We only deliver in this Place, the first Elements of each of these Operations, which will be farther illustrated in the Sequel, when we treat more particularly of these Subjects.

C H A P. XIII.

Of what is procured by Distillation.

By Distillation are procured Spirit, Essence, simple Waters and Phlegm.

Spirits are very difficult to be defined. I consider them as the most subtil and volatile Parts of a Body.

All Bodies without Exception have Spirits more or less.

These Parts are an ignited Substance, and consequently by their own Nature disposed to a violent Motion.

These volatile Particles are more or less disposed to separate themselves, as the Bodies are more or less porous, or abound with a greater or lesser Quantity of Oil.

By the Term Essence, we understand the oleaginous Parts of a Body. An essential Oil
Oil is found in all Bodies, being one of their constituent Principles. I have observed in all my Distillations, Spirit of Wine excepted, a soft unctuous Substance floating on the Phlegm; and this Substance is Oil, which we call Essence; and this is what we endeavour to extract.

Simple Waters are those distilled from Plants, Flowers, &c. without the Help of Water, Brandy, or Spirit of Wine. These Waters are commonly odoriferous, containing the Odour of the Body from whence it is extracted, and even exceeds in Smell the Body itself.

Phlegm is the aqueous Particles of Bodies; but whether an active or passive Principle, we shall leave to the Decision of Chemists.

It is of the last Importance to a Distiller to be well acquainted with its Nature; many mistaking for Phlegm several white and clouded Drops, which first fall into the Receiver, when the Still begins to work. These, however, are often the most spirituous Particles of the Matter in the Alembic, and consequently ought to be preserved. What has given occasion to this Mistake, is some Humidity remaining in the Head, &c. of the Alembic. And had it been thoroughly wiped, the first Drops would have been.
been equally bright with any during the whole Operation.

The following Remark deserves Attention. In Bodies that have been digested the Spirits ascend first; whereas in Charges not digested, the Phlegm ascends before the Spirits. The Reason of this is very plain and natural.

In Substances previously digested, the Action of the Fire no sooner causes the Matter in the Alembic to boil, than the Spirits, being the most volatile Parts, detach themselves, and ascend into the Head of the Alembic. But when the Matter to be distilled has not undergone a proper Digestion, the Spirits being intangled in the Phlegm, are less disposed to ascend, till the Phlegm itself separates, and gives them room to fly upward. The Phlegm being aqueous rises first: This is more particularly observable in Spices. I am, however, inclined to believe, that were the Operation performed in an Alembic, whose Head was at a great Distance from the Surface of the Charge, they would not ascend high enough to come over the Helm, but fall back again by their own Gravity, and by that means leave the Spirits at Liberty to ascend. But in the common Refrigeratory Alembic this always happens.
If this Observation be not readily admitted, I appeal to Experience, which I desire may be the Test of everything I shall advance.

Another Observation, which has verified the above Assertion by innumerable Instances, is, that in an extraordinary Run of Business, when I had not time sufficient to digest the Substances, I used to bruise them in a Mortar; but notwithstanding the Trituration, the Phlegm first came over, and afterwards the Spirits. But I desire to be understood, that I speak here only of the volatile Parts of the Plants not drawn with vinous Spirits, but contained in a simple Water.

Another Remark I must add, and which I hope will be acceptable to the Curious, as it has not yet been made public, though doubtless the Observation has often occurred to others; it is this: That in mixed Charges, consisting of Flowers, Fruits, and aromatic Plants, put into the Alembic without a previous Digestion, the Spirits of the Flowers ascend first; and notwithstanding the Mixture, they contracted nothing of the Smell or Taste of the Fruits and Plants. Next after the Spirits of the Flowers, those of the Fruits ascend, not in the least impregnated with the Smell or Taste of either of the Flowers.
Flowers or Plants. And in the last Place the Spirits of the Plants distil no less neat than the former. Should this appear strange to any one, Experience will convince him of the Truth.

