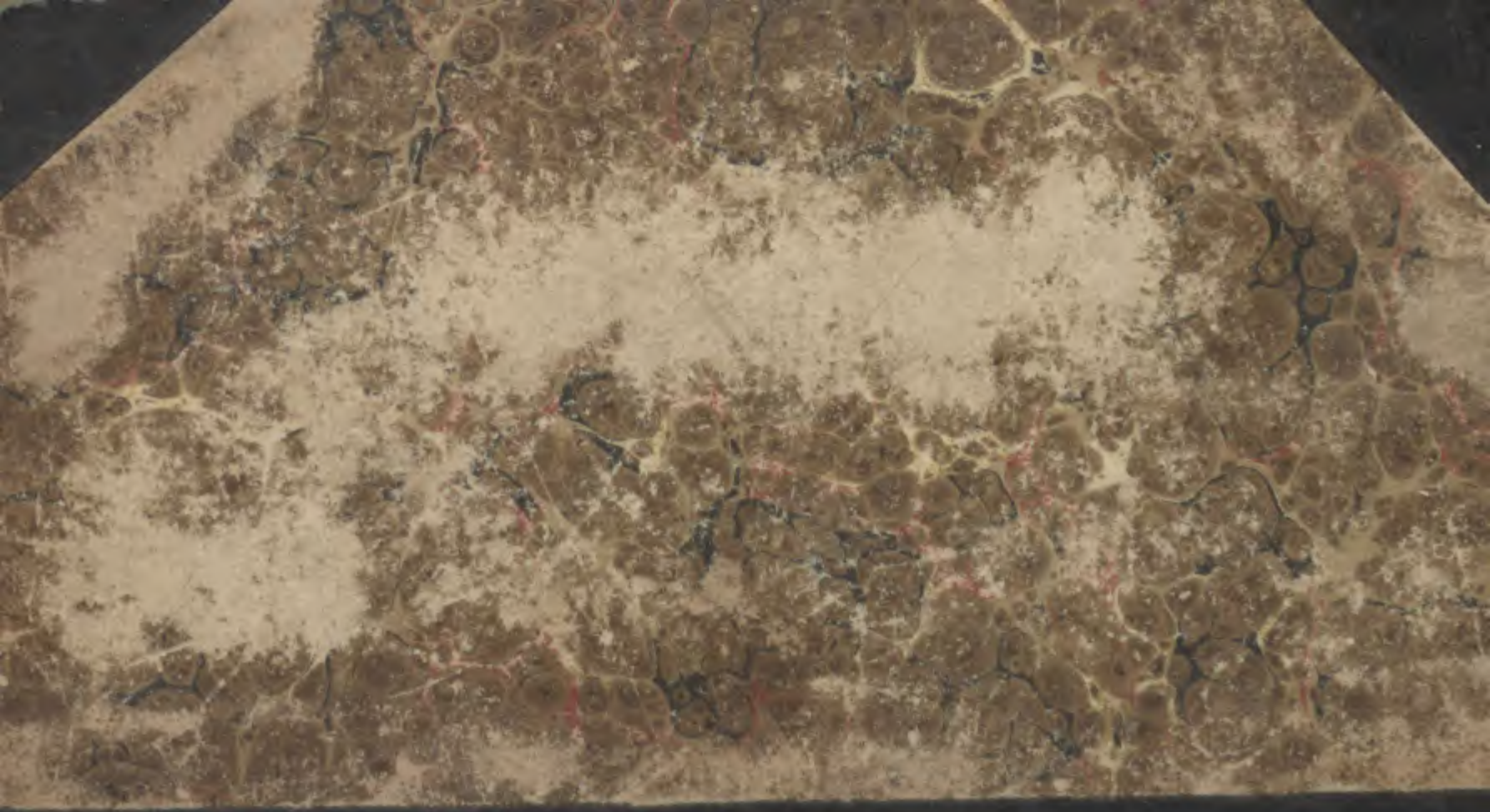

£28

B

lacks frontispiece

THE COMPLETE

DOMESTIC DISTILLER;

CONTAINING,

I. The Method of performing the various Processes of Distillation, with Descriptions of the several Instruments; the whole Doctrine of Fermentation; the Manner of drawing Spirits from Malt, Raisins, Molasses, Sugar, &c. and of Rectifying them; with Instructions for imitating, to the greatest Perfection, both the Colour and Flavour of French Brandies.

II. The Manner of Distilling all Kinds of Simple Waters from Plants, Flowers, &c.

III. The Method of Making all the Compound Waters and rich Cordials so largely imported from France and Italy; as likewise all those now made in Great Britain.

TO WHICH ARE ADDED,

ACCURATE DESCRIPTIONS OF THE SEVERAL DRUGS, PLANTS, FLOWERS, FRUITS, &c. USED BY DISTILLERS; AND INSTRUCTIONS FOR CHUSING THE BEST OF EACH KIND.

THE WHOLE DELIVERED IN THE PLAINEST MANNER,

FOR THE USE BOTH OF

DISTILLERS AND PRIVATE FAMILIES.

ILLUSTRATED WITH A PLATE.

A NEW EDITION, CORRECTED AND REVISED.

BY A. COOPER, DISTILLER.

LONDON:

PRINTED FOR THOMAS TEGG, 73. CHEAPSIDE;
R. GRIFFIN AND CO. GLASGOW; AND WESTLEY AND TYRRELL, DUBLIN.

1826.

Printed by Walker & Greig,
Edinburgh.

PREFACE.

It is now some years since I first formed a design of compiling a Complete System of Distillation; and accordingly read most of the treatises on that subject, and extracted from each what I thought necessary for my purpose, proposing to supply the defects from my own experience. It is, however, more than probable, that this design had never been executed, had not a French Treatise of Distillation fallen into my hands; but finding in that book many useful observations, and a great number of receipts for making various sorts of compound waters and cordials, I determined to finish the work I had

begun, being now enabled to render it much more useful than it was possible for me otherwise to have done. What I have translated from this author will, I dare say, be kindly received by our distillers, as the manner of making many of the foreign compound waters, &c. has never before been published in the English language. And I flatter myself, if the several hints interspersed through this Treatise are carefully adverted to, Distillation may be carried to a much greater degree of perfection than it is at present; and the celebrated compound waters and cordials of the French and Italians, imported at so great an expense, and such detriment to the trade of this nation, may be made in England equal to those manufactured abroad.

My principal intention being to render this Treatise useful to all, I have en-

deavoured to deliver every thing in the plainest and most intelligible manner. Beauty of style is not, indeed, to be expected in a work of this nature; and therefore, if perspicuity be not wanting, I presume the Reader will forgive me, if he meets with some passages that might have been delivered in a more elegant manner. I have also, for the same reason, avoided, as much as possible, terms of art, and given all the receipts in words at length.

Distillation, though long practised, has not been carried to the degree of perfection that might reasonably have been expected. Nor will this appear surprising if it be considered, that the generality of distillers proceed in the same beaten track, without suspecting their art capable of improvement, or giving themselves any trouble to inquire into the *rationale* of the processes

they daily perform. They imagine, that the theory of Distillation is very abstruse, and above the reach of common capacities; or, at least, that it requires a long and very assiduous study to comprehend it; and therefore content themselves with repeating the processes, without the least variation. This opinion, however ridiculous it may appear to those not acquainted with the present practice of distillers, has, I am satisfied, been the principal cause why Distillation has not been carried to the height it would otherwise have been. I have, therefore, endeavoured in the following Treatise to destroy this idle opinion, and shew the distiller how he may proceed on rational principles, and direct his inquiries in such a manner as cannot fail of leading him to such discoveries in his profession, as will be attended with advantage both to himself and his country.

But it is not to those only who make Distillation their profession that I have laboured to render this Treatise useful; I have also endeavoured to extend its utility to those who distil simple and compound waters for their own use, or to distribute to their indigent neighbours. And for this reason I have adapted most of the receipts to small quantities, and briefly enumerated the virtues and uses of each composition.

The short descriptions of the most capital ingredients, and the directions for chusing the best of each kind, I flatter myself, will not be considered as improper; because the goodness of every composition must, in a great measure, depend on the goodness of the ingredients.

CONTENTS.

PART I.—Of the Distillation of Spirits.

A

COMPLETE SYSTEM

OF

DISTILLATION.

DISTILLATION is the art of separating, or drawing off the spirituous, aqueous, and oleaginous parts of a mixt body, from the grosser and more terrestrial parts, by means of fire, and condensing them again by cold.

We shall therefore divide this treatise into three parts: in the first, we shall explain the method of distilling spirits from various substances; in the second, the manner of drawing simple waters; and in the third, the best methods of making cordial or compound waters.

PART I.

OF THE DISTILLATION OF SPIRITS.

By the distillation of spirits is to be understood the art by which all inflammable spirits, brandies, rums, arracks, and the like, are procured from vegetable substances, by the means of a previous fermentation, and a subsequent treatment of the fermented liquor by the alembic, or hot still, with its proper worm and refrigeratory.

But as it is impossible to extract vinous spirits from any vegetable subject without fermentation, and, previous to this, brewing is often necessary, it will be requisite first to consider these operations.

CHAPTER I.

OF BREWING, IN ORDER TO THE PRODUCTION OF INFLAMMABLE SPIRITS.

By brewing, we mean the extracting a tincture from some vegetable substance, or dissolv-

ing it in hot water, by which means it becomes proper for a vinous fermentation.

A solution, or fermentable tincture of this kind, may be procured, with proper management, from any vegetable substance, but the more readily and totally it dissolves in the fluid, the better it is fitted for fermentation, and the larger its produce of spirits. All inspissated vegetable juices therefore, as sugar, honey, treacle, manna, &c. are very proper for this use, as they totally dissolve in water, forming a clear and uniform solution; but malt, for its cheapness, is generally preferred in England, though it but imperfectly dissolves in hot water. The worst sort is commonly chosen for this purpose; and the tincture, without the addition of hops, or trouble of boiling it, is directly cooled and fermented.

