these substances, though deposited in the cask, and precipitated from the wine, are susceptible from being still mixed with it by agitation, or by a change of temperature; and in that case, besides injuring the quality of the wine, which they render turbid, they may communicate to it a new fermen-

tation, which makes it degenerate into vinegar.

To obviate this inconvenience, the wine is drawn off into other vessels at different periods; all the lees which have been precipitated are carefully separated; and every thing existing in it in a state of incomplete solution is disengaged from it by drawing off the wine upon clean casks.

New-made wine should be as little disturbed as possible. The removal of new wine is always injurious, because it tends to re-establish a new insensible fermentation in the wine.

BRITISH FRUITS, MOST CAPABLE OF BEING CONVERTED INTO WINE.

Besides grapes, of which the most perfect wine is made, there are a number of fruits from which vinous liquors can be obtained. The practice of making wine from the produce of our gardens is deserving of very general attention. Foreign wines are entirely beyond the reach of the poor, and therefore the benevolent will endeavour to supply them, in age and sickness, with the best substitutes which our native fruits will afford.

The following domestic fruits are well calculated for the fabrication of wine:— The gooseberry, elderberry, mulberry, raspberry, blackberry, strawberry, red

currant, black currant, white currant, and cranberry. These ferment well, and afford good and wholesome wines. It is a vulgar prejudice to suppose, that the wine made from domestic fruits are unwholesome. They may disagree with the constitutions of some persons, but no fact can warrant the assertion that they are more injurious than wine made from the grape.

The pulpy indigenous fruits, such as the peach, nectarine, plum, cherry, damson, and apricot, may also be employed; but, upon the whole, they answer not so well for the fabrication of wine as the sub-acid esculent berries.

The gooseberry and currant are, of all other fruits, most commonly employed in the fabrication of home-made wines; and, upon the whole, they are best adapted for the purpose. When used in their green

state, they may be made to form light brisk wines, falling little short of Champagne.

Ripe gooseberries are capable of making sweet or *dry* wine; but these are commonly ill flavoured, particularly if the husk has not been carefully excluded.

Ripe currants, if properly managed, make a much better wine than gooseberries. These fruits are much improved, according to Dr. Macculloch, by boiling the juice, for a few minutes, previously to fermentation. This is particularly the case with the black currant, which, when thus managed, is capable of making a wine closely resembling some of the best of the sweet Cape wines.

The strawberry and raspberry are capable of making both *dry* and sweet wines of an agreeable quality.

The elderberry is well calculated for making an excellent red wine. Its cheap-

ness also recommends it. It does not, indeed, possess any great degree of flavour, but it possesses no bad one, which is a negative property often of great importance in artificial wine making.

The cherry produces a wine of no very peculiar character. If used, care should be taken not to bruise too many of the stones, otherwise a disagreeable bitter taste will be imparted to the wine.

The blackberry and mulberry are capable of making coloured wines, if managed with that view; they are deficient, however, in the astringent principle; nevertheless, they may be occasionally employed with advantage when a particular object is to be gained.

The sloe and damson are so associated in qualities, that nearly the same results are obtained from both. Their juice is

acid and astringent; and hence they are qualified only for making *dry* wines. By a due admixture of currants or elderberries with sloes or damsons, wines not much unlike the inferior kinds of port are often produced.

Grapes, of British growth, are capable of making excellent sparkling and other wines, by the addition of sugar. I have made wine from immature grapes and sugar, which so closely resembles the wines called Grave, and Moselle, that the best judges could not 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.

Dr. Macculloch informs us, that the cottagers in Sussex are in the habit of making wine, almost annually, from the produce of

vines trained on the walls of their houses. Many individuals, through various parts of the southern counties, and even as far north as Derbyshire, practice the same with success. But the experiment is well known to have been made for many years on a large scale, and with complete results, at Pain's Hill, by the Hon. Charles Hamilton, in a situation, with respect to soil and exposure of which, parallel instances are to be found throughout the country, and produced from land of no value whatever for the ordinary purposes of agriculture.

Raisins are extensively used in this country for making domestic wines, therefore they deserve to be mentioned here. When properly managed, they are capable of making a pure and flavourless vinous fluid, well adapted for receiving any

flavour which may be required, and thus of imitating many wines of foreign growth.

The orange and lemon are likewise used for making domestic wines. Upon the whole, however, they are not very well adapted for the purpose, as they contain too much acid, and too little of the extractive and of the sweet or fermentative principle.

The apricot, peach, and quince, from its analogy to the apple and pear, is better qualified for making a species of cyder than wine.

ART OF MAKING WINE FROM NATIVE FRUITS.

We start upon the grounds that home-made wines are intended to be imitations of foreign wines. In the first place, therefore, we have to prepare a juice or *must* similar to the juice or *must* of the grape in its general composition. Now, no fruit whatever yields a juice precisely similar to that of the grape. In our northern climate more especially, the saccharine principle, which is the fundamental basis in wine-making, exists only in very minute proportions in most fruits. It must therefore be supplied artificially. The tartaric acid, or rather super-tartrate of potash, which is another essential principle in wine-making, is likewise wanting in most of our fruits.

This therefore must also be supplied. On the contrary, other substances, and particularly malic acid, exist in too large a proportion in most of our fruits, which, in their natural state, are thus better adapted for making cider than wine. To get rid of the malic acid, and to prevent its deteriorating quality, as well as the deteriorating effects of other foreign principles, is difficult, or perhaps impossible; and this will doubtless always render home-made wines inferior to those of the grape, though very near approaches may be made by judicious management.

The practical mode of obviating these difficulties is to dilute the juice of the fruit to such a degree, that a given quantity of it shall contain no more of the malic acid, or nearly so, than a given quantity of the juice of the grape; and, as before observed,

to supply artificially the two grand principles, sugar, and super-tartrate of potash, which are wanting. Having thus prepared an artificial *must*, as nearly resembling in its composition that of the grape as possible, the application of the other principles will be obvious, as we have nothing to do but to manage, in general, all the subsequent processes precisely as if we were operating upon the must of the grape.

From what has been said (page 23) of the manufacture of wine from grapes, our readers will observe, that different methods are pursued according to the kind of wine which we intend to make. Now, these remarks are equally applicable to home-made wines, in the manufacture of which it is absolutely necessary that the maker should determine before-hand upon the kind of wine which it is his object to pro-

duce, and to modify his processes accordingly. We may, with Dr. Macculloch, consider wines as of four general descriptions: *sweet* wines; *sparkling* or *effervescing* wines; *dry* and *light* wines, analogous to hock, grave, and Rhenish, in which the saccharine principle is entirely decomposed during fermentation; and, lastly, *dry* and *strong* wines, as Madeira and sherry.

Those of the first and most simple class are the *sweet* wines, or those in which the fermentative process has been incomplete. It is to this class that by far the greater number of our home-made wines bear the greatest resemblance; a resemblance, says Dr. Macculloch, so general, as to shew that few makers of this article possess sufficient knowledge of the art to enable themselves to steer clear of what may be

fairly called the radical defect of domestic wines; for so large a quantity of sugar is often added to a proportion of the juice of the fruits, that the quantity of natural *leaven*, or fermentative matter in the compound, is insufficient for the conversion of the whole of the sugar into wine; hence, that part of it which remains undecomposed is *sweet*. The use of the artificial *leaven*, or yeast, may in some measure correct this defect, but the quantity added is generally inadequate to this object.

ERROR WITH REGARD TO THE USE OF BRANDY IN THE FABRICATION OF BRITISH WINES.

"The addition of spirit, so often recommended in the recipes for making fruit wines, so far from checking the wine from becoming sour, increases the tendency, and therefore the use of brandy, as a *preservative* to wine, is founded in error. This view* is opposed to all popular opinions and practices, opinions most assuredly founded on erroneous and vague analogies, drawn from some supposed preservative power residing in spirit. It is the more particular in calling to this subject the attention of those who may engage in the manufacture of domestic wines, because a

* Macculloch on Wine, page 156.

notion is prevalent, that these wines are, above all others, deficient in durability, and cannot exist without this admixture.

"The effect, on the contrary, is to destroy the briskness of these wines, often the only meritorious quality they possess, while it increases their expense and diminishes their salubrity. If taste or prejudice require that wine should be stronger than it can be made naturally, or if for cotemporary purposes it is desirable to mix brandy with wine, it may be done, but under certain restrictions, and after it is completed, it then merely produces a mixture, in which the brandy is not only generally to be distinguished by an accurate palate, but in which all the evil effects are most conspicuous. To render this mixture more complete, and less injurious, it should be made while the process

of fermentation is still going on. The most convenient time will be during the insensible fermentation, which takes place in the cask. By this method a portion at least of the added spirit enters into permanent combination with the wine, in consequence of its having undergone the action of the fermenting process; and the injury to that quality of the wine is the least possible."

Dr. Macculloch recommends to add a proportion of *crude tartar;* the dose of which may vary from one to six *per cent.* without materially affecting the wine, as a great proportion of what escapes decomposition will be subsequently deposited. All fruits, except the grape, will require more or less of this salt.

In the manufacture of home-made wines, care therefore should be taken not to use too small a proportion of fruit, compared

with the sugar employed; for it is this circumstance chiefly which renders the fermentative process incomplete, and thus imparts that sweet and mawkish taste to our domestic wines, which renders them intolerable to many people, and even to all, perhaps, without the addition of brandy.