Another Observation I have made on aromatic Herbs, is, that whether they are, or are not digested; whether the Spirits or Phlegm ascend first; the Spirits contain very little of the Taste and Smell of the Plants from whence they were extracted; and I have always been obliged to put to these Spirits a greater or lesser Quantity of the Phlegm, in order to give the Spirits I had drawn the Taste of an aromatic Odour of the Plants; the Phlegm containing the greatest Quantity of both.

This Observation I insert, as of great Use to those who practise Distillation.

As the Term Digestion often occurs in this Essay, I cannot avoid pointing out its Advantages, and even shew the Necessity of using it in several Circumstances.

Substances are said to be in Digestion, when they are infused in a Menstruum, over a very slow Fire. This Preparation is often necessary in Distillation; for it tends to open the Bodies, and thereby free the Spirits.
of Distillation.

Rits from their Confinements, whereby they are the better enabled to ascend.

Cold Digestions are the best; those made by Fire, or in hot Materials, diminish the Quality of the Goods, as some Part, as the most volatile, will be lost.

In order to procure Essences, the Bodies must be prepared by Digestion. It is even of absolute Necessity for extracting the Spirits and Essences of Spices.

C H A P. XIV.

Of the proper Season for Distilling.

FLOWERS of all Kinds must be distilled in their proper Seasons. To begin with the Violet. Its Colour and Smell can only be extracted when it is in its greatest Vigour, which is not at its first Appearance, nor when it begins to decay. April is the Month in which it is in its greatest Perfection; the Season being never so forward in March, as to give the Violet its whole Fragrancy.

The same must be observed of all other Flowers. And let them be gathered at the hottest Time of the Day; the Odour and Fra-
Fragrancy of Flowers being then in their greatest Perfection.

The same Observation holds good, with regard to Fruits; to which must be added; that they are the finest, and of the most beautiful Colour, especially those from whence Tinctures are drawn; they must be free from all Defects, as the Goods would by that Means be greatly detrimented.

Berries and Aromatics may be distilled at any Season, all that is necessary being a good Choice. But in this Distillers are sometimes mistaken, as may easily happen without a very accurate Knowledge. We shall therefore, in the Sequel, lay down more particular Directions for making a proper Choice of Materials.

CHAP. XV.
Of the Filtration of Liquors.

Filtration consists in passing Liquors thro' some porous Substance, in order to free them from those Particles which obscure their Brightness.

Nothing is finer than a Liquor newly distilled; but the Syrup and colouring Particles
Siccles render it thick and opaque; in order, therefore, to restore their Brightness they are filtrated, which is done by passing them through Sand, Paper, Cloth, &c.

All the Attention of the Distiller cannot in ordinary Operations always prevent some aqueous Particles from rising with the Spirits, either in the Beginning of the Process, in those Compositions where they ascend first, or at the Conclusion when they rise last. As this is almost unavoidable, so it is also sometimes necessary.

In distilling Flowers, or aromatic Plants, fresh gathered, the Phlegm rises first; and this Part cannot be taken out of the Receiver without depriving the Spirits of a considerable Part of their Fragrancy.

In distilling Spices, their Odour being more entangled, will remain in the Alembic till Part of the Phlegm is drawn off. But when, instead of these Substances, their Quintessences are used, the Necessity ceases. But the Phlegm commonly causing a Cloudiness in the Liquor, it may be rendered tolerably fine, by pouring it gently off by Inclination, without the Trouble of Filtration, the aqueous Particles, by their Gravity, falling to the Bottom. But to render it entirely bright and fine, put some Cotton
ton in a Funnel, and pour the Liquor thro' it, by which means the aqueous Particles will be retained in the Cotton. You must however remember to cover the Top of the Funnel, to prevent the most volatile Parts of the Spirits from evaporating.

C H A P. XVI.

Of the Distillation of Malt Spirits.

THE Wash, or Liquor being prepared by Brewing and Fermentation, as directed in the first and second Chapters of this Treatise, the Still is to be charged with it, and worked off with a pretty brisk Fire. But it should be observed, that the only Apparatus used in this Process, is the Alembic with a Refrigeratory, as represented in Fig. 1.