But in order to brew with malt to the greatest advantage, the three following particulars should be carefully attended to: First, The subject should be well prepared; that is, it should be justly malted, and well ground; for if it be too little malted, it will prove hard and flinty, and consequently only a small part of it dissolve in

the water: and, on the other hand, if too much malted, a great part of the finer particles, or fermentable matter, will be lost in the operation. With regard to grinding, the malt should be reduced to a kind of coarse meal; for experience has shewn, that by this means the whole substance of the malt may, through the whole process, continue mixed with the tincture, and be distilled with it; whereby a larger quantity of spirit will be obtained, and also great part of the trouble, time, and expense in brewing, saved. This secret depends upon thoroughly mixing, or briskly agitating the meal, first in cold water, and then in hot; and repeating this agitation after the fermentation is finished; when the thick turbid wash must be immediately committed to the still. And thus the two operations of brewing and fermenting may very commodiously be reduced to one, to the no small profit and advantage of the distiller.

The second particular to be attended to, is, that the water be good, and properly applied. Rain water is the best adapted to brewing; for it not only extracts the tincture of the malt better than any other, but it also abounds in fermentable parts, whereby the operation is quick-

ened, and the yield of the spirit increased. The next to that of rain, is the water of rivers and lakes, particularly such as wash any large tract of a fertile country, or receive the sullage of populous towns. But whatever water is used, it must stand in a hot state upon the prepared malt, especially if a clear tincture be desired; but the greatest care must be taken to prevent the malt from running into lumps or clods; and, indeed, the best way to prevent this is to put a small quantity of cold water to the malt first, and mix them well together, after which the remaining quantity of water may be added in a state of boiling, without the least danger of coagulating the malt, or what the distillers call making a pudding.

It has been found by experience, that a certain degree of heat is necessary to extract the whole virtue of the malt: this degree may, by the above method, be determined to the greatest exactness, as the heat of boiling water may at once be lessened to any assigned degree of warmth by a proper addition of cold water; due regard being had to the season of the year, and the temperature of the air. This improvement, with that mentioned above, of reducing the two ope-

rations of brewing and fermentation to one, will be attended with considerable advantage.

With regard to the proper quantity of water, it must be observed, that if too little be used, a viscid clammy mixture will be produced, little disposed to ferment, nor capable of extracting all the soluble parts of the malt. On the other hand, too much water renders the tincture thin and aqueous, and by that means increases the trouble and expense in all parts of the operation. A due medium, therefore, should be chosen; and experience has shewn, that a wash about the goodness of that designed by the London brewers for ten shilling beer, will best answer the distiller's purpose. When a proper quantity of water is mixed with the malt, the whole mass must be well agitated, that all the soluble parts of the malt may often come in contact with the aqueous fluid, which being well saturated after standing a proper time, must be drawn off, fresh water poured on, and the agitations repeated, till the whole virtue, or saccharine sweetness of the malt is extracted, and only a fixed husky matter remains, incapable of being dissolved by either hot or cold water.

The third requisite particular is, that some certain additions be used, or alterations made, according to the season of the year, or the intention of the operator. The season of the year is very necessary to be considered. In the summer, the water applied to the malt must be colder than in the winter; and in hot sultry weather, the tincture must be suddenly cooled, otherwise it will turn eager; and, in order to check the too great tendency it has to fermentation when the air is hot, it will be necessary to add a proper quantity of unmalted meal, which being much less disposed to fermentation than malt, will greatly moderate its impetuosity, and render the operation suitable to the production of spirits, which, by a too violent fermentation, would in a great measure be dissipated and lost.

CHAPTER II.

OF FERMENTATION.

The tincture, or, as the distillers call it, the wash, being prepared, as in the foregoing chapter, it is next to be fermented; for, without this operation, no vinous spirit can be produced.

By fermentation is meant, that intestine motion performed by the instrumental efficacy of water, whereby the salt, oil, and earth of a fermentable subject are separated, attenuated, transposed, and again collected, and recomposed in a particular manner.

The doctrine of fermentation is of the greatest use, and should be well understood by every distiller, as it is the very basis of the art; and, perhaps, if more attended to, a much purer spirit, as well as a greater quantity of it, might be procured from the same materials than at present. We shall therefore lay down a concise theory of fermentation, before we proceed to deliver the practice.

Every fermentable subject is composed of salt, oil, and a subtle earth; but these particles are so small, that, when asunder, they are imperceptible to the senses; and, therefore, when mixed with an aqueous fluid, they leave it transparent: neither have fermentable bodies any taste, except that of sweetness.

These particles are each composed of salt, oil, and earth, intimately mixed in an actual cohe-

sion, connexion, and union; and, therefore, when any one of those principles too much abounds in any subject, so that an intimate union is prevented, the whole efficacy of the fermentation is either stopped or impaired, or at least limited to one certain species.

This equal connexion of salt, oil, and earth, into a single compound particle, forms a corpuscle soluble in water; or to speak more philosophically, this compound corpuscle is, by means of its saline particles, connected with the aqueous corpuscles, and moved up and down with them. But where these corpuscles are not thus connected with the water, a number of them join together, and form either a gross, or a loose, chaffy, and spungy matter.

When these compound particles are diluted with a small quantity of an aqueous fluid, they feel slippery, clammy, and unctuous to the touch, and affect the taste with a kind of ropy sweetness. And when a proper quantity of the fluid is added, a commotion is presently excited, and afterwards a subtle separation.

This commotion and separation first begins in

the whole substance; for before the addition of water, the subject may remain in dry, solid, and large pieces, as in malt, sugar, &c. which being reduced to powder, each grain thereof is an agreement of many smaller compound corpuscles: these being put into water, dissolve, and separately float therein, till at length they become so small as to be invisible, and only thicken the consistence of the liquor.

These corpuscles being thus separated from one another, there next ensues a separation of their component particles; that is, the salt, the oil, and the earth, are divided by the interposition of the aqueous particles.

The first commotion is no more than a bare solution; for the saline particles being easily dissolvable in water, they are immediately laid hold of by the aqueous particles, and carried about with them. But the succeeding separation, or fermentative motion, is a very different thing; for by this the saline particles are divided from those of oil and earth, partly by the impulse of the others in their motion, and partly by the force of the aqueous particles, which are now continually meeting and dashing against them.

This motion is performed by the water, as a fluid, or aggregate of an infinite number of particles, in actual and perpetual motion; their smallness being proportionable to that of the fermenting corpuscles, and their motion, or constant susceptibility of motion, by warmth, and the motion of the air, disposing them to move other subtle moveable corpuscles also. The certain agreement of figure, or size, between the aqueous particles, and those of the salt in the fermentable subject, tends greatly to increase this commotion; for, by this means, they are readily and very closely connected together, and therefore move almost like one and the same compound corpuscle; whilst the water is not at all disposed to cohere immediately with either the oil or earth. And thus an unequal concussion is excited in the compound corpuscles of the fermentable subject; which concussion at length strikes out the saline particle, loosens the others, and finally produces a separation of the original connexion of the subject.

An aqueous fluid, therefore, is the true, and indeed the only instrument for procuring a fermentable motion in these compound corpuscles of the subject: for were an oily fluid poured upon

any fermentable subject, no vinous fermentation would ensue; as the oil could neither give a sufficient impulse on the compound corpuscles, which are grosser than its own constituent particles, nor divide the oily or saline particles of the subject from their connexion with the others, which detain, and, as it were, envelop or defend them from its action.

The compound corpuscles of the fermentable subject being affected by the perpetual motion of the particles of the aqueous fluid, a proper degree of motion is necessary, or that the particles move with a proper degree of velocity, which principally depends on external heat. A considerable degree of cold, indeed, will not absolutely prevent fermentation, though it will greatly retard it; and a boiling heat will prevent it still more. A tepid, or middle degree of heat between freezing and boiling, is therefore the most proper for promoting or quickening the operation.

The admission of air, also, though not of absolute necessity, yet greatly promotes and quickens the action, as being a capital instrument in putting in a proper degree of motion, the oily

particles of the subject. But whilst the air thus contributes to hasten the effect, it causes at the same time by its activity some remarkable alterations in the oily particles; for it not only moves, but absolutely dissolves and displaces them from their original connexions, and thus carries them off with itself from the whole mass. And, therefore, though the consideration of the air does not so properly belong to fermentation in the general, yet it does in particular, as having an accidental power to alter every species of this operation; consequently its agency ought to be well understood, either to procure alterations at pleasure in the fermenting mass, or to prevent and correct impending dangers.

The oily particles thus separated and dissolved by the air are also elastic, though they probably derive that property from their intercourse with the air itself, and their being rendered extremely minute.

When, therefore, an aqueous fluid is added to a fermentable subject, exposed to a temperate heat, a fermentative struggle immediately arises, the saline part of the compound particles being dissolved by the continual intestine motion of the

water, and carried up and down with it in all directions, amidst an infinite number of other particles, as well fermentable as aqueous ones; whence, by this collision and attrition, the saline particles are dissolved, and separated from their connexion with the oily and earthy. And as the oily particles are the most subtle and elastic, they would, by this means, be thrown up to the surface of the liquor, and carried off by the air, were they not closely connected with the earthy ones, whose gravity prevents their evaporation, and, by coming in contact with others of the same kind, form aggregations, and sink down with the oily particles to the bottom. But before these can form a bulk too large to be supported by the water, many of the oily particles are, by their frequent collisions with the aqueous fluid, separated from the earthy ones, and by degrees more strongly connected again with the saline ones; whilst, on the other hand, the same saline particles imbibe some of the earthy ones, which being left single, upon their separation from the oily particles, floated about separately in the fluid.

And hence proceed the several different consequences of fermentation; viz. 1. From the separation of the saline particles of the ferment-

able subject, proceeds the tart, saline, or acid taste of the liquor; which is more sensible at first, before the liquor is duly composed and settled, or the due arrangement and connexion of the saline particles with those of the oily and earthy kinds completed; after which the liquor proves milder, softer, or less pungent. 2. From the oily particles being set at liberty, proceeds the strong smell of the liquor, and the head or shining skin upon the surface. 3. The earthy particles collecting together in clusters, cause the fluid to appear turbid, and afterwards a visible earthy or clay-like matter to be precipitated: and some of the earthy parts, in their motion, arriving at the head, or oily skin on the surface, cause it to thicken; and afterwards taking it down along with it, thus constitute the lees which abound in oil. 4. From this new struggle or collision, which is productive both of solution, and a new connexion in the saline and earthy corpuscles, proceeds the ebullition in fermentation. And, lastly, by the same repeated coalition of the oily with the aqueous and saline particles, the inflammable spirit is produced.