The strength of the wine is always proportional to the quantity of sugar employed, provided that sugar has been completely decomposed. The most saccharine juices, therefore, afford the strongest wine; or, in the practice which is necessary in making wine from native fruits, that fluid will produce the strongest wine to which the greatest quantity of sugar has been added previously to the fermentation, care being always taken to increase the quantity of leaven in such a ratio as to insure the complete decomposition of the sugar, without

which the produce gains in sweetness only, without acquiring additional strength. But even with this precaution, there is a limit to the quantity of sugar that can be employed, and this limit is obviously the proportion of water which is required to ensure the fermenting process. The fermentation must continue the longer if it is desired that the produce shall be a dry wine, and for a less time if it is wished to procure a sweet wine. But if, on the contrary, it is the wish of the operator to preserve the flavour or *bouquet* of the wine, it is necessary that the period of the fermentation should be shortened. The case will be precisely the same if it is an object to have a brisk wine, as the carbonic acid, on which this quality exclusively depends, will be dissipated irrecoverably by an undue protraction of the fermenting process.

METHOD OF MAKING GOOSEBERRY WINE.

Take 50 lbs. of immature gooseberries, freed from the remains of the blossoms and fruit stalks, bruise them in successive portions in a wooden tub, (or by means of the mill exhibited on the title page), without much compressing the husks, or bruising the seeds; dilute the mass with four gallons of water, and after having suffered it to stand for ten or twelve hours, put it into a coarse canvas bag, and squeeze out the liquor.

Pour upon the residue one gallon of water, suffer it to macerate for twelve hours, and then press it out, and add the product to the before obtained juice. Put the whole of the liquor into a tub, and add

to it from 30 to 40lbs. of white loaf sugar, according to the desired strength and sweetness of the wine, and 1lb. of finely pulverised crude super-tartrate of potash.

Stir this mixture, and make up the total bulk of the fluid with water, to the amount of 10½ gallons, cover it with a blanket or sacking, and let it stand in a moderately warm place.

In a day or two the fluid will begin to ferment, and when the yeasty froth, which appears on the surface, has assumed an uniform texture, skim it off, and repeat the skimming from time to time till no more yeast becomes separated. When the fermentation has so far been completed, draw off the liquor from the dregs, or lees, into a cask, which must be completely filled with the wine.

A small quantity of yeast will still con-

tinue to become separated, and overflow the bung hole, in consequence of the slow fermentation in the cask, and hence the quantity of liquor diminishes; the loss thus sustained must be made up by adding, from time to time, a portion of the liquor which was made for that purpose, so as to keep the cask always filled up to the bung hole.

When the fermentation has nearly ceased, the bung may be put loosely into its place, but a small hole must be bored by the side of the bung hole, and loosely fitted with a peg to give vent for the extrication of the carbonic acid that may become developed. When no farther froth appears, the vent peg must be withdrawn, the spile may then be tightened, and the cask left undisturbed for five or six months; after which time the wine should be drawn off from its lees into another cask; and if it is not fine,

it may be rendered so by the addition of a small quantity of isinglass dissolved in water, which will render it clear in a few days, after which it may be bottled and stored in a cool cellar.

Should the wine be too sweet, the fermentation, (before it is drawn off from its lees), may be re-excited by stirring up the contents of the cask, and suffering it to repose in a warm place. By this means an additional portion of the undecomposed sugar which it contains will disappear. The wines may then be decanted. Sometimes it is requisite to decant it a second time into a clean cask, after it has been suffered to stand two months. In any case it must be bottled during the month of March, provided that the wine is become perfectly clear; if not, some mistake has been committed in the manufacture of it.

WINE FROM MATURE GOOSEBERRIES OR CURRANTS.

Wine from ripe gooseberries may be made in a similar manner to what has been just stated. But the produce of the ripe fruit is always ill-flavoured, nor can it be rendered palatable, unless, perhaps, by a most careful exclusion of the husks and seeds. The wine obtainable from ripe gooseberries or currants may be made either *sweet* or *dry*. The rules immediately preceding, which relate to the management of the fermentation and raking of the wine, require equally to be attended to in this case. If the wine be intended to be sweet, the quantity of fruit should not exceed 40 lbs. if dry wine is desired, it may extend to 60 lbs,

the proportion of sugar being 30lbs. If a much stronger wine of either quality is desired, the quantity of sugar may be extended to 40lbs.

BRISK GOOSEBERRY WINE.

Let 40lbs. of unripe gooseberries be mashed, and having poured upon the mass one gallon of water, squeeze out the juice, add to it 12lbs. of lump sugar, and six ounces of super-tartrate of potash, previously reduced to a fine powder; suffer the liquor to ferment in a tub for about two days only, and then transfer it into a cask, and attend to the process of replenishing the waste liquor by filling up the cask from time to time, till the fermentation has so far subsided, that the hissing noise which

is heard at the bung hole is but slightly perceptible. The bung of the cask may then be fastened down, and also the spile, and the cask left undisturbed, in a cool cellar, till the month of November, at which time the clear liquor should be raked off into a cask and bottled.

Another method is the following:— Bruise unripe gooseberries, and let them stand twelve hours, squeeze out the juice, and having strained it through a sieve to separate the seeds, measure its volume, and add to every three pints of the liquor one pound and a half of loaf sugar; suffer it to ferment, and when perfectly bright, which will be in about three months, bottle it off. Or bruise the gooseberries, and add to every gallon of the bruised berries one gallon of water, stir this mixture, and after having stood about twelve hours, strain the

mass through a coarse cloth, or hair sieve. Add to every gallon of the juice, 4lbs. of loaf sugar, put the liquor into a cask, and suffer it to ferment. When the fermentation has nearly ceased, draw off the liquor from the sediment, rince out the cask, and to every gallon of the fluid add half a pound of sugar, put it again into the cask; bung it up for about six weeks, after which time it will be fit for bottling.

The husk of the gooseberry, or the whole of the *marc*, as well as the juice, may be fermented together in the vat along with the sugar in the first stage of the process. The fermentation will thus be more rapid and the wine prove stronger and less sweet, but it will acquire more flavour.

BRISK CURRANT WINE.

Let the currants be gathered when they have nearly attained their full growth, but before they have shewn much tendency to ripen; separate the berries from the stalks, mash the fruit, and let all the preliminary processes for obtaining the juice be conducted precisely in the same manner as described in the method for making brisk gooseberry wine; add the same proportion of sugar and super-tartrate of potash. The fermentation and further treatment of the wine should also be similar to what has been stated under the head *Brisk Gooseberry Wine*, page 66.

BRISK GRAPE WINE.

As no bad flavour is communicated by the husk, or even by the stems of the grape, this fruit may be safely taken in any stage of ripeness in which it is most conveniently obtained, nor is it necessary to attend to the selection of any particular variety of the grape. Unripe grapes may be obtained where the vine is largely cultivated, from the thinning usually practised on the bunches in this country where the vines are under cover. In this case, that fruit raised out of doors is to be used. Dr. Macculloch recommends to wait till the grapes shew a tendency to ripen, or till the advance of the cold season shews that no further change can be expected. The method of making brisk grape wine, is as follows :

Bruise the grapes into a pulp with a wooden pestle, or thick flat piece of board fastened to the end of a staff, taking care to bruise the stones as little as possible.

The proportions of sugar to be employed and the treatment, are precisely similar to those laid down for the fabrication of gooseberry wine. It may only be added, that the husks may be fermented in the cask with the fluid, since the grape skins give no bad properties, and since the stems, during the period of immaturity, have not acquired any offensive astringency, while they add, at the same time to the quantity of the vegetable extract, or glutinous matter, which is essential to the constitution of the wine.

The fruit mill and press, exhibited on the title-page, is very convenient for bruising this as well as all other kind of fruits calculated for home-made wines.

BRISK WINE FROM THE LEAVES AND TENDRILS OF THE VINE.

An excellent brisk wine may be made from the leaves and tendrils of the vine. The leaves are best when young, at farthest they should not have attained their full growth, and they should be plucked with their stems. To make ten gallons of wine, Dr. Macculloch directs to pour seven or eight gallons of boiling water upon 40 or 50 lbs. of the leaves into a tub of sufficient capacity, and to suffer the leaves to macerate for 24 hours. The liquor being poured off, the leaves must be submitted to a press of considerable power, and being subsequently washed with an additional gallon of water, they must again be pressed. The quantity

of sugar to be employed may vary as in the former receipts from 25 to 30 lbs. and the quantity being made up to ten gallons and a half, the process recommended for making gooseberry wine is to be followed.

BLACK CURRANT WINE.

Take black currants when they begin to turn ripe, strip the berries from the stalks, mash them in a wooden tub; let the mass stand 24 hours, and press the juice through a coarse bag or sieve. Pour upon the mass a small portion of water, let it stand in a tub for twelve hours, and having squeezed out the liquor, add it to the before-obtained juice. To one gallon of the diluted juice, add from four to five pounds of loaf sugar (3 lbs. of sugar is the

smallest quantity that should be added to every gallon of the diluted juice), and put the mixture into a cask, which it should completely fill. Suffer the fluid to ferment: and, when the fermentation begins to slacken, which may be known by a diminution of the hissing noise, let the bung be driven in, and leave open the spile, or wooden peg. After a few days let the peg be loosened again, that if any material quantity of carbonic acid gas has been created it may have vent to escape. The same trial must be made after successive intervals till there appears no longer any danger of excessive expansion; the spile may be then permanently tightened. The wine may be racked when six months old, and bottled when perfectly transparent.

ELDERBERRY WINE.

This fruit is excellently calculated for the production of wine. Its juice contains a considerable portion of the fermentative matter which is so essential for the production of a vigorous fermentation, and its beautiful colour communicates to the wine a rich tint; but as the fruit is deficient in saccharine matter, this substance must be liberally supplied. This wine is much ameliorated by adding to the elderberry juice a small portion of super-tartrate of potash. Dr. Macculloch observes, "that the proportion of this salt may vary from one to four, and even six per cent. The causes of this admissible laxity will appear, when it is considered that the greater part

of the super-tartrate of potash is again deposited in the lees. I may also remark, that from two to four per cent. will be found a sufficient dose, in proportion to the greater or less sweetness of the fruit, the sweetest requiring the largest quantity of this salt, and *vice versa*. The dose of it ought also to vary in proportion to the added sugar, increasing it as this increases."