The Wash being of a mucilaginous Nature, a particular Management is necessary to prevent its burning, and cause it to work kindly in the Still: If it should happen to be burnt in the Operation, the Spirit will have a most disagreeable Flavour, which can hardly ever be removed; and therefore to prevent this ill Effect, the Wash should be made dilute or thin, the Fire well regulated, and the whole kept in a continual Agitation during the whole Process. The most judicious
cious Distillers always take care to have their Wash sufficiently diluted, and const-
tantly find their Spirit the purer for it. With regard to the Fire, it may be easily kept regular by a constant Attendance, and observing never to stir it hastily, or throw on fresh Fuel; and the stirring of the Liquor in the Still is to be effected by Means of a Paddle, or Bar kept in the Liquor till it just begins to boil, which is the Time for luting on the Head; and after which there is no great Danger, but from the improper Management of the Fire: This is the common Way; but it is no easy Matter to hit the exact Time, and the doing it either too late, or too soon, is attended with great Inconvenience, so that several have discovered other Methods; some put more solid Bodies into the Still with the Wash; others place some proper Matter at the Bottom and Sides of the Still, which are the Places where the Fire acts with the greatest Force.

The Use of the Paddle would, however, answer better than either of these Methods, could it be continued during the whole Time the Still is working; and this may be done by the following Method: Let a short Tube of Iron or Copper be soldered in the Center of the Still-head, and let a cross Bar be placed below in the same Head, with a Hole in the Middle, corresponding to that
at the Top; through both these let an iron Pipe be carried down in the Still, and let an iron Rod be passed through this with wooden Sweeps at its End; this Rod may be continually worked by a Winch at the Stillhead, and the Sweeps will continually keep the Bottom and Sides scraped clean, the Interstices of the Tube being all the time well crammed with Tow to prevent any Evaporation of the Spirit.

The same Effect may, in a great Measure, be produced by a less laborious Method, namely, by placing a Parcel of cylindrical Sticks lengthways, so as to cover the whole Bottom of the Still, or by throwing in a loose Parcel of Faggot Sticks at a Venture; for the Action of the Fire below moving the Liquor, at the same time gives Motion to the Sticks, making them act continually like a Parcel of Stirrers upon the Bottom and Sides of the Still, which might, if necessary, be furnished with Buttons and Loops, to prevent them from starting. Some also use a Parcel of fine Hay laid upon the loose Sticks; and secured down by two cross Poles, laid from Side to Side, and in the same Manner fastened down with Loops. Care is to be taken in this Case not to press the Hay against the Sides of the Still; for that would scorch nearly as soon as the Wash itself; but the Sticks never will; These are simple but
of Distillation.

but effectual Contrivances, and in point of Elegance, they may be improved at Pleasure.

There is another Inconvenience attending the distilling of Malt Spirit, which is, when all the Bottoms, or gross mealy Fœculence is put into the Still along with the Liquor, the thinner Part of the Wash going off in Form of Spirit; the mealy Mass grows by Degrees more and more stiff, so as to scorch towards the latter Part of the Operation. The best Method of remedying this is to have a Pipe with a Stop-cock, leading from the upper Part of the Worm-tub into the Still; so that upon a half, or a quarter Turn, it may continually supply a little Stream of hot Water, in the same Proportion as the Spirit runs off, by which Means the Danger of scorching is avoided, and the Operation, at the same time, not in the least retarded.

In Holland, the Malt Distillers work all their Wash thick, with the whole Body of Meal among it; yet they are so careful in keeping their Stills clean, and so regular and nice in the Management of their Fires, that though they use no Artifice at all on this Head, only to charge the Still while it is hot and moist, they very rarely have the Misfortune to scorch, except now and then in
in the Depth of Winter. When such an Accident has once happened in a Still, they are extremely careful to scrape, scrub and scour off the Remains of the burnt Matter, otherwise they find the same Accident very liable to happen again in the same Place. But beyond all the other Methods in Use on this Occasion, would be the working the Stills not by a dry Heat, but in a Balneum Maris, which might possibly be so contrived by the Basin being large, and capable of working a great many Stills at once, as to be extremely worth the Proprietor's while in all respects.