Having thus laid down a concise theory of fermentation, we shall now proceed to the practice.

The wash being brought to a tepid or luke-warm state in the backs, a proper quantity of a good-conditioned ferment is added; but if the ferment be solid, it should be previously broke into small pieces, and gently thinned either with the hand, whisp, &c. in a little of the tepid liquor. A complete and uniform solution, however, should not be attempted, because that would greatly weaken the power of the ferment, or destroy its future efficacy. The whole intended quantity, therefore, being thus loosely mixed with a moderate parcel of the liquor, and kept in a tepid state, either by setting it near the fire or otherwise, and free from the too rude commerce of the external air; more of the insensibly warm liquor ought to be added, at proper intervals, till at length the whole quantity is properly set to working together. And thus, by dividing the business into parts, it may much more speedily and effectually be performed, than by attempting it all at once.

The whole quantity of liquor being thus set to work, secured in a proper degree of warmth, and defended from a too free intercourse of the external air, nature itself, as it were, finishes the process, and renders the liquor fit for the still.

By ferments, we mean any substance, which, being added to any rightly disposed fermentable liquor, will cause it to ferment much sooner and faster than it would of itself, and, consequently, render the operation shorter; in contradiction to those abusively called so, which only correct some fault in the liquor, or give it some flavour. Hence we see, that the principal use of ferments is to save time, and make dispatch in business; whilst they only occasionally, and, as it were by accident, give a flavour, and increase the quantity of spirit. And, accordingly, any fermentable liquor may, without the addition of any ferment, by a proper management of heat alone, be brought to ferment, and even more perfectly, though much slower, than with their assistance.

These ferments are, in general, the flowers and fæces of all fermentable liquors, generated and thrown to the surface, or deposited at the bottom, either during the act of fermentation, or after the operation is finished.

Two of these are procurable in large quantities, and at a small expense; we mean beer-yeast and wine-lees; a prudent and artificial management,

or use of which, might render the business of distillation much more facile, certain, and advantageous.

It has been esteemed very difficult, and a great discouragement in the business of distillation, to procure a sufficient stock of these materials, and preserve them at all times ready for use. The whole secret consists in dexterously freeing the matter from its superfluous moisture; because, in its fluid state, it is subject to a farther fermentation, which is productive of corruption; in which state it becomes intolerably fœtid and cadaverous.

The method of exposing it to the air till it has acquired a proper consistence, is subject to great inconveniencies; and so peculiar and careful a management necessary, that it rarely succeeds.

The best way, therefore, is to press it very slowly and gradually, in a thick, close, and strong canvass bag, after the manner of wine-lees, by the tail-press, till it becomes a kind of cake, which, though soft, will easily snap, or break dry and brittle between the fingers. Be-

ing reduced to that consistence, and closely packed up in a tight cask, it will remain a long time uncorrupted, preserve its fragrancy, and consequently, fit to be used for fermenting the finest liquor.

The same method is also practicable, and to the same advantage, in the flowers or yeast of wine; which may be thus commodiously imported from abroad: Or, if these cannot be procured, others of equal efficacy may be procured from fresh wine-lees, by barely mixing and stirring them into a proper warm liquor; whence the lighter, or more volatile and active parts of the lees, will be thrown to the surface, and may easily be taken off, and preserved, by the above-mentioned method, in any desired quantity. And hence, by a very easy process, an inexhaustible supply of the most useful ferments may be readily and successively procured, so as to prevent for the future all occasion of complaint for want of them in the distiller's business.

Experience has demonstrated, that all ferments abound much more in essential oil than the liquor which produced them; and consequently they retain, in a very high degree, the smell and flavour

of the subject. It is therefore requisite, before the ferment is applied, to consider what flavour is intended to be introduced, or what species of ferment is most proper for the liquor.

The alteration thus caused by ferments is so considerable, as to render any neutral fermentable liquor of the same flavour with that which yielded the ferment. This observation is of much greater moment than will presently be conceived; for a new scene is hereby opened, both in the business of distillation, and others depending upon fermentation. It must, however, be observed, that its benefit does not extend to malt, treated in the common method; nor to any other subject but what affords a spirit tolerably pure and tasteless: for, otherwise, instead of producing a simple, pure, and uniform flavour, it causes a compound, mixed, and unnatural one. How far the fine stiller may profit by it, well deserves his attention; and whether our native cyder spirit, crab spirit, &c. which have very little flavour of their own, may not, by this artifice, be brought nearly, if not entirely, into the state of some foreign brandies, so highly esteemed, is recommended to experience.

It is common with distillers, in order to increase the quantity of spirit, give it a particular flavour, or improve its vinosity, to add several things to the liquor during the time it is in a state of fermentation; and these additions may properly be reduced to salts, acids, aromatics, and oils.

All rich vegetable juices, as treacle, honey, &c. which either want a natural acid, have been deprived of it, or contain it in too small a quantity, will be greatly improved by adding, at the beginning of the operation, a small quantity of the vegetable or fine mineral acids; as oil of sulphur, Glauber's spirit of salt, juice of lemons, or an aqueous solution of tartar. These additions will either give, or greatly improve the vinous acidity of the subject, but not increase the quantity of the spirit, that intention being performed by aromatics and oils.

All pungent aromatics have a surprising quality of increasing the quantity of the spirit, as well as in altering or improving the flavour; but their use requires that the fermentation should be performed in close vessels. And if a large quantity be intended to be added, care must be taken not to do it all at once, least the oiliness of the

ingredients should check the operation. But if the flavour be the principal intention, they should not be added till the operation is nearly finished. After the same manner, a very considerable quantity of any essential vegetable oil may be converted into a surprisingly large quantity of inflammable spirit; but great caution is here also necessary not to drop it too fast, or add too large a quantity at a time, which would damp the fermentation: it being the surest method of checking, or totally stopping this operation, at any point of time required. The best method, therefore, of adding the oil, so as to avoid all inconveniencies, is to rub the oil in a mortar with sugar, which the chemists call making an *Olæsaccharum*, by which means the tenacity of the oil will be destroyed, and the whole readily mix with the liquor, and immediately ferment with it. The distiller would do well to consider these observations attentively, as he may thence form an advantageous method of increasing the quantity of spirits, and at the same time greatly improve their quality and flavour.

But in order to put these observations in practice, particular regard must be had to the containing vessel in which the fermentation is per-

formed, the exclusion of the air, and the degree of the external heat or cold.

With regard to the containing vessel; its purity, and the provision for rendering it occasionally close, are chiefly to be considered. In cleansing it, no soap, or other unctuous body should be used, for fear of checking the fermentation; and, for the same reason, all strong alkaline lixiviums should be avoided. Lime-water, or a turbid solution of quicklime, may be employed for this purpose, without producing any ill effect: it will also be of great service in destroying a prevailing acetous salt, which is apt to generate in the vessels when the warm air has free access to them; and tends to pervert the order of fermentation, and, instead of a wine or wash, produces a vinegar. Special care must also be had, that no remains of yeast, or cadaverous remains of former fermented matters, hang about the vessels, which would infect whatever should be afterwards put into them, and cannot, without the utmost difficulty, be perfectly cured and sweetened.

The occasional closeness of the vessels may, in the large way, be provided for by covers properly

adapted; and, in the small way, by valves, placed in light casks. These valves will occasionally give the necessary vent to preserve the vessel, during the height of the fermentation; the vessel otherwise remaining perfectly close, and impervious to the air.

It is a mistake of a very prejudicial nature, in the business of fermentation, to suppose that there is an absolute necessity for a free admission of the external air. The express contrary is the truth, and very great advantages will be found by practising according to this supposition. A constant influx of the external air, if it does not carry off some part of the spirit already generated, yet certainly catches up and dissipates the fine, subtle, or oleaginous and saline particles whereof the spirit is made, and thus considerably lessens the quantity. By a close fermentation this inconveniency is avoided; all air, except that included in the vessel, being excluded. The whole secret consists in leaving a moderate space for the air at the top of the vessel, unpossessed by the liquor; when the liquor is once fairly at work, to bung it down close, and thus suffer it to finish the fermentation, without opening, or giving it any more vent than that afforded it by a

proper valve placed in the cask; which, however, is not of absolute necessity, when the empty space, or rather that possessed by the air, is about one-tenth of the gage; the artificial air, generated in the operation, being then seldom sufficient to open a strong valve, or at most, not to endanger the cask.

This method may be practised to good advantage by those whose business is not very large; but it requires too much time to be used by the large dealers, who are in a manner forced to admit the free air, and thus sustain a considerable loss in their quantity of spirit, that the fermentation may be finished in the small time allowed for that purpose. It may, however, be said, that the silent, slow, and almost imperceptible vinous fermentation, is universally the most perfect and advantageous.

During the whole course of this operation, the vessel should be kept from all external cold, or considerable heat, in an equal, uniform, and moderate temperature. In the winter, a stove-room, such as is common in Germany, would be very convenient for this purpose, the vessel being placed at a proper distance from the stove; but at

other seasons no particular apparatus is necessary with us in England, if the place allotted for the business be but well defended from the summer's heat, and the ill effects of cold bleak northern winds.

The operation is known to be perfected when the hissing, or small bubbling noise, can be no longer heard, upon applying the ear to the vessel; and also by the liquor itself appearing clear to the eye, and having a pungent sharpness on the tongue. And that it may fully obtain these properties, and be well fitted to yield a pure and perfectly vinous spirit by distillation, it should be suffered to stand at rest in a somewhat cooler place, if practicable, than that in which it was fermented; till it has thoroughly deposited and cleansed itself of the gross lee, and become perfectly transparent, vinous, and fragrant; in which state it should be committed to the still, and the spirit obtained will not only exceed that obtained in the common way in quantity, but also in fragrance, pungency, and vinosity.

CHAPTER III.

OF DISTILLATION IN GENERAL.

HAVING, in the two preceding chapters, laid down the best methods of brewing and fermentation, we shall now proceed to the method of distillation.

And in order to lead our readers methodically through the path which lies before them, we shall begin with explaining the principles of distillation, or, the method of extracting the spirituous parts of bodies.