To every two quarts of bruised berries put one quart of water, strain the juice through a hair sieve, and add to every quart of the diluted juice one pound of lump sugar. Boil the mixture for about one quarter of an hour, and suffer it to ferment in the manner before stated.—*See Gooseberry Wine.*

Or, bruise a bushel of picked elderberries, dilute the mass with ten gallons of water, and having boiled it for a few

minutes, strain off the juice and squeeze out the husks. Measure the whole quantity of the juice, and to every quart put three quarters of a pound of lump sugar; and, whilst still warm, add to it half a pint of yeast, and fill up the cask with some of the reserved liquor.

When the wine is clear it may be drawn off from the lees (which will be in about three months) and bottled for use.

For flavouring the wine, ginger, allspice, or any other aromatic substance may be used: the flavouring materials may be inclosed in a bag, and suspended in the cask, and removed when the desired flavour is produced.

BRITISH GRAPE WINE.

Mash the grapes to form a pulp without breaking the stones; squeeze out the juice, and strain it through a sieve, pour over the husks, or mark, a small quantity of water, let it stand twenty-four hours, and force out the adhering juice. Having done this, add to every gallon of the juice three pounds of lump sugar, suffer the liquor to ferment, and observe the rules pointed out for making gooseberry wine.

RED AND BLACK CURRANT WINE.

A mixture of equal parts of red and black currants makes an excellent wine, superior in flavour to the wine obtained from either of these fruits when in a separate state.

Mash the berries, and having squeezed out the juice, dilute it with a like quantity of water, and to every quart of the diluted juice add one pound of sugar. Put it into a cask, reserving a little for filling up, and place it in a warm situation to ferment, taking care to fill up the cask with the reserved portion of the juice. When it has ceased fermenting, bung it close, and when clear, rake it of its lees, and bottle it.

MULBERRY WINE.

Take mulberries when nearly ripe, bruise them in a tub, and to every quart of the bruised berries put a like quantity of water; let the mixture stand for twenty-four hours, strain it through a coarse sieve, and having added to every gallon of the diluted juice three or four pounds of sugar, suffer it to ferment, and when fine bottle it.

RASPBERRY WINE.

To ten quarts of mashed raspberries add eight quarts of water, let the mixture stand twenty-four hours, strain the mass through a coarse hair sieve, and to every gallon

add from two to three pounds of lump sugar, and suffer it to ferment.

CHERRY WINE.

An excellent wine may be made from cherries in the following manner: Take Morello cherries, not over ripe, picked off from their stalks, mash them in a mortar or pan to detach the pulp without bruising the stones, and suffer the mass to stand twenty-four hours. Press the pulp through a coarse hair sieve, and to every three gallons add from eight to nine pounds of loaf sugar. Put the mixture into a cask, suffer it to ferment, and rake the wine from its lees as soon as it becomes clear. Some manufacturers crack the stones, and hang them, with the bruised kernels, in a bag suspended

from the bung holes, in the cask, during the fermentation of the wine, which thus acquires a nutty flavour.

DAMSON wine may be made in a similar manner.

WINE MADE FROM MIXED FRUITS.

The following method of making an excellent wine is copied from the Bath Society's paper, vol. xi.:

"Take cherries, black currants, white currants, and raspberries, of each an equal quantity, though if the black currants preponderate, the better. To four pounds of the mixed fruit, well bruised, put one gallon of water; let it steep three days and nights in an open vessel, frequently stirring up the mass; then stir it through a hair sieve; the remaining pulp press to dryness: put both liquids together, and in

each gallon of the liquid put three pounds of sugar; let the whole stand again three days and nights, frequently stirring it up as before, after skimming off the top; then turn it into a cask, and let it remain at the bung hole whilst fermenting about two weeks: lastly, to every nine gallons put one quart of good brandy, and then fasten down the bung; if it does not soon become fine, a solution of isinglass may be stirred into the wine."

GINGER WINE.

Dissolve 18 or 20 pounds of sugar in nine and a half gallons of boiling water, and add to it ten or twelve ounces of bruised ginger root. Boil the mixture for about a quarter of an hour, and when nearly cold, add to it half a pint of yeast, and pour it into

a cask to ferment, taking care to fill up the cask from time to time with the surplus of the liquor made for that purpose. When the fermentation ceases, rake off the wine, and bottle it when transparent.

It is a common practice to boil the outer rind of a few lemons together with the ginger destined for the wine, to impart to the wine the flavour of lemon peel.

COWSLIP WINE.

Dissolve 25 pounds of loaf sugar in nine and a half gallons of boiling water; fill with the solution a nine gallon cask, and add to it, whilst still warm, half a pint of ale yeast. (It is a common practice to add also the yellow rind of twelve lemons). Suffer the mixture to ferment, and when the fermentation has nearly ceased (not before) add to it eight or ten handfuls of the petals

of cowslips, and suffer the fermentation to proceed in the usual manner. When the wine is clear, draw it off into bottles. If the flowers be added at the commencement of the fermentation, their flavouring substance is greatly dissipated: whereas, by adding flower petals at the end of the fermentative process, or suspending them for a few days in the cask, their flavour remains combined with the wine.

APRICOT WINE.

Take apricots, when nearly ripe, remove the stones, and bruise the pulp in a mortar. To 8 lbs. of the pulp add a quart of water; suffer the mixture to stand for twenty-four hours, and then squeeze out the juice; add to every gallon of it two pounds of loaf sugar; put it into a cask

and suffer it to ferment, and when perfectly clear, bottle it.

PEACH wine may be made in a like manner.

ORANGE WINE.

As the orange, (and also the lemon), although not a native fruit, is familiar to us, we shall consider them in one view. They differ principally from other fruits in the quantity of their uncombined acid. Take the outer rind of 100 Seville oranges, so thinly pared that no white appears in it, pour upon it ten and a half gallons of boiling water; suffer it to stand for eight or ten hours, and having strained off the liquor, whilst slightly warm, add to it the juice of the pulp, and from 26 to 30 pounds of lump sugar, and a few table

spoonsful of yeast; suffer it to ferment in the cask for about five days, or till the fermentation has apparently ceased, and when the wine is perfectly transparent, draw it off from its lees, and bottle it.

RAISIN WINE.

Upon 24 lbs. of raisins, picked from the stalks, pour six gallons of boiling water, and add six pounds of sugar; let them macerate about 10 or 14 days, stirring it every day; then pour off the liquor, squeeze out the raisins, and add to it three quarters of a pound of finely powdered super-tartrate of potash. Put the liquor into a cask, reserving a sufficient quantity for filling up the cask, and draw off the wine when the fermentation has ceased.

In the Museum Rusticum we have the

following directions for making raisin wine: "put thirty gallons of soft water into a vessel at least one-third bigger than sufficient to contain that quantity; and add to it one hundred and twenty pounds of raisins, picked from their stalks. Mix the whole well together, and cover the vessel with a cloth. When it has stood a little while in a warm place, it will begin to ferment, and must be well stirred about twice in twenty-four hours, for twelve or fourteen days. When the sweetness is nearly gone off, and the fermentation much abated, which will be perceived by the subsiding and rest of the raisins, strain off the fluid, pressing it out of the raisins, first by the hand, and afterwards by a press. Let this liquor be put into a wine-cask, well dried and warmed, adding eight pounds of Lisbon sugar, and a little yeast, and reserving part of the liquor to be added from time to time,

to fill up the casks whilst the fermentation is going on."

A raisin wine, possessing the flavour of Frontaignac, may be made in the following manner :—

Take six pounds of raisins, boil them in six gallons of water, and when perfectly soft, rub them through a cullender, to separate the stones. Add the pulp to the water in which the raisins have been boiled, pour this mixture upon 12 lbs. of white sugar, and suffer it to ferment, with the addition of half a pint of yeast. When the fermentation has nearly ceased, add a quarter of a peck of elder flowers, contained in a bag, which should be suspended in the cask, and removed when the wine has acquired the desired flavour. When the wine has become clear, draw it off into bottles.

QUANTITY OF SPIRIT CONTAINED IN VARIOUS KINDS OF BRITISH WINES.*

	Proportion of Spirit per cent. by measure.		Proportion of Spirit per cent by measure.
Grape Wine	18,11	Tokay	9,88
Gooseberry Wine	11,84	Elder Wine	9,87
Currant Wine . .	20,55		

QUANTITY OF SPIRIT CONTAINED IN VARIOUS KINDS OF FOREIGN WINES.†

Lissa	26,47	Marcella	25,05
Ditto	24,35	Average . . .	25,09
Average . . .	25,41	Madeira	24,42
Raisin Wine . . .	26,40	Ditto	23,93
Ditto.	25,77	Ditto (Sercial) . .	21,40
Ditto	23,30	Ditto	19,24
Average . . .	25,12	Average . . .	22,27
Marcella	26,03	Port	25,83

* See Philosophical Trans. 1811, p. 345; 1813, p. 87.

† Journal of Science and the Arts, No. VIII. p. 290.