Another Requisite to be observed is, that the Water in the Worm-tub be kept cool; this may be affected, by placing in the middle of the Tub a wooden Pipe or Gutter, about three Inches square within, reaching from the Top almost to the Bottom; by this Contrivance cold Water may, as often as necessary, be conveyed to the Bottom of the Worm-tub, and the hot Water at the Top forced either over the Sides of the Tub, or, which is better, through a leaden Pipe of moderate Size, called a Waste-pipe, soldered into the Top of the Tub, and extended to the Gutter formed to carry away the Water.
CHAP. XVII.

Of the Distillation of Molasses Spirits:

THE Spirit distilled from Molasses or Treacle, is very clean or pure. It is made from common Treacle dissolved in Water, and fermented in the same Manner as the Wash for the common Malt Spirit.

But if some particular Art is not used in Distilling this Spirit, it will not prove so vinous as Malt Spirit, but more flat and less pungent and acid, though otherwise much cleaner tasted, as its essential Oil is of a less offensive Flavour. Therefore, if good fresh Wine-lees, abounding in Tartar, be added and duly fermented with the Molasses, the Spirit will acquire a much greater Vinosity and Briskness, and approach much nearer to the Nature of foreign Spirits.

Where the Molasses Spirit is brought to the common Proof Strength, if it be found not to have a sufficient Vinosity, it will be very proper to add some good dulcified Spirit of Nitre; and if the Spirit be clean worked, it may, by this Addition only, be made to pass on ordinary Judges for French Brandy.

Great
Great Quantities of this Spirit are used in adulterating foreign Brandy, Rum, and Ar-rac. Much of it is also used alone in making Cherry-Brandy, and other Drams by Infusion; in all which many, and perhaps with Justice, prefer it to foreign Brandies.

Molosse, like other Spirits, is entirely colourless when first extracted; but Distillers always give it, as nearly as possible, the Colour of foreign Spirits; the Methods of performing which we shall explain in a subsequent Chapter.

C H A P. XVIII.

Of the Nature of Brandies, and Method of distilling them in France.

The general Method of distilling Brandies in France need not be formally described, as it differs in nothing from that commonly practised here in working from Wash or Molosse; nor are they in the least more cleanly, or exact in the Operation.

They only observe more particularly to throw a little of the natural Lee into the still, along with the Wine, as finding this gives
gives their Spirit the Flavour, for which it is generally admired abroad.

But though Brandy is extracted from Wine, Experience tells us, that there is a great Difference in Grapes from which the Wine is made. Every Soil, every Climate, every kind of Grapes varies with regard to the Quantity and Quality of Spirits extracted from them. There are some Grapes which are only fit for eating; others for drying; as those of Damascus, Corinth, Provence, and Avignon; but not fit to make Wine.

Some Wines very proper for Distillation; others much less so. The Wines of Languedoc and Provence afford a great deal of Brandy by Distillation, when the Operation is made in their full Strength; The Orleans Wines, and those of Blois afford yet more; but the best are those of the Territories of Cogniac and of Andaye, which are however in the Number of those the least drank in France. Whereas those of Burgundy and of Champaign, though of a very fine Flavour, are improper, because they yield but very little in Distillation.

It must also be farther observed, that all the Wines for Distillation, as those of Spain, the Canaries, of Alicant, of Cyprus, of St. Peres, of Toquet, of Grave, of Hungary,
and others of the same kind, yield very little Brandy by Distillation; and consequently would cost the Distiller considerably more than he could sell it for. What is drawn from them is indeed very good, always retaining the saccharine Quality, and rich Flavour of the Wine from whence it is drawn; but as it grows old, this Flavour often grows aromatic, and is not agreeable to all Palates.

Hence we see, that Brandies always differ, according as they are extracted from different Species of Grapes. Nor would there be so great a Similarity as there is between the different kinds of French Brandies, were the strongest Wines used for this Purpose: But this is rarely the Case, the weakest and lowest-flavoured Wines only are distilled for their Spirit, or such as prove absolutely unfit for any other Use.