To extract the spirits is to cause such an action by heat, as to cause them to ascend in vapour from the bodies which detain them.

If this heat be natural to bodies, so that the separation be made without any adventitious means, it is called fermentation, which we have already explained.

If it be produced by fire, or other heating power, in which the alembic is placed, it is called digestion, or distillation: digestion, if the heat only prepares the materials for the distillation of their spirits; and distillation, where the action is of sufficient efficacy to cause them to ascend in vapour, and distil.

This heat is that which puts the insensible parts of a body, whatever it be, into motion, divides them, and causes a passage for the spirits enclosed therein, by disengaging them from the phlegm and the earthy particles by which they are enclosed.

Distillation, considered in this light, is not unworthy the attention and countenance of the learned. This art is of infinite extent: whatever the whole earth produces, flowers, fruits, seeds, spices, aromatic and vulnerary plants, odoriferous drugs, &c. are its objects, and come under its cognizance; but we generally confine it to liquids of taste and smell, and to the simple and spirituous waters of aromatic and vulnerary plants. With regard to its utility, we shall omit saying any thing here, as we shall give sufficient proofs of it in the sequel.

CHAPTER IV.

OF PARTICULAR DISTILLATION.

DISTILLATION is generally divided into three kinds; the first is called distillation *per ascensum*, which is when the fire, or other heat, applied to the alembic containing the materials, causes the spirit to ascend. This is the most common, and indeed almost the only kind used by distillers.

The second is called distillation *per descensum;* which is when the fire, being placed upon the vessel, precipitates, or causes the spirit to descend. This kind is hardly ever used by distillers, but to obtain the essence or oil of cloves.

The third is termed distillation *per latus*, or oblique distillation; but this being used only by the chemists, we shall say nothing farther of it here.

With regard to the different methods of distillation, occasioned by the different vessels or materials made use of to excite heat, improperly

called distillation; they are of various kinds, and shall be explained as they occur in the work.

There are various kinds of distillation, some of which arise from the different constructions of alembics; such are the distillation by the common alembic with a refrigeratory, the glass alembic, the serpentine alembic, and the retort: others are produced from the heat surrounding the alembic; such as the distillation in *Balneum Mariæ*, the vapour, the sand, the dung, and the lime baths.

These different methods of distilling, we shall explain in enumerating the operations in which they are most proper; and proceed to treat of the different forms of alembics and their constructions.

CHAPTER V.

OF ALEMBICS, AND THEIR DIFFERENT CONSTRUCTIONS.

The alembic is a vessel, usually of copper tinned, which serves for, and is essential to all operations in the distillery.

There are several sorts of alembics, all different, either with regard to matter or form: As, the common alembic with a refrigeratory, the earthen and the glass alembic, the *Balneum Mariæ*, and the vapour-bath alembic.

Every one of these being of a different construction, are also used in different operations.

The common alembic consists principally of two parts, the lower part called the body, and the upper termed the head.

The body consists of two pieces, the lower called the cucurbit, and the upper the crown. The cucurbit, or lower part of the body, is a kind of receptacle proportioned to the size of the alembic, in which the bodies to be distilled are placed.

The crown, or upper part of the body, is also another part of the alembic; and is that part of the body to which the head is immediately luted. But an idea of these several alembics will be much better attained from the following figures, which represent them much stronger to the imagination than is possible to be done by words.

Fig. 1. Is a common alembic, as it appears before it is placed in a furnace, where *a* is the bottom, *b* the crown, *c* the head.

Fig. 2. Is the body without the head; *a* the rim or top of the crown where the head is luted.

Fig. 3. The head; *a* the rim where it is to be luted to the body; *b* the nose, or end which is luted into the worm.

Fig. 4. The worm, as it appears when out of the tub, in which it is fixed when in use; *a* the end into which the still-head is inserted, *b* that which conveys the liquor into the receiver.

Fig. 5. Two stills at work in one refrigeratory; *a b* the two still heads, *c d* the bodies enclosed in the brick-work, *e e* the two fire-places; *f f* the two ash-holes; *g* a common receiver, *h* a spout-receiver, called by chemists a separating-glass, used in the distillation of herbs in order to extract their essential oil; a crane for drawing the water out of the refrigeratory.

Fig. 6. A small still with a refrigeratory; *a* the body, *b* the head, *c* the refrigeratory filled with

water, *d* the receiver, luted to the bec of the alembic.

Fig. 7. A glass alembic to be used as a *Balneum Mariæ; a* the body, *b* the head, *c* the bec, which is to be luted to the receiver, *d* a trivet on which it is standing in the water.

Fig. 8. A proper receiver for the glass alembic, called by chemists a bolt-head, or matrass.

Fig. 9. The glass alembic placed in a copper vessel; *a* the copper vessel filled with water, *b* the body of the glass alembic, *c* the head, *d* the receiver luted at *e* to the bec of the alembic.

Fig. 10. A cold still for distilling simple waters; *a* the head, *b* the bec or nose, *c* the receiver, *d* the plate on which herbs are laid.

Fig. 11. A vessel for digestion, called by chemists a pelican or circulatory vessel; *a* the body, *b* the head, *c c* two tubes, luted at *d d*, by which the liquor returns from the head into the body.

Fig. 12. Another receiver used when it is necessary to lute it to the end of the worm, in order to prevent the most volatile parts from being evaporated and lost.

CHAPTER VI.

OF THE ACCIDENTS THAT TOO OFTEN HAPPEN IN PERFORMING THE PROCESSES OF DISTILLATION.

AMONG the accidents which frequently happen in distilling, the least of all is for the operation to miscarry, and the ingredients to be lost.

And this being a subject of the greatest importance, we shall treat it with all possible accuracy.

All accidents are occasioned by fire, their primary cause: by want of attention they get too much head, and fear often suffers them to become irremediable.

The first accident which may happen by the fire, is when a distiller, by too great a heat,

causes the ingredients to be burnt at the bottom of the still; by this means his liquor is spoiled by an empyreumatic taste, and the tin is melted off from the alembic. An empyreuma resembles the smell of burnt tobacco, and is produced in liquors by too great a degree of heat. To illustrate this, distil any fruit, flowers, or any aromatic whatever, but especially something whose smell is very volatile; draw off only the best, unlute the alembic, and what remains in the still will be found to have a very disagreeable smell; whence it follows, that if a little more had been drawn off, it would have spoiled what was before obtained.

If the fire be too violent, the extraordinary ebullition of the contents causes them to ascend into the head; and, if a glass alembic, they fall ignited into the recipient; the heat breaks it, the spirits are dissipated, and often take fire from the heat of the furnace.

If the fire be too strong, the bottom of the still becomes red-hot, the materials inflamed, and consequently the fire reaches the recipient.

When an earthen alembic is used, the closest

attention is requisite to keep the fire from burning the materials at the bottom. The head, which is always of glass, bursts, and the spirits are spilt, and often catch fire. And the remedy becomes the more difficult, as earth retains the fire much longer than a common alembic.

If the alembic be not firmly fixed, it is soon put out of order, falls down, and unlutes itself; thus the liquor is spilt, and the vapour sets the spirits on fire.

If all the joints be not carefully luted, the spirits at their first effort issue through the least aperture, run into the fire, which is propagated into the alembic by the vapour.

In distillations where the phlegm ascends first, its humidity penetrates the lute, and loosens it; so that when the spirituous vapours ascend, they are exposed to the same accident.

Lastly, when the recipient is unluted, especially if near full, without the greatest circumspection the spirits will be spilt, and so catch fire.

Hitherto I have only given a simple account of what daily happens to distillers; but the consequences of these accidents are infinitely more terrible than the accidents themselves: For an artist to lose his time, his labour, and goods, is no small matter; but it follows from what we have premised, that both his life and fortune are in danger from these conflagrations. Instances of the former are too common, as well as those of the latter, relating to the danger to which the operator is exposed. They are evident, and we have seen very lately three instances sufficient to intimidate the most sanguine. The spirits catch, the alembic and recipient fly, and the inflamed vapour becomes present death to all who breathe it.

The rectifiers, who perform the most dangerous operations of distillery, are particularly exposed to these terrible accidents: the fineness of the spirit, at the same time that it renders it more inflammable, also causes the fire to spread with the greater rapidity. And when their storehouses are once on fire, they are seldom or never saved.

Possibly I may be censured for my conciseness on this head; indeed, the importance of it

requires the most particular discussion; but intending to speak of the methods proper to prevent these accidents, I shall close this chapter with recommending the subject of it to the serious reflection of all concerned in distillation. And it being hitherto omitted, though of all others it requires the attention of the distiller, I shall further observe, that these operations should never be left to servants. What can be expected from ignorant persons? Fear will seize them, when the greatest presence of mind is requisite. —Let us now proceed to the methods of preventing, or at least lessening their effects.

CHAPTER VII.

OF THE METHODS OF PREVENTING ACCIDENTS.

To have informed the reader of the accidents which happen in distilling, would have been of little consequence, without shewing, at the same time, the methods of preventing them. In order therefore to fortify him against the terror which the foregoing chapter may have excited, we will here point out the remedies for all the cases before specified.

To prevent accidents, two things especially must be known, and adverted to :—

1. The knowledge of the fire, which depends on the fuel, whether wood or coal.

2. The manner of luting so as to prevent the vapours from escaping through it, and by that means of setting the whole on fire.

The hardest wood generally makes the quickest fire, such as beech, oak, holme, elm, &c. The white woods, as the ash, the poplar, the willow, and the birch, make a milder fire. This holds good also of the coal made of these two kinds of wood; and, consequently, the nature of the wood or coals must determine the fire, and the action of this must be proportioned to the effect intended to be produced by it: That is, the capacity of the alembic, the matters to be distilled, and their quantity. The same may also be said of pit coal, which is generally used in England.

It is evident, that the larger the alembic, the more fire is necessary. What has not been digested, also, requires more fire than that which has been prepared by that operation. Spices

require a stronger fire than flowers; a distillation of simple waters, more than that of spirituous liquors.