Port	24,29	Cape Madeira	22,94
Ditto	23,71	Ditto	20,50
Ditto	23,39	Ditto	18,11
Ditto	22,30	Average	20,51
Ditto	21,40	Calcavella	19,20
Ditto	19,96	Ditto	18,10
Average	22,96	Average	18,65
Sherry	19,81	Vidonia	19,25
Ditto	19,83	Alba Flora	17,26
Ditto	18,79	Malaga	17,26
Ditto	18,25	Hermitage (White)	17,43
Average	19,17	Roussillon	19,00
Teneriffe	19,79	Ditto	17,20
Colares	19,75	Average	18,13
Lachryma Christi	19,70	Claret	17,11
Constantia (White)	19,75	Ditto	16,32
Ditto (Red)	18,92	Ditto	14,08
Lisbon	18,94	Ditto	12,91
Malaga (1666)	18,94	Average	15,10
Bucellas	18,49	Malmsey Madeira	16,40
Red Medeira	22,30	Lunel	15,52
Ditto	18,40	Sheraaz	15,52
Average	20,35	Syracuse	15,28
Cape Muschat	18,25	Sauterne	14,22

Burgundy	16,60	Champagne (Still)	13,80
Ditto	15,22	Ditto (Sparkling)	12,80
Ditto	14,53	Ditto (Red)	12,56
Ditto	11,95	Ditto (ditto)	11,30
Average	14,57	Average	12,61
Hock	14,37	Red Hermitage . .	12,32
Ditto	13,00	Vin de Grave . . .	13,94
Ditto (old in cask)	8,68	Ditto	12,80
Average	12,08	Average	13,37
Nice	14,62	Frontaignac	12,79
Barsac	13,86	Cote Rotie	12,32
Tent	13,30	Orange Wine, aver.	11,26

FINIS.

G. GREEN, LEICESTER STREET,
LEICESTER SQUARE.

NOTICE.

The Public are respectfully informed, that a new Edition, considerably enlarged (price 9s.), has lately been published,

OF

ACCUM'S

Treatise on Adulterations of Food,

AND CULINARY POISONS;

Exhibiting the fraudulent Sophistications of Bread, Beer, Wine, Spirituous Liquors, Tea, Coffee, Cream, Confectionary, Vinegar, Mustard, Pepper, Cheese, Olive Oil, Pickles, and other Articles employed in Domestic Economy; and Method of detecting them.

(Copied from the British Review, No. XXIX. p. 171.)

Mr. Accum seems determined that even the outside of his book shall awaken our fears. The cover of our copy bears a death's head emblazoned upon a pall, and, underneath, the motto "there is death in the pot." The pall is supported by the point of a dart. Four other darts support the four corners of the device. Twelve serpents, with forked tongues and tails entwined, form a terrific wreath around; while the middle is occupied with a large cobweb, delineated with much attention to detail, in the centre of which a spider, full as large as a moderate sized hazel nut, and so frightful that more than one young lady of our acquaintance would think it necessary to scream at the sight of it, holds in its envenomed fangs an ill-fated fly, which is sinking under the loss of blood, and buzzing in the agonies of death.

We are by no means desirous to raise or maintain a popular clamour; but Mr. Accum certainly advances some weighty charges, and his work comes with an advantage in bearing a name not unknown to the scientific world. Of the adulterations specified, some are deleterious, and others merely fraudulent. Accordingly, we shall offer a few extracts, both from the original matter of Mr. Accum, and from his citations drawn from previous authors.

"Among the number of substances used in domestic economy which are now very generally found sophisticated, may be distinguished,—tea, coffee, bread, beer, wine, spirituous liquors, salad oil, pepper, vinegar, mustard, cream, and other articles of subsistence. Indeed it would be difficult to mention a single article of food which is not to be met with in an adulterated state. And there are some substances which are scarcely ever to be procured genuine." (P. 3.)

But we pass on from the general statements at the beginning of the work to particulars.

Water, by standing in leaden reservoirs, acquires a highly deleterious property.

In some particular cases, the consequences have been most fatal.

"'A gentleman was the father of a numerous offspring, having had one and twenty children, of whom eight died young, and thirteen survived their parents. During their infancy, and indeed *until they had quitted the place of their usual residence, they were all remarkably unhealthy*, being particularly subject to disorders of the stomach and bowels. The father, during many years, was paralytic; the mother, for a long time was subject to cholics and bilious obstructions.'" (P. 78, 79.)

These effects were traced to a leaden pump, in the cylinder of which there were found several perforations, while the cistern "was reduced to the thinness of common brown paper, and was full of holes like a sieve." (P. 79.)

We now come to the adulteration of wine; to many of our readers, probably, a far more interesting concern than that of water.

"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, feint colour; that gypsom 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 seeds 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." (P. 95,—97.)

"The particular and separate department in this factitious 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 chrystallize within them." (P. 101, 102.)

But the crusting is not confined to the bottle.

"A correspondent operation is performed on the wooden cask; the whole interior of which is stained artificially with a chrystalline crust of super-tartrate of potash, artfully affixed 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 chrystalline 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." (P. 103, 104)

This our readers will excuse, for it is pleasing to read of imp-ositions which are practised on the sagacious. But, says Mr. Accum,

"Several well-authenticated facts have convinced me, that the adulteration of wine with substances deleterious to health is certainly practised oftener than is, perhaps, suspected." (P. 104, 105.)

Presently follows the story of the passengers by the coach, who dined at Newark. Half a bottle of port made them all ill, one dangerously. Part of the other half caused the death of an inhabitant of the place, on whom an inquest was held, and a verdict returned, of—*Died by poison.*

A gentleman having been taken severely ill on two successive days, after drinking each day a pint of Madeira from the same bottle, his apothecary ordered that it should be examined.

"'The bottle happened to slip out of the hand of the servant, disclosed a row of shot wedged forcibly into the angular bent-up circumference of it. On examining the beads of shot, they crumbled into dust, the outer crust (defended by a coat of black lead with which the shot is glazed) being alone unacted on, whilst the remainder of the metal was dissolved. The wine, therefore, had become contaminated with *lead and arsenic*, the shot being a compound of these metals, which no doubt had produced the mischief.'" (P. 113, 114.)

For detecting the presence of lead or any other deleterious metal in wine, Mr. Accum recommends the *wine test.*

We now come to that part of the subject, which, as *some persons* have thought, *is merely the business of ale-drinkers*, and their brethren, the porter-drinkers.

"The fraud of imparting to porter and ale an intoxicating quality by narcotic substances, appears to have flourished during the period of the late French war. For, if we examine the importation lists of drugs, it will be noticed that the quantities of cocculus indicus imported in a given time prior to that period, will bear no comparison with the quantity imported in the same space of time during the war, although an additional duty was laid upon this commodity. Such has been the amount brought into this country in five years, that it far exceeds the quantity imported during twelve years anterior to the above epoch. The price of this drug has risen within these ten years from two shillings to seven shillings the pound. . . . It was at the period to which we have alluded that the preparation of an extract of cocculus indicus first appeared, as a new saleable commodity, in the price-currents of *brewers' druggists*. It was at the same time also that a Mr. Jackson, of notorious memory, fell upon the idea of brewing beer from various drugs, without any malt and hops. This chemist did not turn brewer himself, but he struck out the more profitable trade of teaching his mystery to the brewers for a handsome fee. From that time forward, written directions and receipt books, for using the chemical preparations to be substituted for malt and hops, were respectively sold. And many adepts soon afterwards appeared every where to instruct brewers in the nefarious practice first pointed out by Mr. Jackson. From that time, also, the fraternity of brewers' chemists took its rise. They made it their chief business to send

travellers all over the country with lists and samples exhibiting the price and quality of the articles manufactured by them for the use of brewers only. Their trade spread far and wide, but it was amongst the country brewers chiefly that they found the most customers. And it is among them up to the present day, as I am assured by some of these operators, on whose veracity I can rely, that the greatest quantities of unlawful ingredients are sold." (P. 157—160.)

Part of these evils the porter-drinkers bring upon themselves.

"One of the qualities of good porter, is, that it should bear *a fine frothy head*, as it is technically termed: because professed judges of this beverage, would not pronounce the liquor excellent, although it possessed all other good qualities of porter, without this requisite.—To impart to porter this property of frothing when poured from one vessel into another, or to produce what is also termed a *cauliflower head*, the mixture called *beer-heading*, composed of common green vitriol (sulphate of iron) alum and salt, is added. This addition to the beer is generally made by the publicans." (P. 182, 183.) It is added in a note:—"'Alum gives likewise a smack of age to beer, and is penetrating to the palate.'—*S. Child on Brewing*, p 18." "The great London brewers, it appears, believe that the publicans alone adulterate the beer." (P. 211.)

"Capsicum and grains of paradise, two highly acrid substances, are employed to give a pungent taste to weak insipid beer. Of late, a concentrated tincture of these articles, to be used for a similar purpose, and possessing a powerful effect, has appeared in the price-currents of brewers' druggists. Ginger root, coriander seed, and orange peels, are employed as flavouring substances chiefly by the ale brewers." (P. 184, 185.)

We find the following articles, in a list of illegal ingredients, seized at various breweries and brewers' druggists.

"Multum, 84 lbs.; cocculus indicus, 12 lbs.; colouring, 4 galls: honey, about 180 lbs.; hartshorn shavings, 14 lbs.; Spanish juice, 46 lbs.; orange powder, 17 lbs.; ginger, 56 lbs.; grains of paradise, 44 lbs.; quassia, 10 lbs.; liquorice, 64 lbs.; carraway seeds, 40 lbs.; multum, 26 lbs." "Capsicum, 88 lbs.; copperas, 310 lbs.; colouring and drugs, 84 lbs.; mixed drugs, 240 lbs.; coriander seed, 2 lbs.; beer colouring, 24 gallons." (P. 186—189.) [The list which includes these articles is copied from the minutes of the committee of the House of Commons.]

Some of the substances above enumerated may be thought comparatively harmless. But others are absolutely poisonous.

"To increase the intoxicating quality of beer, the deleterious vegetable substance, called *cocculus indicus*, and the extract of this poisonous berry, technically called *black extract*, or by some, *hard multum*, are employed. Opium, tobacco, nux vomica, and extracts of poppies, have also been used.—This fraud constitutes by far the most censurable offence committed by unprincipled brewers. And it is a lamentable reflection to behold so great a number of brewers prosecuted, and convicted of this crime. Nor is it less deplorable to find the names of druggists, eminent in trade, implicated in the fraud, by selling the unlawful ingredients to brewers for fraudulent purposes." (P. 205, 206.)