A large Quantity of Brandies is distilled in France during the Time of the Vintage; for all those poor Grapes that prove unfit for Wine, are usually first gathered, pressed, their Juice fermented, and directly distilled. This rids their Hands of their poor Wines at once, and leaves their Casks empty for the Reception of better. It is a general Rule with them not to distil any Wine, that will fetch any Price as Wine; for, in this State,
of Distillation.

State, the Profits upon them are vastly greater than when reduced to Brandies. This large Stock of small Wines, with which they are almost over-run in France, sufficiently accounts for their making such vast Quantities of Brandy in France, more than other Countries, which lie in warmer Climates, and are much better adapted to the Production of Grapes.

Nor is this the only Fund of their Brandies; for all the Wine that turns eager, is also condemned to the Still; and, in short, all that they can neither export, nor consume at home, which amounts to a large Quantity; since much of the Wine, laid in for their Family Provision, is so poor, as not to keep during the Time in spending.

Hence many of our English Spirits, with proper Management, are convertible into Brandies, that shall hardly be distinguished from the foreign in many Respects, provided this Operation be neatly performed. And, in particular, how far a Cyder Spirit, and a Crab Spirit, may, even from the first Extraction, be made to resemble the fine and thin Brandies of France, we would recommend to those Distillers, whose Skill and Curiosity prompts them to Undertakings condemned by those who only work mechanically, and scorn
A Complete System

scorn to deviate from the beaten Tract, tho' they have the fairest Prospect of acquiring Profit to themselves, and a lasting Emolument to their Country.

C H A P. XIX.

Of the Distillation of Rum.

Rum differs from what we simply call Sugar Spirit, as it contains more of the natural Flavour, or essential Oil of the Sugar Cane; a great deal of raw Juice, and even Parts of the Cane itself being often fermented in the Liquor, or Solution, of which the Rum is prepared.

Hence we see from whence Rum derives its Flavour; namely, from the Cane itself. Some, indeed, are of Opinion, that the unctuous or oily Flavour of the Rum proceeds from the large Quantity of Fat used in boiling the Sugar. This Fat, indeed, if coarse, will give a stinking Flavour to the Spirit in our Distillations of the Sugar Liquor, or Wash, from our refining Sugar-houses; but this is nothing like the Flavour of the Rum; which, as we have already observed, is the Effect of the natural Flavour of the Cane.

Great
Great Quantities of Rum are made at Jamaica, Barbadoes, Antigua, and other Sugar Islands: The Method of making it is this:

When a sufficient Stock of the Materials is got together, they add Water to them, and ferment them in the common Method, though the Fermentation is always carried on very slowly at first; because at the Beginning of the Season for making Rum in the Islands, they want Yeast, or some other Ferment to make it work; but after this, they, by Degrees, procure a sufficient Quantity of the Ferment, which rises up as a Head to the Liquor in the Operation; and thus they are able afterwards to ferment, and make their Rum with a great deal of Expedition, and in very large Quantities.

When the Wash is fully fermented, or to a due Degree of Acidity, the Distillation is carried on in the common Way, and the Spirit is made up Proof; though sometimes it is reduced to a much greater Degree of Strength, nearly approaching to that of Alcohol, or Spirit of Wine; and it is then called double distilled Rum.

It would be easy to rectify the Spirit, and bring it to a much greater Degree of Purity than.
than we usually find it to be of; for it brings over in the Distillation a large Quantity of the Oil; and this is often so disagreeable, that the Rum must be suffered to lie by a long time to mellow before it can be used; whereas, if well rectified, its Flavour would be much less, and consequently much more agreeable to the Palate.

The best State to keep Rum, both for Exportation, and other Ufes, is doubtless that of Alcohol, or rectified Spirits. In this manner, it would be contained in half the Bulk it usually is, and might be let down to the common proof Strength with Water when necessary: For the common Ufe of making Punch, it would likewise serve much better in the State of Alcohol; as the Tafte would be cleaner, and the Strength might always be regulated to a much greater Degree of Exactness than in the ordinary Way.