The surest way of ascertaining the necessary degree of fire is to regulate it by the materials, as they are more or less disposed to yield them spirits, &c. and this is done as follows. The operator must not leave the alembic, but attentively listen to what passes within, when the fire begins to heat it. When the ebullition becomes too vehement, the fire must be lessened, either by taking out some of the fuel, or covering it with ashes or sand.

It requires a long experience in the several cases, before a distiller can acquire a competent knowledge in this important point. Nor is it possible to determine the degree of fire from the quantity of fuel; judgment, assisted by experience, must supply this defect.

Every thing being determined with regard to the degree of fire, we shall now proceed to explain the method of luting alembics.

By the term luting an alembic, we mean, the

closing the joints through which the spirits might transpire.

Lute is a composition of common ashes, well sifted, and soaked in water; clay, and a kind of paste made of meal or starch, are also used for this purpose; which, as I before observed, is to close all the joints, &c. in order to confine the spirits from transpiring.

Good luting is one of the surest methods of preventing accidents; an alembic, where all transpiration is prevented, having nothing to fear but the too great fierceness of the fire; and that may be regulated by the rules already laid down.

The refrigerating alembic is mostly used. The body and the head are joined to each other; but notwithstanding the greatest care be taken in luting the juncture, there will still be some imperceptible interstice for transpiration; and the least being of the greatest consequence, a piece of strong paper should be pasted over the joint, and the alembic never left, till the spirits begin to flow into the receiver, in order to apply fresh paper if the former should contract any moisture. The master himself should carefully attend to this, and whatever precaution may have been

previously used, the eye must be constantly upon it.

The alembic, when vinous spirits are distilled, should be luted with clay, carefully spread round the junctures, in order to prevent all transpiration; because the consequences here are terrible; for when the fire catches a large quantity, it is often irremediable. Besides, as this earth cracks in drying, it must be often moistened, and fresh applied, on the first appearance of any occasion for it.

The retort is also luted with clay; but as glass retorts are also used, they are often coated with the same clay, to prevent their melting by the intenseness of the fire.

Lastly, the earthen and glass alembics are luted with paper and paste as above.—Having thus explained the great consequence of circumspection with regard to luting, and the degree of fire, we shall now proceed to a third method of preventing them, and close this chapter with a short observation on portable furnaces; which is, that alembics being never thoroughly secure on this kind of furnaces, a hook should be fastened to the refrigerant for fixing it to the wall.

CHAPTER VIII.

OF THE REMEDIES FOR ACCIDENTS, WHEN THEY HAPPEN.

NOTWITHSTANDING the best of rules, and the strictest observation, it is impossible entirely to prevent accidents; and, therefore, it is of no less importance to point out the remedies on those occasions.

The most essential are, courage and presence of mind; fear only increasing the misfortune.

1. If the fire be too violent, it must be covered; but not so as totally to prevent its action, as by that means the process of the distillation would be interrupted, and render it more difficult and less perfect.

2. When the ingredients burn, which you will soon discover by the smell, the fire must be immediately put out, in order to prevent the whole charge of the still being entirely spoiled, which would otherwise inevitably be the consequence.

3. If the spirits should catch fire, the first care is to unlute immediately the receiver, and stop both the end of the beak and mouth of the receiver with wet cloths.

The fire must then be put out; and if the flame issued through the luting, the joints must be closed with a wet cloth, which, together with water, should never be wanting in a distil-house.

4. If the alembic be of earth, and the contents burn at the bottom, the fire must immediately be put out, the alembic removed, and water thrown upon it, till the danger is over; and, for farther security, covered with a wet cloth.

5. If, after all your care in closing the junctures to prevent transpiration, you perceive any thing amiss while the spirits are ascending, apply clay, or any other composition, in order to stop the aperture, and have always a wet cloth ready to stifle the flame, if the spirits should take fire.

6. If the heat detaches the lute, or it becomes moist, immediately apply another, having always ready what is necessary for performing it. Should the transpiration be so violent that you cannot

immediately apply a fresh lute, clap a wet cloth round the joint, and keep it on firm and tight, till the spirits have taken their course. But if, notwithstanding all your efforts, the transpiration should increase, so that you fear a conflagration, remove the receiver as soon as possible from the fire, and afterwards your alembic, if portable; but if otherwise, put out the fire immediately.

7. The charge being worked off, be cautious in luting the receiver, that nothing be spilt on the furnace, and carry it to some distance from it, that the spirits exhaling may not take fire.

8. Lastly, observe, that wherever a remedy is required, there must be no candle used; for the spirituous vapours easily take fire, and propagate the flame to the vessels from whence they issue.

All that has been hitherto said, concerns only the management of the alembic; but what remains is still more interesting, and relates to those who work it, that they may not, by conquering the accident, destroy themselves.

On discovering any of the above accidents, when the flame has not yet reached the spirits,

let the remedies already mentioned be applied, either with regard to the lute, or the violence of the fire.

But if the flame has reached the alembic, the following precautions are to be used.

The operator must not approach the alembic without a wet cloth over his mouth and nostrils, it being immediate death to inhale the inflamed vapour.

In hastening to stop any accident, be careful to approach the side opposite to that whither the air impels the flame; for, without this precaution, you would be involved in it, and could not, without the utmost difficulty, extricate yourself from it.

If, notwithstanding this precaution, the eddy of the air should force the flame to your side, quit the place immediately, and do not return till its direction be changed, always taking care to have a wet linen cloth before your nose and mouth, and keep yourself on the side opposite to the direction of the flame; and also to have another such cloth, in order to smother the

flame, and close the crevice through which the spirits issue.

Should it be your misfortune to be covered with inflamed spirits, wrap yourself in a wet sheet, which should be always ready for that purpose. Self-preservation is of too great importance that any of these precautions should be omitted in such variety of dangers.

If the fire has acquired such a head that it cannot be stopt, the receiver must be broke, and the alembic, if portable, thrown down; but no person must be suffered to go near them, especially those who are strangers to the business.

In a desperate case, like that of a large quantity of rectified spirit taking fire, if time permit, the communication of the beak of the alembic with the recipient, which is usually a cask, must be cut off, by closely stopping the bung; and be sure no candle come near the receiver, leaving the rest, as the danger would be too great to expose one's self to the flames of a large charge, and the distiller's safety should be principally considered.

I thought it my duty to give my reader these informations, and hope that, in the practice of distillation, he will find them of great advantage.

CHAPTER IX.

ON THE NECESSITY OF OFTEN COOLING THE ALEMBIC, AS ANOTHER MEANS OF PREVENTING ACCIDENTS.

The refrigerant is so essential a part of the alembic, that for want of it several other expedients are made use of to perform its office, for cooling those whose capacity, brittleness, or lastly the construction, will not admit of their having any.

The refrigerant is usually in proportion to the capacity of the alembic, for which the following may serve as a rule, that the capacity of the refrigerant should be to that of the alembic, as 14 to 8.

The necessity of cooling the head of the alembic, is self-evident to all who have the least knowledge of distillation, as it condenses the

spirits, cools them, and causes them to flow into the receiver, which, if of glass, would otherwise be broken by the heat; and consequently serves to prevent conflagrations.

The alembics of the *Balneum Mariæ*, and the vapour bath, ought also to have refrigerants, like the common alembic, unless they are of glass.

Those of earth and glass are cooled, as we have already observed, with a wet cloth, which is also used to cool the head of other kinds of alembics. But it is not difficult to contrive one which may be placed in a refrigerant; such as the following:—

To a common small still apply and lute a worm, or long tin or pewter tube, forming several circumvolutions, of the same circumference with the body; in order to give it some elevation, place this worm in a refrigerant, proportioned to the alembic. If the capacity of this alembic should make it bear too much on the neck of the matrass, it may be supported by a trivet of the same circumference as the body itself: the extremity of the worm may have a beak projecting beyond the side of the refrigerant, for conveying the spirits into the receiver.

This apparatus will be attended with little expense, will save the distiller the trouble of being perpetually cooling the head of the alembic, and is such a safeguard against accidents, that if the worm be well luted, nothing need be apprehended but from the violence of the fire.

This method of practice, therefore, is productive of three valuable particulars: the first is, That by cooling the spirits it preserves the receiver, and obviates the accidents arising from their heat. The second is, That the spirits being kept in a moderate heat, the transpiration is less, and consequently the spirits procured by the operation have more taste, smell, and fragrancy, than they would otherwise have had.

Experience demonstrates, that when the spirits flow hot into the receiver, however attentive the distiller may be to lute the junctures of the alembic, there will be a very sensible evaporation, which, even in simple waters, greatly depreciates the goodness of the liquor.

Lastly, the third is, That the cooling of alembics is what principally contributes to the perfection of the operation; because the coolness of the head precipitates the phlegm, and in the case

of too great a degree of fire, and where the ebullition is too vehement, if after taking away part of the fire, or covering it, the ebullition should continue, the head may be cooled with a wet cloth, till the ebullition is reduced.

As there is a necessity of cooling the alembic, so what we have said cannot be too carefully observed. In fine, the contrast of cold and heat, equally concurring, but by methods directly opposite, to the same process, and the perfection of the distillation, is a phenomenon which deserves the attention of all who study the operations of nature.

CHAPTER X.

OF THE NECESSITY OF PUTTING WATER INTO THE ALEMBIC, FOR SEVERAL DISTILLATIONS.

Two principal advantages attend putting water into the alembic. The *first* is, to prevent the loss the distiller would incur without that precaution, and so prevent any alteration in the liquor procured by distillation. This we shall illustrate by an example. Suppose a distiller should attempt

to rectify spirits of wine, without putting water in the alembic, it is evident that the fire will consume part of it, which is entirely loss, because the same quantity of spirit cannot be procured from it, which might, had there been any thing to moderate the action of the fire which now preyed upon it.

Secondly, If liquors are impregnated with strong ingredients, especially seeds, and the quantity be sufficient to absorb all the phlegm, a great quantity of spirit must be left in the still, or the ingredients will burn, and the spirits contract an empyreumatic taste, which is the more detrimental to the spirit, as it is increased by age.

Thirdly, If no water be put into the alembic with the ingredients, the spirit will be rendered finer by them, and the fire, if ever so little too strong, will cause the ingredients to burn, and the spirits to contract an empyreuma; a misfortune easily prevented by this precaution.