Then follows a list of thirty-four convictions of brewers, for receiving or using illegal ingredients.—We perfectly agree with the following observations.

"That a minute portion of an unwholesome ingredient, daily taken in beer, cannot fail to be productive of mischief, admits of no doubt: and there is reason to believe that a small quantity of a narcotic substance (and cocculus indicus is

a powerful narcotic), daily taken into the stomach, together with an intoxicating liquor, is highly more efficacious than it would be without the liquor. The effect may be gradual; and a strong constitution, especially if it be assisted with constant and hard labour, may counteract the destructive consequences perhaps for many years. But it never fails to shew its baneful effects at last." (P. 209, 210.)

We now come to the business of another small portion of the community, namely, the *tea-drinkers*. Perhaps the following descriptions will assist them in forming a diagnosis.

"All the samples of spurious green tea (nineteen in number) which I have examined, were coloured with carbonate of copper, (a poisonous substance), and not by means of verdigrise, or copperas." (P. 240.) "Mr. Twining asserts, that 'the leaves of spurious tea are boiled in a copper, with copperas and sheep's dung.'" (P. 240. Note.) "Tea rendered poisonous by carbonate of copper, speedily imparts to liquid ammonia, a fine sapphire blue tinge. It is only necessary to shake up in a stopped vial, for a few minutes, a tea-spoonful of the suspected leaves, with about two table-spoonsful of liquid ammonia, diluted with half its bulk of water. The supernatant liquid will exhibit a fine blue colour, if the minutest quantity of copper be present. Green tea, coloured with carbonate of copper, when thrown into water impregnated with sulphuretted hydrogen gas, immediately acquires a black colour. Genuine green tea, suffers no change from the action of these tests." (P. 241.)

The following extracts may perhaps prove interesting to *brandy-drinkers*.

"'It is a custom among retailing distillers, which I have not taken notice of in this directory, to put one third or one fourth part of proof molasses brandy, proportionably, to what rum they dispose of; which cannot be distinguished, but by an extraordinary palate, and does not at all lessen the body or proof of the goods; but makes them about two shillings a gallon cheaper; and must be well mixed and incorporated together in your retailing cask. But you should keep some of the best rum, not adulterated, to please your customers, whose judgment and palate must be humoured.—When you are to draw a sample of goods to show a person that has judgment in the proof, do not draw your goods into a phial to be tasted, or make experiment of the strength thereof that way, because the proof will not hold except the goods be exceedingly strong. But draw the pattern of goods either into a glass from the cock, to run very small, or rather draw off a small quantity into a little pewter pot, and pour it into your glass, extending your pot as high above the glass as you can without wasting it, which makes the goods carry a better head abundantly, than if the same goods were to be put and tried in a phial.—You must be so prudent as to make a distinction of the persons you have to deal with. What goods you sell to gentlemen for their own use, who require a great deal of attendance, and as much for time of payment, you must take a considerably greater price than of others; what goods you sell to persons where you believe there is a manifest, or at least some hazard of your money, you may safely sell for more than common profit; what goods you sell to the poor, especially medicinally, (as many of your goods are sanative), be as compassionate as the cases require.—All brandies, whether French, Spanish, or English, being proof goods, will admit of one pint of *liquor' (water)* 'to each gallon, to be made up and incorporated therewith in your cask, for retail, or selling smaller quantities. And all persons that insist upon having proof goods, which not one in twenty understand, you must supply out of what goods are not so reduced, though at a higher price.'" (P. 267—270.)

Some of the adulterations of spirituous liquors are exceedingly pernicious.

"Another method of fining spirituous liquors, consists in adding to it, first, a solution of sub-acetate of lead, and then a solution of alum. This practice is highly dangerous, because part of the sulphate of lead produced, remains dissolved in the liquor, which it thus renders poisonous." (P. 284.) "The cordial called shrub frequently exhibits vestiges of copper." (P. 285.)

Gloucester Cheese has been found contaminated with red lead. The article used in colouring cheese is anotto. In one instance, the anotto, being inferior, had been coloured with vermilion; and the vermilion adulterated by a druggist, (who little thought that it would ever enter into the composition of cheese,) with red lead. The account of the whole transaction as given by Mr. Accum, is worth reading, but too long to be extracted.

Cayenne pepper, "is sometimes adulterated with red lead, to prevent its becoming bleached on exposure to light." (P. 305.) Pickles "are sometimes intentionally coloured by means of copper." (P. 306.) "Mrs. E. Raffald directs, 'to render pickles green, boil them with halfpence, or allow them to stand twenty-four hours in copper or brass pans.'" (P. 309.) "Vinegar is sometimes largely adulterated with sulphuric acid, to give it more acidity." (P. 311.) "Red sugar drops are usually coloured with the inferior kind of vermilion. This pigment is generally adulterated with red lead. Other kinds of sweetmeats are sometimes rendered poisonous by being coloured with preparations of copper." (P. 315, 316.) "The foreign conserves . . . . are frequently impregnated with copper." (P. 317.) "Quantities" of catsup "are daily to be met with, which on a chemical examination, are found to abound with copper." (P. 319.) "The quantity of copper which we have more than once detected in this sauce, used for seasoning, and which, on account of its cheapness, is much resorted to by people in the lower walks of life, has exceeded the proportion of lead to be met with in other articles employed in domestic economy." (P. 320.) "The leaves of the cherry-laurel, *prunus laurocerasus*, a poisonous plant," are used to flavour custards, *blanc-mange*, and other delacacies of the table. (P. 324.) An instance is given of the dangerous consequences of this practice. (P. 325, 326.) "The water distilled from cherry-laurel leaves is frequently mixed with brandy and other spirituous liquors." (P. 327.) Several samples of anchovy sauce "have been found contaminated with lead." (P. 328.) It is not unusual to employ, in preparing this sauce, "a certain quantity of Venetian red, added for

the purpose of colouring it, which, if genuine, is an innocent colouring substance. But instances have occurred of this pigment having been adulterated with orange lead, which is nothing else than a better kind of minimum or red oxid of lead." (P. 328, 329.) In lozenges, "the adulterating ingredient is usually pipe-clay, of which a liberal portion is substituted for sugar." (P. 330.) Dr. T. Lloyd says, "'I was informed,"' (at a *respectable* chemist's shop in the city) "'that there were two kinds of ginger lozenges kept for sale, the one at three-pence the once, and the other at six-pence; and that the article furnished to me by mistake was the cheaper commodity. The latter were distinguished by the epithet *verum*, they being composed of sugar and ginger only. But the former were manufactured partly of white Cornish clay, with a portion of sugar only, with ginger and Guinea pepper. I was likewise informed, that of Tolu lozenges, peppermint lozenges, and ginger pearls, and several other sorts or lozenges, two kinds were kept; that the *reduced* prices, as they were called, were manufactured for those very clever persons in their own conceit, who are fond of haggling, and insist on buying better bargains than other people, shutting their eyes to the defects of an article, so that they can enjoy the delight of getting it cheap: and, secondly, for those persons, who being but bad paymasters, yet as the manufacturer, for his own credit's sake, cannot charge more than the usual price of the article, he thinks himself therefore authorized to adulterate it in value, to make up for the risk he runs, and the long credit he must give." (P. 332, 333.)

Well—there is then some honesty left in the world. What a pleasure it is to have to deal with a *respectable* man. But we return to the practices of the *knaves*.

Olive oil "is sometimes contaminated with lead." (P. 334.) The dealers in this commodity assert that lead or pewter "prevents the oil from becoming rancid. And hence some retailers often suffer a pewter measure to remain immersed in the oil." (P. 336.) "The beverage called soda water is frequently contaminated both with copper and lead." (P. 351.) Mr. Johnston, of Greek Street, Soho, was the first who pointed out the danger to the public. "Many kinds of viands are frequently impregnated with copper, in consequence of the employment of cooking utensels made of that metal. By the use of such vessels in dressing food, we are daily liable to be poisoned." (P. 352.) "Mr. Thiery, who wrote a thesis on the noxious quality of cop-

per, observes that 'our food recieves its quantity of poison, in the kitchen by the use of copper pans and dishes. The brewer mingles poison in our beer, by boiling it in copper vessels. The sugar-baker employs copper pans. The pastry-cook bakes our tarts in copper moulds. The confectioner uses copper vessels. The oilman boils his pickles in copper or brass vessels, and verdigrise is plentifully formed by the action of the vinegar upon the metal.'" (P. 353, 354.) Moreover, "various kinds of food, used in domestic economy, are liable to become impregnated with lead." (P. 350.)

Mr. Accum, speaking on the subject of Beer, says,

"It will be noticed that some of the sophistications are comparatively harmless, whilst others are affected by substances deleterious to health." (P. 185.)

We think, however, that the candour of Mr. Accum leads him to make too much allowance for this consideration throughout. Surely, though many articles of food be not absolutely poisonous, a diet consisting of drugs and chemical compounds and articles never intended by nature to be eaten or drunk, articles for which, presented simple, the hungriest stomach would feel no appetite or inclination, cannot be wholesome. Brick and mortar are not poison; yet we cannot, like the dragon of Wantley, swallow a church, and pick our teeth with the steeple. Many can eat oysters, but few could manage the oyster-knife. Even the Welshman of King Arthur's court, fond as he was of toasted cheese, would inevitably have been choked by the mouse that ran down his throat to eat it, had he not "pulled him out by the tail."

We could give farther extracts; but must refer the reader to the work itself, which contains much interesting matter, besides what we have selected. THE MONEY THAT IS OFTEN LAID OUT IN THE PURCHASE OF COOKERY BOOKS, WHICH TEACH THE ART OF EXCITING DISEASE AND PAIN BY DUBIOUS COMBINATIONS AND CULINARY POISONS, MIGHT, WE THINK, BE MUCH BETTER EXPENDED UPON A BOOK LIKE THE PRESENT; EVERY PAGE OF WHICH GIVES WARNING OF SOME DANGER, OF WHICH WE OUGHT ALL TO BE AWARE.