If the Business of rectifying Rum was more nicely managed, it seems a very practicable Scheme to throw out so much of the Oil, as to reduce it to the fine light State of a clear Spirit, but lightly impregnated with the Oil; in this State it would nearly resemble Arrac, as is easily proved by mixing a very small Quantity of it with a tasteless Spirit; for
of Distillation.

for it then bears a very near Resemblance to Arrac in Flavour.

C H A P. XX.

Of Sugar-Spirit.

We mean by a Sugar-Spirit, that extracted from the Washings, Scumings, Dross, and Waste of a Sugar-baker’s Refining-house.

These recrimentitious, or drossy Parts of the Sugar are to be diluted with Water, fermented in the same manner as Molasses or Wash, and then distilled in the common Method. And if the Operation be carefully performed, and the Spirit well rectified, it may be mixed with foreign Brandies, and even Arrac in a large Proportion, to great Advantage; for this Spirit will be found superior to that extracted from Treacle, and consequently more proper for these Uses.

C H A P. XXI.

Of Raisin-Spirits.

By Raisin-Spirits, we understand, that extracted from Raisins, after a proper Fermentation.
In order to extract this Spirit, the Raisins must be infused in a proper Quantity of Water, and fermented in the manner described in the Chapter on Fermentation. When the Fermentation is completed, the whole is to be thrown into the Still, and the Spirit extracted by a strong Fire.

The Reason why we here direct a strong Fire, is, because by that Means a greater Quantity of the essential Oil will come over the Helm with the Spirit, which will render it much fitter for the Distiller's Purpose; for this Spirit is generally used to mix with common Malt Goods; and it is surprizing how far it will go in this Respect, ten Gallons of it being often sufficient to give a determining Flavour, and agreeable Vinosity to a whole Piece of Malt Spirits.

It is therefore well worth the Distiller's while to endeavour at improving the common Method of extracting Spirits from Raisins; and perhaps the following Hint may merit Attention.

When the Fermentation is completed, and the Still charged with fermented Liquor, as above directed, let the whole be drawn off with as brisk a Fire as possible; but instead of the Cask or Can, generally used
of Distillation.

used by our English Distillers for a Receiver, let a large Glass, called by Chemists, a Separating-Glass, be placed under the Nose of the Worm, and a common Receiver applied to the Spout of the Separating-Glass; by this means the essential Oil will swim upon the Top of the Spirit, or rather low Wine, in the Separating-Glass, and may be easily preserved at the End of the Operation.

The Use of this limpid essential Oil is well known to Distillers; for in this resides the whole Flavour, and consequently may be used to the greatest Advantage in giving that distinguishing Taste, and true Vinosity, to the common Malt-Spirits.

After the Oil is separated from the low Wine, the Liquor may be rectified in Balneum Maris into a pure and almost tasteless Spirit, and therefore well adapted to make the finest compound Cordials, or to imitate or mix with the finest French Brandies, Arracs, &c.

In the same Manner a Spirit may be obtained from Cyder. But as its particular Flavour is not so desirable as that obtained from Raisins, it should be distilled in a more gentle Manner, and carefully rectified in the Manner we shall shew in the Chapter on Rectifi-
A Complete System

Rectification; by which Means a very pure and almost insipid Spirit will be obtained, which may be used to very great Advantage in imitating the best Brandies of France, or in making the finest compound Waters or Cordials.

C H A P. XXII.

Of Arracs.

What is properly meant by the Term Arracs, are Spirits extracted from the fermented Juice of certain Trees common in the East-Indies, particularly those of the Cocoa, or Palm-tree. The whole Process of making Arrac, is performed in the following Manner.

In order to procure the vegetable Juice for this Operation, the Person provides himself with a sufficient Number of small earthen Pots, with Bellies and Necks, resembling our common glass Bottles; a Number of these he fastens to his Girdle, or to a Belt across his Shoulders, and climbs up the tall Trunk of the Cocoa tree: Having reached the Boughs of the Tree, he cuts off with a Knife certain small Buds, or Buttons, applying immediately to the Wound one of his Bottles, and fastens it with a String to the Bough. In this Manner he proceeds