Thus, it is a safeguard against accidents: but besides, water being mixed with the ingredients, they are at once prevented from burning, and the spirit not weakened; for no sooner are the ingredients put in motion by the fire, than

the spirits immediately ascend, and the liquor loses nothing of its quality, provided the receiver be removed as soon as the phlegm begins to ascend.

The water therefore prevents the waste of the spirits, and thus the distiller loses nothing of his goods; whereas, without water, the spirits, by impregnating the materials, their quantity must be less. With regard to the phlegm, there is no difficulty in finding when it begins to ascend, the first drop being cloudy, and when it has continued dropping for some time, it is perceived by a milky cast at the bottom of the receiver.

Lastly, The distiller is no loser with regard to the quality of his liquor, which is not at all weakened thereby. Thus it is attended with two capital advantages, the profit of the distiller, and the perfection of the liquor. Let us now proceed to the different manners of distillation.

CHAPTER XI.

OF THE PARTICULAR ADVANTAGES ATTENDING EVERY KIND OF DISTILLATION.

In the third chapter we mentioned the several kinds of distillation; we shall here enlarge on the particular advantages of each, and in what circumstances each is to be used.

In order for distillation, the alembic must be charged with materials, and placed on a fire, or substances capable of producing the same effect.

THE METHOD OF DISTILLING WITH THE COMMON REFRIGERANT ALEMBIC.

This method of distilling is the most generally used, being one of the most speedy and profitable, as it requires fewer preparatives, and less time.

To distil with the common alembic, the body of it must be thoroughly cleansed, that no taste or smell of any preceding materials may remain.

The materials are then to be put into the alembic; but care must be taken that the alembic be not above half full, in order that the materials may have sufficient room to move, without choaking the neck of the alembic. The same care must be taken with regard to the head, it must be thoroughly cleansed and dried; for it often happens that some small quantity of water is left in the rim, which renders the first spirits foul, and, by endeavouring to separate it from the other, some, and that the most volatile part of the spirit, will be lost.

After this, the two parts of the alembic are to be carefully luted with strong brown paper, well pasted on, and the nose of the alembic luted to the worm; after which the fire should be immediately made under the still, lest too long an infusion should prejudice the liquor.

This alembic being worked on an open fire, the operation is quicker than any other; but the degree of fire requires a very close attention, as a different management is necessary to different materials. The water of the refrigeratory must be changed from time to time, and if the case requires it, the whole head, but especially the bec, must be kept cold.

OF DISTILLATION IN SAND, AND IN WHAT CASES IT SHOULD BE USED.

This species of distillation is performed in two different manners. First, by covering the fire with sand or ashes, and placing the alembic upon it. This method is very necessary in digestion, and for the perfect rectification of spirits. Sand is absolutely necessary for moderating the action of the fire, when there is reason to fear the matter contained in the bottom of the alembic will burn.

The second method of sand distillation is, to take the finest river sand, and after thoroughly washing it, put into the alembic a quantity sufficient to cover it three fingers deep; after which the still is to be charged with the ingredients to be distilled. This serves instead of water in certain cases, where the use of it would prejudice the ingredients; as in the fine spirituous waters impregnated with the aromatic parts of flowers; the sand preventing the ingredients from burning. It is also necessary in distilling rectified spirits from seeds.

This operation being finished, the alembic must be thoroughly cleansed from the sand, that

the taste or smell contained therein, be not communicated to any other charge of different ingredients.

OF DISTILLING IN BALNEUM MARIÆ, AND ITS ADVANTAGES.

This method of distillation is of great use in several cases. Its operation is more perfect, and is subject to few, if any, of those accidents attending distillations on an open fire.

In distilling sweet-scented waters from flowers, aromatic plants, and others of that kind, where neither water nor spirit ought to be mixed with them, there is an absolute necessity for using the *Balneum Mariæ;* as by every other distillation, on an open fire, the ingredients would infallibly burn.

If sand should be made use of, the fire would melt the tin from the alembic, and the contents be in the utmost danger of being burnt.

In distilling in *Balneum Mariæ*, a glass alembic is generally used. This alembic is to be placed in a copper vessel filled with water. This vessel ought at least to be of half the height of the

alembic: at the bottom of the copper vessel must be a trivet on which the alembic is to be placed, that it may not touch the bottom of the copper, because, when the water begins to boil, it disperses itself towards the sides, and leaving the bottom dry, the ingredients would be in danger of burning.

The use of the *Balneum Mariæ* is excellent for those ingredients which require little spirit; but if a copper alembic be used, be sure to place sand at the bottom, that the distilled liquor may not contract any ill taste or smell. This method is also advisable in the rectification of spirits, on account of the danger attending this operation when performed on a naked fire.

Were this method of distillation as expeditious as that performed on a naked fire, no other ought to be used, because it is subject to no accidents, and at the same time the spirit, &c. distilled, is much more fragrant and grateful.

IN WHAT CASES GLASS OR EARTHEN ALEMBICS ARE TO BE USED; THEIR ADVANTAGES AND DISADVANTAGES.

In the chapter relating to accidents, we have

mentioned the earthen alembic; we must now add, that it ought never to be used, except the matter to be distilled have a strong and bad smell, and then seldom above once, unless it be for ingredients of the same or similar qualities.

This alembic being very difficult to be managed, we can only recommend it in the case abovementioned.

As a naked fire is generally applied to this alembic, it requires a furnace where the fire may be gradually increased, on account of the accidents to which it is liable.

The glass alembic is more easily managed, as it is generally placed in a *Balneum Mariæ.* Its principal use is for distilling waters from flowers, and making quintessences; and were it not for the length of the operation, it would be preferable to any other method.

This alembic hardly admitting of a refrigerant, a wet linen cloth must be placed on the head, and often changed.

The receiver of this alembic must not be very large, because of the fragility of the bec; but if

it were ever so little bent into a curve, the largeness of the receiver would be of no prejudice; because then its whole weight would be supported by its stand.

ADVANTAGES OF DISTILLATION PERFORMED BY THE VAPOUR BATH.

This method differs very little from the *Balneum Mariæ*, and is used nearly in the same circumstances; but has greatly the advantage of the *Balneum Mariæ* in the quickness of the operation. And LEMERY, in the first part of his course of chemistry, affirms its operation to be more perfect.

However that be, its use is equal to that of the *Balneum Mariæ;* but in distilling sweet-scented waters, or flowers, sand must be placed at the bottom, that the liquor may not contract a taste from the copper.

CASES WHERE DUNG, HUSKS OF GRAPES, AND LIME, ARE TO BE USED.

These substances are rarely used except in digestions; and therefore of no great use to

distillers, they using only hot ashes, or a fire well covered for that purpose.

If dung be used, it must be of the hottest kind, viz. that of the horse or sheep, and the quantity proportioned to the heat intended. The lime must be quick; and if the heat required be moderate, lime which has lain some time in the air must be used. The same is to be observed with regard to the husks of grapes. But in whatever manner these are used, the digestion must be performed in a close covered vessel.

CHAPTER XII.

OF BODIES PROPER FOR DISTILLATION.

This chapter alone might make a volume, were we to make a particular enumeration of all its parts; but, as we have already observed, we shall confine ourselves to the distillation of simple and compound waters, &c.

If we acquit ourselves to the satisfaction of the public, we shall enjoy the pleasure of having treated of one part entirely new; and, indeed, the only one that has been overlooked.

The bodies proper for distillation, are flowers, fruits, seeds, spices, and aromatic plants.

By distillation and digestion, we extract the colour and smell of flowers in simple waters and essences.

We extract from fruits, at least from some, colour, taste, &c.

From aromatic plants, the distiller draws spirits, essences, simple and compound waters.

From spices are procured essences, or in the language of the chemists, oils, and perfumes, and also pure spirits.

From seeds or berries are drawn simple waters, pure spirits; and from some, as those of annise, fennel, and juniper, oil.

The colour of flowers is extracted by infusion, and likewise by digestion in brandy or spirit of wine: the smell is extracted by distillation; the simple water with brandy or spirit of wine.

What is extracted of the colour of flowers, by infusion in water, by a gentle heat, or by diges-

tion in brandy or spirits of wine, is called, in the distiller's phrase, tincture of flowers.

The colour of fruits is extracted in the same manner, either by infusion or digestion: their taste is also procured by the same processes. But let it be observed, that the time of these operations must be limited; for otherwise the fruit, after fermentation, would render it acid. The taste is also extracted by distillation in spirit of wine.

From aromatic plants are extracted, by the alembic, pure spirits, odours, and simple waters. But these require different methods of distillation. The first by water or brandy only, the second by rectified spirit, which will give them the greatest excellency they are capable of.

The plants themselves with their flowers may also be distilled, which is still better.

From spices are drawn spirits, and oily or spirituous quintessences. The spirits are drawn by brandy, or spirit of wine, with very little water; the oils are distilled *per descensum;* and the spirituous quintessences by pounding the spices, and, after infusing them in spirit of wine, decanting it gently by inclination.

From seeds are extracted simple waters, spirits, and oils: very few of the first and last, spirits being what is generally extracted from seeds and berries.

Some distillers, through a notion of frugality, distil seeds with water; but their liquors are not to be compared with those which are distilled with spirits. When oils are drawn from seeds, the operation is performed either by the *Balneum Mariæ*, or the vapour bath.

We only deliver in this place the first elements of each of these operations, which will be further illustrated in the sequel, when we treat more particularly of these subjects.

CHAPTER 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 subtle 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 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 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 entangled in the phlegm, are less disposed to ascend, till the phlegm itself separates, and gives them room to fly upwards.

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 every thing 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 contract 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 the 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 shewing 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 from their confinements, whereby they are 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.

CHAPTER 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 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.

CHAPTER XV.

OF THE FILTRATION OF LIQUORS.

FILTRATION consists in passing liquors through 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 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 in a funnel, and pour the liquor through 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.

CHAPTER 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 the 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 distillers always take care to have their wash sufficiently diluted, and constantly 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 centre 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 into 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 still-head, 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 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 feculence, 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 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 Mariæ*, 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 effected, 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.

CHAPTER 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 quantities of this spirit are used in adulterating foreign brandy, rum, and arrac. 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.

Molasses, 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.