A

Treatise on Adulterated Provisions.

By FREDRICK ACCUM.

THERE IS DEATH IN THE POT.

II. KINGS—CHAP. VI. VERSE XI.

(From Blackwood's Edinburgh Magazine, No. XXXV. Page 542.)

Mr. Accum, it appears, is one of those very good-natured friends, who is quite resolved not to allow us to be cheated and poisoned as our fathers were before us, and our children will be after us, without cackling to us of our danger, and opening our eyes to abysses of fraud and imposition, of the very existence of which we had until now the good fortune to be entirely ignorant. His book is a perfect death's head, a memento mori, the perusal of any single chapter of which is enough to throw any man into the blue devils for a fortnight. Mr. Accum puts us something in mind of an officious blockhead, who, instead of comforting his dying friend, is continually jogging him on the elbow with such cheering assurances as the following. "I am sorry there is no hope; my dear fellow, you must kick the bucket soon. Your liver is diseased, your lungs gone, your bowels as impenetrable as marble, your legs swelled like door-posts, your face as yellow as a guinea, and the doctor just now assured me you could not live a week."

Mr. Accum's work is evidently written in the same spirit of dark and melancholy anticipation, which pervades Dr. Robison's celebrated "Proofs of a Conspiracy, &c. against all the crowned heads of Europe." The conspiracy disclosed by Mr. Accum is certainly of a still more dreadful nature, and is even more widely ramified than that which excited so much horror in the worthy professor. It is a conspiracy of brewers, bakers, grocers, wine-merchants, confectioners, apothecaries, and cooks, against the lives of all and every one of his majesty's liege subjects. It is easy to see that Mr. Accum's nerves are considerably agitated, that—

"Sad forebodings shake him as he writes."

Not only at the festive board is he haunted by chimeras dire of danger—not only does he tremble over the tureen—and faint over the flesh-pot: but even in his chintz night-gown, and red morocco slippers, he is not secure. An imaginary sexton is continually jogging his elbow as he writes, a death's head and cross bones rise on

his library table; and at the visionary tomb-stone of the best end of his sofa he beholds a granite—

ON WHICH ARE INSCRIBED THE DREADFUL WORDS—

Hic Jacet,
FREDRICK ACCUM,
Operative Chemist,
OLD COMPTON STREET,
SOHO.

Since we read his book, our appetite has visibly decreased. At the Celtic club, yesterday, we dined almost entirely on roast beef; Mr. Oman's London-particular Madeira lost all its relish, and we turned pale in the act of eating a custard, when we recollected the dreadful punishment inflicted on custard-eaters, in page 326 of the present work. We beg to to assure our friends, therefore, that at the present moment they may invite us to dinner with the greatest impunity.—Our diet is at present quite similar to that of Parnel's hermit,

"Our food the fruits, our drink the crystal well;"

though we trust a few days will recover us from our panic, and enable us to resume our former habits of life. Those of our friends, therefore, who have any intention of pasturing us, had better not lose the present opportunity of doing so. So favourable a combination of circumstances must have been quite unhoped for on their part, and most probably will never occur again.* V. S.

Since, by the publication of Mr. Accum's book, an end has been for ever put to our former blessed state of ignorance, let us arm ourselves with philosophy, and boldly venture to look our danger in the face; or, as the poet beautifully expresses it, in language singularly applicable,

* To save some trouble, we may announce that we are already engaged to dinner, on the 23d, 27th, and 28th of this month, and to evening parties, on the 22d, 23d, 26th, 28th, and 29th, and 3d of March.

"Come, Christopher, and leave all meaner things,
To low ambition and the pride of kings;
Let us, since life can little else supply;
Than just to swallow poison and to die;
Expatiate free o'er all this dreadful field,
Try what the brewer, what the baker yield;
Explore the druggists' shop, the butchers' stall;
Expose their roguery, and—damn them all!" POPE.

Melancholy as the details are, there is something almost ludicrous, we think, in the very extent to which the deceptions are carried. So inextricably are we all immersed in this mighty labyrinth of fraud, that even the venders of poison themselves are forced, by a sort of retributive justice, to swallow it in their turn.—Thus the apothecary, who sells the poisonous ingredients to the brewer, chuckles over his roguery, and swallows his own drugs in his daily copious exhibitions of Brown stout. The brewer in his turn, is poisoned by the baker, the wine-merchant, and the grocer. And, whenever the baker's stomach fails him, he meets his *coup de grace* in the adulterated drugs of his friend the apothecary, whose health he has been gradually contributing to undermine, by feeding him every morning on chalk and alum, in the shape of hot rolls.

Our readers will now, we think, be able to form a general idea of the perils to which they are exposed by every meal.

Mr. Accum's details on the adulteration of wine are extremely ample, and so interesting, that we regret our limits prevent our making more copious extracts, and oblige us to refer our readers for farther information to the work itself.

Having thus laid open to our view the arcana of the cellar, Mr. Accum next treats us with an expose of the secrets of the brew-house. Verily, the wine-merchant and brewer are *par nobile fratrum;* and after the following disclosures, it will henceforth be a matter of the greatest indifference to us, whether we drink Perry or Champaigne, Hermitage or Brown stout. *Latet anguis in poculo,* there is disease and death in them all, and one is only preferable to the other, because it will poison us at about one-tenth of the expense.

"Malt liquors, and particularly porter, the favourite beverage of the inhabitants of London and of other large towns, is amongst those articles, in the manufacture of which the greatest frauds are frequently committed.

"The practice of adulterating beer appears to be of early date. To shew that they have augmented in our own days, we shall exhibit an abstract from documents laid lately before Parliament.

"Mr. Accum not only amply proves, that unwholesome ingredients are used by fraudulent brewers, and that very deleterious substances are also vended both to brewers and publicans for adulterating beer, but that the ingredients mixed up in the brewer's enchanting cauldron are placed above all competition, even with the potent charms of Macbeth's witches:

'Root of hemlock, digg'd i' the dark,
* * * *
* * * *
For a charm of pow'rful trouble,
Like a hell-broth boil and bubble;
Double, double, toil and trouble,
Fire burn, and cauldron bubble.'

Mr. Accum very properly gives us a list of those miscreants who have been convicted of adulterating their porter with poisonous ingredients, and want of room alone prevents us from damning them to everlasting fame, by inserting their names along with that of the Rev. Sennacherib Terrot, in the imperishable pages of this miscellany.

Mr. Accum gives us a long dissertation on counterfeit tea, and another on spurious coffee; but as these are impositions by which we are little affected, we shall not allow them to detain us. The leaves of the sloe-thorn are substituted for the former, and roasted horse beans for the latter. These frauds, it appears, are carried to a very great extent.

We must now draw our extracts to a close; but we can assure our readers, that we have not yet introduced them to one tythe of the poisonous articles in common use, detected by Mr. Accum. We shall give the titles of a few to satisfy the curious:—Poisonous confectionary, poisonous pickles, poisonous cayenne pepper, poisonous custards, poisonous anchovy sauce, poisonous lozenges, poisonous lemon acid, poisonous mushrooms, poisonous ketchup, and poisonous soda water! Read this, and wonder how you live!

While we thus suffer under accumulated miseries brought upon us by the unprincipled avarice and cupidity of others, it is surely incumbent on us not wantonly to increase the catalogue by any negligence or follies of our own. Will it be believed, that in the cookery book, which forms the prevailing oracle of the kitchens in this part of the island, there is an express injunction to "*boil greens with halfpence* in order to improve their *colour?*"—That our puddings are frequently seasoned with laurel leaves, and our sweatmeats almost uniformly prepared in copper vessels? Why are we thus compelled to swallow a supererogatorary quantity of poison which may so easily be avoided? And why are we constantly made to run the risk of our lives by participating in custards, trifles, and blancmanges, seasoned by a most deadly poison extracted from the *prunus lauro-cerasus?* Verily, while our present detestable system of cookery remains, we may exclaim with the sacred historian, that there is indeed "Death in the Pot."

A Treatise on Adulterations of Food,

AND CULINARY POISONS,

Exhibiting the Fraudulent Sophistications of Bread, Beer, Wine, Spirituous Liquors, &c. and Methods of detecting them.

By FREDRICK ACCUM.

(From the Edinburgh Review, No. LXV. Page 131.*)*

It is curious to see how vice varies its forms, and maintains its substance, in all conditions of society;—and how certainly those changes, or improvements as we call them, which diminish one class of offences, aggravate or give birth to another.—In rude and simple communities, most crimes take the shape of violence and outrage—in polished and refined ones, of Fraud. Men sin from their animal propensities in the first case, and from their intellectual depravation in the second. The one state of things is prolific of murders, batteries, rapines, and burnings—the other of forgeries, swindlings, defamations, and seductions. The sum of evil is probably pretty much the same in both—though probably greatest in the civilized and enlightened stages; the sharpening of the intellect, and the spread of knowledge, giving prodigious force and activity to all criminal propensities.

Among the offences which are peculiar to a refined and enlightened society, and owe their birth, indeed, to its science and refinement, are those skilful and dexterous adulterations of the manifold objects of its luxurious consumption, to which their value and variety, and the delicacy of their preparation, hold out so many temptations; while the very skill and knowledge which are requisite in their formation, furnish such facilities for their sophistication. The very industry and busy activity of such a society, exposes it more and more to such impostures;—and by the division of labour which takes place, and confines every man to his own separate task, brings him into a complete dependence on the industry of others for a supply of the most necessary articles.

The honesty of the dealer, and of the original manufacturer, is the only security to the public for the genuineness of the article in which he deals. The consumer can in general know nothing of their component parts; he must take them as he finds them; and, even if he is dissatisfied, he has in general no effectual means of redress.