CHAPTER 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 molasses; 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 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 wines that will fetch any price as wine; for, in this state, the profits upon them are vastly greater than when reduced to brandies. This large stock of small wines, with which they are almost overrun 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 cider 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 to deviate from the beaten track, though they have the fairest prospect of acquiring profit to themselves, and a lasting emolument to their country.

CHAPTER 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 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 at 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 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 uses, 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 use of making punch, it would likewise serve much better in the state of alcohol; as the taste 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 it then bears a very near resemblance to arrac in flavour.

CHAPTER XX.

OF SUGAR SPIRIT.

We mean by a sugar spirit, that extracted from the washings, scummings, dross, and waste of a sugar-baker's refining-house.

These recrementitious 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.

CHAPTER 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 he 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 surprising 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 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 Mariæ* 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 cider. 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 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.

CHAPTER 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, till he has fixed his whole number of bottles, which serve as receivers to the juice distilling from the wounds. This operation is generally performed in the evening, a greater quantity of juice flowing from the tree in the night than in the day. The bottles are next morning taken off, and the liquor emptied with a proper vessel, where it spontaneously ferments. As soon as the fermentation is completed, the liquor is thrown into the still, and drawn down to a low-wine; but so very poor and dilute, that they are obliged to rectify it in another still, to that weak kind of proof spirit we generally see it; for though it appears bubble-proof, it rarely contains more than a sixth, and sometimes only an eighth of alcohol. All the rest being no more than an acidulated water, which might be supplied from any common spring. Why arrac appears bubble-proof, when in reality so far below what we mean by proof, is not so great a mystery as at first sight it appears to be; for this kind of proof is entirely owing to a certain tenacity of the parts of the liquor, or to the particular

property of the oil incorporated in the spirit; as we shall abundantly shew in a subsequent chapter.

From this account of arrac, it should seem no very difficult matter to imitate it here. And, perhaps, the whole difficulty lies in procuring a pure and insipid spirit; for it is ridiculous to attempt it with our common malt spirit. With regard to the flavour of the arrac, it may be effectually imitated by some essential oils easily procurable.

Hence we see of what prodigious advantage a pure and insipid spirit would be of to distillers, and consequently the great encouragement there is to attempt the discovery. Perhaps a spirit of this kind may be extracted from sugar properly refined. The hint is worth prosecuting; and the writer of this essay, from repeated experiments, is abundantly convinced that the thing is practicable. Had he entirely succeeded, he would readily have communicated the whole for the benefit of his country; but is now obliged to defer, to some future opportunity, the result of his inquiries. In the mean time, he would recommend the prosecution of this hint to those distillers who endeavour to improve their art, and to advance it nearer to perfection.

Since arrac is a spirit extracted from the juice of the cocoa tree, it may perhaps be worth inquiring how nearly it may be imitated by fermenting and distilling the juices of the birch and sycamore trees. We should by this means obtain an English arrac; and, perhaps, a spirit equal in flavour to that imported from Batavia.

When the cask in which the arrac is imported happens to be decayed, or the liquor touches any nails, or other iron, it dissolves part of it, and at the same time extracts the resinous parts of the oak, by which means the whole liquor in the cask acquires an inky colour. In order to whiten and clarify arrac which has contracted this colour, a large quantity of new or skimmed milk must be put into the cask, and the whole beat together, as vintners do to whiten their brown wines: by this means the inky colour will be absorbed by the milk, and fall with it to the bottom, so that the greatest part of the arrac may be drawn off fine; and the remainder procured in the same condition by being filtrated through a conical flannel bag.

CHAPTER XXIII.

OF RECTIFICATION.

THERE are several methods of performing this operation; though some, and indeed those in general practised by our distillers, hardly deserve the name; because, instead of rectifying, that is, freeing the spirit from its essential oil and phlegm, they alter the natural flavour of the spirit that comes over in the operation.

The principal business of rectification is to separate the spirit from the essential oil of the ingredient, which is very apt to adhere strongly to the spirit. And in order to this, care should be taken in the first distillation; that is, the spirit, especially that from malt, should be drawn by a gentle fire, by which means great part of the essential oil will be kept from mixing with the spirit; for experience has abundantly proved, that it is much easier to keep asunder, than to separate them when once mixed.

But as it is almost impossible to draw low-wines without the spirit being in some measure

impregnated with the essential oil, it is absolutely necessary to be acquainted with some methods of separating the spirit from the oil, and also of freeing it from its phlegm. The best methods of doing this to perfection, are redistillation and percolation.

In order to rectify low-wines, they should be put into a tall body or alembic, and gently distilled in *Balneum Mariæ;* by this means a large proportion both of the oil and phlegm will remain in the body. But if the spirit should be found, after this operation, to contain some of the essential oil, it must be let down with fair water, and redistilled in the same gentle manner. And thus it may be brought to any degree of purity; especially if, in the working, the spirit be suffered to fall into a proper quantity of *Balneum Mariæ.* But it must be remembered, that it is much more difficult to cleanse alcohol, or proof spirit, than low-wines, because the oil is more intimately mixed with the two former than with the latter. This oil may, however, be separated from proof spirit, &c. by the method already proposed, especially if it be previously filtrated through paper, thick flannel, sand, stone, &c.

But this method, though it effectually answers

the intention, is generally rejected by our distillers, because of the slowness of the operation, and others substituted in its stead; though, instead of freeing the spirit from the oil, they only abolish the natural flavour of the spirit, and make a more intimate mixture between the particles of the spirit and those of the essential oil.

It is impossible to enumerate all the methods practised by distillers, as almost every one pretends to have a secret nostrum for this purpose. The principal methods in use for rectifying malt spirits are however reducible to three; namely, by fixed alkaline salts, by acid spirits mixed with alkaline salts, and by saline bodies, and flavouring additions.

The method of rectifying by alkaline salts is thus performed. To every piece of proof spirit, add fourteen pounds of dry salt of tartar, fixed nitre, or calcined tartar; lute on the head, and distil by a gentle heat, but be very careful to leave out the faints. By this method a large proportion of the fetid oil will be left in the still; and what comes over with the spirit will be greatly attenuated. But this operation is generally performed in a very different manner; for, instead of distilling the spirit in a gentle and

equable manner, the still is worked in its full force; by which means the oil, which should have remained in the still, is driven over, and intimately mixed with the spirit; and consequently, the whole operation frustrated, and the spirit rendered much harder to cleanse than it was before.

But even when the operation is performed according to the rules of art, it is far from being perfect; for it is well known, that part of the fixed salts become volatile in the operation, pass over the helm, and intimately mix with the essential oil still contained in the spirits: by this means the oil becomes more perfectly united with the spirits, and consequently much harder to be separated by repeated distillations. Nor is this all, for the still being worked in its full force, the bitter oil of the malt, formed into a kind of liquid soap in the still by means of the alkaline salt, is brought over the helm with the faints, and suffered to mix with the spirit, whereby it is rendered almost as nauseous and ill tasted as before the operation. Besides, if this operation were performed in its utmost perfection, it would never answer the intention; for the alkaline salt destroys the vinosity of the spirit; and consequently deprives it of one of its most valuable properties. Our distillers are well acquainted with

this defect in the operation, and endeavour to supply it by an addition of acids. This is what we call the second method, by alkalies and acids.

The operation of rectifying by the method of fixed alkalies and acids, is the same as that above described: the spirit is drawn over from fixed alkalies as before; but in order to mortify the alkali in the spirit, and restore its vinosity, a proper quantity of some acid spirit is added. Various kinds of acids are used on this occasion; but principally those of the mineral kind, because of their cheapness; as oil of vitriol, spirit of nitre, oil of sulphur, and the like. We would, however, caution a young distiller from being too busy with these corrosive acids; the sulphurous spirit of vitriol, dulcified spirit of nitre, or Mr Boyle's acid spirit of wine well rectified, will much better answer his purpose.

The third method of rectification is that by saline bodies, and flavouring ingredients. There is no difference in the operation between this and the two foregoing methods: fixed alkaline salts, common salt decrepitated or dried, calcined vitriol, sandiver, alum, &c. is put into the still with the low-wines, and the spirit drawn over as before. When the quantity is drawn off,

the flavouring ingredients are added to give the spirit the flavour intended. But as the spirit is not by this means rendered sufficiently pure, the disagreeable flavour of the spirit generally overpowers that of the ingredients, whereby the whole intention is either destroyed, or a compound flavour produced, very different from that intended.

Some distillers, instead of alkaline salts, use quicklime in rectifying their malt spirit: this ingredient cleanses and dephlegmates the spirit considerably; but like that rectified from alkaline salts, it acquires an alkaline disposition, and also a nidorous flavour. Acids, therefore, are as necessary to be mixed with those spirits rectified with quicklime, as with those rectified with an alkaline salt. If chalk, calcined and well purified animal bones, &c. were used instead of quicklime, the spirit would have a much less alkaline or nidorous flavour; and, consequently, the flavouring ingredients might be added to it with more success than can be expected from a spirit rectified from alkaline salts.

But, perhaps, if neutral salts were used instead of the alkaline ones, the spirit might be rendered pure, without contracting an alkaline flavour: soluble tartar might be used for this purpose,

though the spirit acquires from hence a little saponaceous flavour. Dr Cox has mentioned another method for this purpose, namely, to deprive the volatile salts of their oil, by rendering them neutral with spirit of salt, and afterwards subliming them with salt of tartar; the acid may be varied if the spirit of salt should not be found so well adapted to the purpose as could be wished: but fine dry sugar seems the best adapted to the purpose of rectifying these spirits; as it readily unites with the essential oil, detains and fixes it, without imparting any urinous, alkaline, or other nauseous flavour to the spirits rectified upon it.

Thus have I considered the principal methods used by our distillers in rectifying their spirits; and shall conclude this chapter with remarking, that there is no other way of rectifying to perfection, besides what we first laid down, namely, by gentle distillation. But then it must be remembered, that the whole process must be of a piece: we mean, that the first distillation from the wash must be performed in a gentle manner; for otherwise the essential oil will be so intimately blended with the spirit, as not to be easily separated by redistillation. Another good property attending this method is its universality: all kinds of spirits, from whatever ingredients

extracted, require rectification; and this is adapted to all kinds.

CHAPTER XXIV.

OF THE FLAVOURING OF SPIRITS.