It will be found, that as crimes of violence decrease with the progress of society, frauds are multiplied; and there springs up in every prosperous country a race of degenerate traders and manufacturers, whose business is to cheat and to deceive; who pervert their talents to the most dishonest purposes, prefering the illicit gains thus acquired to the fair profits of honorable dealing; and counter-working, by their sinister arts, the general improvement of society.

In almost every branch of manufacture, there are fraudulent dealers, who are instigated by the thirst of gain, to debase the articles which they vend to the public, and to exact a high price for what is comparatively cheap and worthless. After pointing out various deceptions of this nature, Mr. Accum, the ingenious author of the work before us, proceeds in his account of those frauds, in the following terms.

'Soap used in house-keeping is frequently adulterated with a considerable portion of fine white clay, brought from St. Stephen's in Cornwall. In the manufacture of printing paper, a large quantity of plaster of Paris is added to the paper stuff, to increase the weight of the manufactured article. The selvage of cloth is often dyed with a permanent colour, and artfully stitched to the edge of cloth dyed with a fugitive dye. The frauds committed in the tanning of skins, and in the manufacture of cutlery, and jewellery, exceed belief.' pp. 27-29.

What is infinitely worse, however, than any of those frauds, sophistications, we are informed, are carried on to an equal extent in all the essential articles of subsistence or comfort. So long as our dishonest dealers do not intermeddle with these things, their deceptions are comparatively harmless; the evil in all such cases amounting only to so much pecuniary damage. But when they begin to tamper with food, or with articles connected with the table, their frauds are most pernicious: in all cases the nutritive quality of the food is injured, by the artificial ingredients intermixed with it; and when these ingredients, as frequently happens, are of a poisonous quality, they endanger the health and even the life of all to whom they are vended. We cannot conceive any thing more diabolical than those contrivances; and we consider their authors in a far worse light than ordinary felons, who, being known, can be duly guarded against. But those fraudulent dealers conceal themselves under the fair show of a reputable traffic—they contrive in this manner to escape the infamy which justly belongs to them—and, under the disguise of wealth, credit, and character, to lurk in the bosom of society, wounding the hand that cherishes them, and scattering around them poison and death.

It is chiefly for the purpose of laying open the dishonest artifices of this class of dealers, that Mr. Accum has published the present very interesting and popular work; and he gives a most fearful view of the various and extensive frauds which are daily practised on the unsuspecting public.

'Among the number of substances used in domestic economy, which are now very generally found sophisticated, may be distinguished—tea, coffee, bread, beer, wine, spirituous liquors, salad oil, pepper, vinegar, mustard, cream, and other articles of subsistence.—Indeed, it would be difficult to mention a single article of food which is not to be met with in an adulterated state; and there are some substances which are scarcely ever to be procured genuine.—Some of these spurious compounds are comparatively harmless when used as food; and as, in these cases, merely substances of inferior value are substituted for more costly and genuine ingredients, the sophistication, though it may affect our purse, does not injure our health. Of this kind are the manufacture of factitious pepper, the adulterations of mustard, vinegar, cream, &c. Others, however, are highly deleterious; and to this class belong the adulterations of beer, wines, spirituous liquors, pickles, salad oil, and many others.' pp. 2—4.

There are, it appears, particular chemists who make it their sole employment to supply the unprincipled brewer of porter and ale with drugs, and other deleterious preparations; while others perform the same office to the wine and spirit merchant, as well as to the grocer and oilman—and these illicit pursuits have assumed all the order and method of a regular trade.

'The eager and insatiable thirst for gain' (Mr. Accum justly observes), 'which seems to be a leading characteristic of the times, calls into action every 'human faculty, and gives an irresistible impulse to the power of invention; 'and where lucre becomes the reigning principle, the possible sacrifice of a 'fellow-creature's life is a secondary consideration.'

Mr. Accum having exhibited this general view of his subject, proceeds to enter into an examination of the articles most commonly counterfeited, and to explain the nature of the ingredients used in sophisticating them. He commences with a dissertation on the qualities of good water, in which he briefly points out the dangerous sophistications to which it is liable, from the administration of foreign ingredients.

But in the case of water, the adulteration is purely accidental, which cannot be said of the other articles specified by Mr. Accum. In the making of Bread, more especially in London, various ingredients are occasionally mingled with the dough. To suit the caprice of his customers, the baker is obliged to have his bread light and porous, and of a pure white. It is impossible to produce this sort of bread from flour alone, unless it be of the finest quality. The best flour, however, being mostly used by the biscuit-bakers and pastry-cooks, it is only from the inferior

sorts that bread is made; and it becomes necessary, in order to have it of that light and porous quality, and of a fine white, to mix alum with the dough. Without this ingredient, the flour used by the London bakers would not yield so white a bread as that sold in the metropolis.

Wine appears to be a subject for the most extensive and pernicious frauds.

'All persons (Mr. Accum observes) 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 their colour; that Brazil wood, or the husks of elder-berries and bilberries, which are imported from Germany, under the fallacious name of *berry-dye*, are employed to impart a deep rich purple tint to red port of a pale colour; that gypsum is used to render cloudy white wines transparent; that an additional astringency is imparted to immature red wines by means of oak-wood and sawdust, 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 the metropolis by the name of *genuine old Port*.'

Other expedients are resorted to, in order to give flavour to insipid wines. For this purpose bitter almonds are occasionally employed; factitious port wine is also flavoured with a tincture drawn from the seeds of raisins; and other ingredients are frequently used, such as sweet brier, orris root, clary, cherry-laurel water, and elder flowers.

In London, the sophistication of wine is carried to an enormous extent, as well as the art of manufacturing spurious wine, which has become a regular trade, in which a large capital is invested; and it is well known that many thousand pipes of spoiled cider are annually sent to the metropolis for the purpose of being converted into an imitation of port-wine.

Innumerable are the tricks practised to deceive the unwary, by giving to weak, thin, and spoiled wines, all the characteristic marks of age, and also of flavour and strength. In carrying on these illicit occupations, the division of labour has been completely established; each has his own task assigned him in the confederate work of iniquity; and thus they acquire dexterity for the execution of their mischievous purposes. To one class is allotted the task of *crusting*, which consists in lining the interior surface of empty wine bottles with a red crust. This is accomplished by suffering a saturated hot solution of super-tartrate of potash, coloured red with a decoction of Brazil wood to crystallize within them. A similar operation is frequently performed on the wooden cask which is to hold the wine, and which, in the same manner as the bottle, is artificially stained with a red crust; and on some occasions, the lower ex-

tremities of the corks in wine bottles are also stained red, in order to give them the appearance of having been long in contact with the wine. It is the business of a particular class of wine-coopers, by means of an astringent extract mixed with home-made and foreign wines, to produce 'genuine old port,' or to give an artificial flavour and colour to weak wine; while the mellowing and restoring of spoiled white wines is the occupation of another class called refiners of wine. Other deceptions are practised by fraudulent dealers, which are still more culpable. The most dangerous of these is where wine is adulterated by an admixture of lead.

Mr. Accum justly observes, that 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.'

Spirituous liquors, which in this country form one of the chief articles of consumption, are subjects of equally extensive fraud with wine. The deceptions which are practised by the dealers in this article, are chiefly confined to fraudulent imitations of the peculiar flavour of different sorts of spirits; and as this flavour constitutes, along with the strength, the value of the spirit, the profit of the dealer consists in imitating this quality at a cheaper rate than it is produced in the genuine spirit. The flavour of French brandy is imitated, by distilling British molasses spirit over wine lees; previous to which, however, the spirit is deprived of its peculiar disagreeable flavour, by rectification over fresh-burnt charcoal and quicklime. This operation is performed by those who are called brewers' druggists, and forms the article in the *prices-current* called *Spirit Flavour*. Wine lees are imported into this country for the purpose, and they pay the same duty as foreign wines. Another method of imitating the flavour of brandy, which is adopted by brandy merchants, is by means of a spirit obtained from raisin wine, after it has begun to become somewhat sour. 'Oak sawdust,' (Mr. Accum observes), 'and a spirituous tincture of raisin stones, are likewise used to impart to new brandy and rum a *ripe taste*, resembling brandy or rum long kept in oaken casks, and a somewhat oily consistence, so as to form a durable froth at its surface, when strongly agitated in a vial. The colouring substances are burnt sugar, or molasses; the latter gives to imitative brandy a luscious taste, and fulness in the mouth.' Gin, which is sold in small

quantities to those who judge of the strength by the taste, is made up for sale by fraudulent dealers with water and sugar; and this admixture rendering the liquor turbid, several expedients are resorted to, in order to clarify it; some of which are harmless, while others are criminal. A mixture of alum with subcarbonate of potash, is sometimes employed for this purpose; but more frequently, in place of this, a solution of subacetate of lead, and then a solution of alum,—a practice reprobated by Mr. Accum as highly dangerous, owing to the admixture of the lead with the spirit, which thereby becomes poisonous. After this operation, it is usual to give a false appearance of strength to the spirit by mixing with it grains of paradise, guinea pepper, capsicum, and other acrid and aromatic substances.

In the manufacture of malt liquors, a wide field is opened for the operations of fraud. The immense quantity of the article consumed, presents an irresistible temptation to the unprincipled dealer; while the vegetable substances with which beer is adulterated, are in all cases difficult to be detected, and are frequently beyond the reach of chemical analysis. There is, accordingly, no article which is the subject of such varied and extensive frauds. These are committed in the first instance by the brewer, during the process of manufacture, and afterwards by the dealer, who deteriorates, by fraudulent intermixtures, the liquor which he sells to the consumer. 'The intoxicating qualities of porter (he continues) are to be ascribed to the various drugs intermixed with it;' and, as some sorts of porter are more heady than others, the difference arises, according to this author, 'from the greater or less quantity of stupifying ingredients' contained in it. These consist of various substances, some of which are highly deleterious. Thus, the extract disguised under the name of *black extract*, and ostensibly destined for the use of tanners and dyers, is obtained by boiling the berries of the *cocculus indicus* in water, and converting, by a subsequent evaporation, this decoction into a stiff black tenacious mass, possessing in a high degree the narcotic and intoxicating quality of the poisonous berry from which it is prepared. Quassia is another substance employed in place of hops, to give the beer a bitter taste; and the shavings of this wood are sold in a half torrified and ground state, in order to prevent its being recognised.

Not only is the use of all these deleterious substances strictly prohibited to the brewer under severe penalties, but all drug-

gists or grocers convicted of supplying him with any of them, or who have them in their possession, are liable to severe penalties; and Mr. Accum gives a list of twenty-nine convictions for this offence, from the year 1812 to 1819. From the year 1818 to 1819, the number of brewers prosecuted and convicted of using illegal ingredients in their breweries, amounts to thirty-four. Numerous seizures have also been made during the same period at various breweries, and in the warehouses of brewers'-druggists, of illegal ingredients, to be used in the brewing of beer, some of them highly deleterious.

Malt liquors, after they are delivered by the brewer to the retail-dealer, are still destined to undergo various mutations before they reach the consumer. It is a common practice with the retailers of beer, though it be contrary to law, to mix table-beer with strong beer; and, to disguise this fraud, recourse is had to various expedients. It is a well known property of genuine beer, that when poured from one vessel into another, it bears a strong white froth, without which professed judges would not pronounce the liquor good. This property is lost, however, when table-beer is mixed with strong beer; and to restore it, a mixture of what is called *beer-heading* is added, composed of common green vitriol, alum, and salt. To give a pungent taste to weak insipid beer, capsicum and grains of paradise, two highly acrid substances, are employed; and, of late, a concentrated tincture of these articles has appeared for sale in the prices-current of brewers'-druggists. To bring beer forward, as it is technically called, or to make it hard, a portion of sulphuric acid is mixed with it, which, in an instant, produces an imitation of the age of eighteen months; and stale, half-spoiled, or sour beer, is converted into mild beer, by the simple admixture of an alkali or an alkaline earth; oyster-shell powder, and subcarbonate of potash, or soda, being usually employed for that purpose. In order to show that these deceptions are not imaginary, Mr. Accum refers to the frequent convictions of brewers for those fraudulent practices, and to the seizures which have been made at different breweries of illegal ingredients—a list of which, and of the proprietors of the breweries where they were seized, he has extracted from the Minutes of the Committee of the House of Commons, appointed to Inquire into the Price and Quality of Beer. It may be observed, that while some of the sophistications of beer appear to be perfectly harmless, other substances are frequently employed for this purpose which are highly deleterious, and which must gradually undermine the health of those by whom they are used.

Many other of the most ordinary articles of consumption are mentioned by our author as being the object of the most disgusting and pernicious frauds. Tea, it is well known, from the numerous convictions which have lately taken place, has been counterfeited to an enormous extent; and copper, in one form or another, is the chief ingredient made use of for effecting the imitation.

The practice of adulterating coffee, has also been carried on for a long time, and to a considerable extent, while black and white pepper, Cayenne pepper, mustard, pickles of all sorts, have been all of them debased by an admixture of baser, and, in many cases, poisonous ingredients. Ground pepper is frequently sophisticated by an admixture from the sweepings of the pepper warehouses. These sweepings are purchased in the market under the initials P. D., signifying pepper dust. 'An inferior 'sort of this vile refuse (Mr. Accum observes), or the sweepings 'of P. D., is distinguished among venders by the abbreviation 'of D. P. D., denoting dust, or dirt of pepper dust.'

Of those various frauds so ably exposed in Mr. Accum's work, and which are so much the more dangerous, as they are committed under the disguise of an honourable trade, it is impossible to speak in terms of too strong reprobation; and in the first impulse of our indignation, we were inclined to avenge such iniquitous practices by some signal punishment. We naturally reflect, that such offences, in whatever light they are viewed, are of a far deeper dye than many of those for which our sanguinary code awards the penalty of death—and we wonder that the punishment hitherto inflicted, has been limited to a fine. If we turn our view, however, from the moral turpitude of the act, to a calm consideration of that important question, namely,—What is the most effectual method of protecting the community from those frauds?—we will then see strong reasons for preferring the lighter punishment. We do not find from experience, that offences are prevented by severe punishments. On the contrary, the crime of forgery, under the most unrelenting execution of the severe law against it, has grown more frequent. As those, therefore, by whom the offence of adulterating articles of provision is committed, are generally creditable and wealthy individuals, the infliction of a heavy fine, accompanied by public disgrace, seems a very suitable punishment: and if it be duly and reasonably applied, there is little doubt that it will be found effectual to check, and finally to root out, those disgraceful frauds.

POISONING OF FOOD.

A Treatise on Adulterations of Food,

AND CULINARY POISONS;

Exhibiting the Fraudulent Sophistications of Bread, Beer, Wine, Spirituous Liquors, Tea, Coffee, Cheese, Pepper, Mustard, &c. &c. And methods of detecting them.

BY FREDRICK ACCUM.

(*From the Literary Gazette, No. CLVI.* 1820.)

One has laughed at the whimsical description of the cheats in Humphrey Clinker, but it is really impossible to laugh at Mr. Accum's exposition. It is too serious for a joke to see that in almost every thing which we eat or drink, we are condemned to swallow swindling, if not poison—that all the items of metropolitan, and many of country consumption, are deteriorated, deprived of nutritious properties, or rendered obnoxious to humanity by the vile arts and merciless sophistications of their sellers. So general seems the corruption, and so fatal the tendency of most of the corrupting materials, that we can no longer wonder at the prevalence of painful disorders, and the briefness of existence (on an average) in spite of the great increase of medical knowledge, and the amazing improvement in the healing science, which distinguish our era. No skill can prevent the effects of daily poisoning; and no man can prolong his life beyond a short standard, where every meal ought to have its counteracting medicine.

Mr. Accum acts the part of Dionysius with us; only the horse-hair by which he suspends the sword over our heads allows the point gradually to enter the flesh, and we do not escape, like Damocles, with the simple fright: yet it is but justice to acknowledge, that in almost every case he furnishes us with tests whereby we can assertain the nature of our danger; and no man could do more towards enabling us to mitigate or escape from it.

Advising our readers to abstain from perusing the annexed synopsis till after they have dined, that they may have one more meal in comfort ere they die, we proceed to the various heads under which the author ranges his dread array.

Devoted to disease by baker, brewer, grocer, &c. the physician is called to our assis-

tance; but here again the pernicious system of fraud, as it has given the blow, steps in to defeat the remedy.

It is so horribly pleasant to reflect how we are in this way be-swindled, be-trayed, be-drugged, and be-devilled, that we are almost angry with Mr. Accum for the great service he has done the community by opening our eyes, at the risk of shutting our mouths for ever.

His account of water is so fearful, that we see there is no wisdom in the well; and if we then fly to wine, we find, from his analysis, that there is no truth in that liquid: bread turns out to be a crutch to help us onward to the grave, instead of the staff of life; in porter there is no support, in cordials no consolation; in almost every thing poison, and in scarcely any medicine, cure.

The work contains a great many excellent observations on the various sorts of water, and the modes of conveying and preserving them for use: it appears generally that leaden pipes and cisterns, and copper vessels are highly dangerous.

Good heavens! we think we hear it exclaimed, is there no end to these infamous doings? does nothing pure or unpoisoned come to our tables, except butcher's meat, which has been rendered far less nutritive than formerly, by new methods of feeding? Why, we must answer, hardly any thing: for our author proceeds to shew that *cheese* (Gloucester he mentions) has been contaminated with red lead, a deadly poison mixed with the colouring anotto, when that article was scarce: that *pepper* is adulterated with factitious pepper-corns "made up of oil-cakes (the residue of lint-seed, from which the oil has been pressed), common clay, and a portion of Cayenne pepper, formed in a mass, and granulated by being first pressed through a sieve, and then rolled in a cask;" and further, that "ground pepper is very often sophisticated by adding to a portion of genuine pepper, a quantity of pepper dust, or the sweepings from the pepper warehouses, mixed with a little Cayenne pepper. The sweepings are known, and purchased in the market, under the name of P.D. signifying pepper dust. An inferior sort of this vile refuse, or the sweepings of P.D. is distinguished among vendors by the abbreviation D.P.D. denoting, dust (dirt) of pepper dust."

As we read on, we learn the method of manufacturing adulterated vinegar, adulterated cream, adulterated lozenges, adulterated mustard, adulterated lemon acid, poisonous Cayenne, poisonous pickles, poisonous confectionary, poi-

sonous catsup, poisonous custards, poisonous anchovy sauce, poisonous olive oil, poisonous soda water; and, if not done to our hands, of rendering poisonous all sorts of food by the use of copper and leaden vessels. Suffice it to record, that our pickles are made green by copper; our vinegar rendered sharp by sulphuric acid; our cream composed of rice powder or arrow root in bad milk; our comfits mixed of sugar, starch, and clay, and coloured with preparations of copper and lead; our catsup often formed of the dregs of distilled vinegar with a decoction of the outer green husk of the walnut, and seasoned with all-spice, cayenne, pimento, onions, and common salt—or if founded on mushrooms, done with those in a putrefactive state remaining unsold at market; our mustard a compound of mustard, wheaten flour, cayenne, bay salt, raddish seed, turmeric, and pease flour; and our citric acid, our lemonade, and our punch, to refresh or to exhilerate, usually cheap tartareous acid modified for the occasion.

Against all these, and many other impositions, Mr. Accum furnishes us with easy and certain tests: his work, besides, contains many curious documents and useful recipes; and it is replete with intelligence, and often guides to the right while it exposes the wrong.

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By FREDRICK ACCUM.

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