We have observed in the preceding chapter, that the common method of rectifying spirits from alkaline salts, destroys their vinosity, and, in its stead, introduces an urinous or lixivious taste. But as it is absolutely necessary to restore, or at least to substitute in its room, some degree of vinosity, several methods have been proposed, and a multitude of experiments performed, in order to discover this great *desideratum:* but none has succeeded equal to the spirit of nitre; and accordingly this spirit, either strong or dulcified, has been used by most distillers, to give an agreeable vinosity to their spirits.

Several difficulties, however, occur in the method of using it; the principal of which is, its being apt to quit the liquor in a short time, and consequently depriving the liquor of that vinosity it was intended to give. In order to remove this difficulty, and prevent the vinosity from

quitting the goods, the dulcified spirit of nitre, which is much better than the strong spirit, should be prepared by a previous digestion, continued for some time, with alcohol; the longer the digestion is continued, the more intimately will they be blended, and the compound rendered the milder and softer.

After a proper digestion, the dulcified spirit should be mixed with the brandy, by which means the vinosity will be intimately blended with the goods, and disposed not to fly off for a very considerable time.

No general rule can be given for the quantity of this mineral acid requisite to be employed, because different proportions of it are necessary in different spirits. It should, however, be carefully adverted to, that though a small quantity of it will undoubtedly give an agreeable vinosity, resembling that naturally found in the fine subtile spirits drawn from wines, yet an over large dose of it will not only cause a disagreeable flavour, but also render the whole design abortive, by discovering the imposition. Those, therefore, who endeavour to cover a foul taste in goods by large doses of dulcified spirit of nitre, will find themselves deceived.

But the best, and indeed the only method of imitating French brandies to perfection, is by an essential oil of wine; this being the very thing that gives the French brandies their flavour. It must, however, be remembered, that in order to use even this ingredient to advantage, a pure tasteless spirit must be first procured; for it is ridiculous to expect, that this essential oil should be able to give the agreeable flavour of French brandies to our fulsome malt spirit, already loaded with its own nauseous oil, or strongly impregnated with a lixivious taste from the alkaline salts used in rectification. How a pure insipid spirit may be obtained, has been already considered in some of the preceding chapters; it only therefore remains to shew the method of procuring this essential oil of wine, which is this:—

Take some cakes of dry wine lees, such as are used by our hatters, dissolve them in six or eight times their weight of water, distil the liquor with a slow fire, and separate the oil by the separating glass; reserving for the nicest uses that only which comes over first, the succeeding oil being coarser and more resinous.

Having procured this fine oil of wine, it may be mixed into a quintessence with pure alcohol;

by which means it may be preserved a long time fully possessed of all its flavour and virtues; but without such management, it will soon grow resinous and rancid.

When a fine essential oil of wine is thus procured, and also a pure and insipid spirit, French brandies may be imitated to perfection with regard to the flavour. It must, however, be remembered, and carefully adverted to, that the essential oil be drawn from the same sort of lees as the brandy to be imitated was procured from: we mean, in order to imitate Cogniac brandy, it will be necessary to distil the essential oil from Cogniac lees; and the same for any other kind of brandy. For as different brandies have different flavours, and as these flavours are owing entirely to the essential oil of the grape, it would be preposterous to endeavour to imitate the flavour of Cogniac brandy, with an essential oil procured from the lees of Bourdeaux wine.

When the flavour of the brandy is well imitated by a proper dose of the essential oil, and the whole reduced into one simple and homogeneous fluid, other difficulties are still behind: the flavour, though the essential part, is not, however, the only one; the colour, the proof, and the soft-

ness, must be also regarded, before a spirit that perfectly resembles brandy can be procured.—With regard to the proof, it may be easily hit, by using a spirit rectified above proof; which, after being intimately mixed with the essential oil of wine, may be let down to a proper standard by fair water. And the softness may in a great measure be obtained by distilling and rectifying the spirit with a gentle fire; and what is wanting of this criterion in the liquor, when first made, will be supplied by time; for it must be remembered, that it is time alone that gives this property to French brandies; they being at first like our spirits, acrid, foul, and fiery. But with regard to the colour, a particular method is necessary to imitate it to perfection: and how this may be done shall be considered in the next chapter.

CHAPTER XXV.

OF THE METHODS OF COLOURING SPIRITS.

The art of colouring spirits owes its rise to observations on foreign brandies. A piece of French brandy that has acquired by age a great degree of softness and ripeness, is observed at the same time to have acquired a yellowish-brown

colour; and hence our distillers have endeavoured to imitate this colour in such spirits as are intended to pass for French brandy. And in order to this a great variety of experiments have been made on various substances, in order to discover a direct and sure method of imitating this colour to perfection. But, in order to do this, it is necessary to know from whence the French brandies themselves acquire their colour; for till we have made this discovery, it will be in vain to attempt an imitation; because, if we should be able to imitate exactly the colour, which is indeed no difficult task, the spirit will not stand the test of different experiments, unless the colour in both be produced from the same ingredient.

This being undeniably the case, let us try if we cannot discover this mighty secret—the ingredient from whence the French brandy acquires its colour.

We have already observed, that this colour is only found in such brandies as have acquired a mellow ripeness by age; it is therefore not given it by the distiller, but has gained it by lying long in the cask. Consequently, the ingredient from whence this colour is extracted, is no other than the wood of the cask, and the brandy in reality is become a dilute tincture of oak.

The common experiment used to prove the genuineness of French brandy, proves that this opinion is well founded. The experiment is this: they pour into a glass of brandy a few drops of a solution of calcined vitriol of iron, in a diluted spirit of sulphur, or any other mineral acid, and the whole turns of a blue colour; in the same manner as we make ink of a tincture of galls and vitriol.

Since, therefore, the colour of French brandies is acquired from the oak of the cask, it is no difficulty to imitate it to perfection. A small quantity of the extract of oak, or the shavings of that wood properly digested, will furnish us with a tincture capable of giving the spirit any degree of colour required. But it must be remembered, that as the tincture is extracted from the cask by brandy, that is, alcohol and water, it is necessary to use both in extracting the tincture; for each of these menstruums dissolves different parts of the wood. Let, therefore, a sufficient quantity of oak shavings be digested in strong spirit of wine, and also at the same time other oak shavings be digested in water; and when the liquors have acquired a strong tincture from the oak, let both be poured off from the shavings, into different vessels, and both placed over a gentle fire till reduced to the consistence of treacle: In this condition,

let the two extracts be intimately mixed together; which may be done effectually by adding a small quantity of loaf sugar, in fine powder, and well rubbing the whole together. By this means a liquid essential extract of oak will be procured, and always ready to be used as occasion shall require.

There are other methods in use for colouring brandies; but the best, besides the extract of oak above-mentioned, are common treacle and burnt sugar.

The treacle gives the spirits a fine colour, nearly resembling that of French brandy; but as its colour is but dilute, a large quantity must be used: this is not however attended with any bad consequences; for notwithstanding the spirit is really weakened by this addition, yet the bubble proof, the general criterion of spirits, is greatly mended by the tenacity imparted to the liquor by the treacle. The spirit also acquires from this mixture a sweetish or luscious taste, and a fulness in the mouth; both which properties render it very agreeable to the palates of those who are the principal consumers of these spirits.

A much smaller quantity of burnt sugar than of treacle will be sufficient for colouring the same quantity of spirits: the taste is also very different;

for instead of the sweetness imparted by the treacle, the spirit acquires from the burnt sugar an agreeable bitterness, and by that means recommends itself to nicer palates, which are offended with a luscious spirit. The burnt sugar is prepared by dissolving a proper quantity of sugar in a little water, and scorching it over the fire till it acquires a black colour.

Either of the above ingredients, treacle or burnt sugar, will nearly imitate the genuine colour of old French brandy; but neither of them will succeed, when put to the test of the vitriolic solution.

Thus have I traced the subject of distillation from its origin; shewn the methods commonly made use of by distillers; and pointed out various improvements that might be introduced into this art with great advantage; and shall conclude this part with recommending the several hints to those distillers who are desirous of improving their art, and proceeding on a rational foundation, it being from such only that improvements are to be expected; for where the operations are constantly carried on in the same beaten track, it is in vain to expect improvements, unless chance should be kind enough to throw that in their way, which a rational theory would have easily led them to discover.

PART II.

CONTAINING THE METHOD OF DISTILLING SIMPLE WATERS.

CHAPTER I.

THE instruments chiefly used in the distillation of simple waters are of two kinds, commonly called the hot still, or alembic, and the cold still; the former is represented in *Fig.* 5. and the latter in *Fig.* 10.

The waters drawn by the cold still from odoriferous plants, are much more fragrant, and more fully impregnated with their virtues, than those drawn by the hot still or alembic: but the operation is much more slow and tedious by the former than the latter, so that very few care to comply with it; and therefore a method has been invented to avoid the tediousness of the one, and the inconveniencies of the other. The method is this:

A pewter body is suspended in the body of the alembic, and the head of the still fitted to the pewter body; into this body the ingredients to be

distilled are put, the alembic filled with water, the still-head luted to the pewter body, and the nose luted into the worm of the refrigeratory or worm.

The same intention will be answered, by putting the ingredients into a glass alembic, and placing it in a bath heat, or *Balneum Mariæ*, as we have before directed, Chap. XI.

By either of these means, the ingredients have greater heat given them than in the cold still; and yet, by the interposition of the water in which the vessel containing them is placed, they are not so forcibly acted upon by the fire, as in the common way of the hot still. So that all those things which require a middle way between the other; that is, those simples which are of a texture between very volatile and very fixed, are treated very properly by this method; but neither the very odoriferous simples, nor those whose parts are very heavy and fixed, can be treated this way but to disadvantage.

One of the greatest advantages of this contrivance is, that waters so drawn come over much cooler than from the hot still; that is, they have not so much of the fire in them, as the distillers term it; so that a hot spicy water, thus ordered,

will taste as cool on the palate when just drawn, as it would when drawn by the hot still after it had acquired a considerable age.

CHAPTER II.

OF WATERS DRAWN BY THE COLD STILL.

THE cold still is much the best adapted to draw off the virtues of simples, which are valued for their fine flavour when green, which is subject to be lost in drying. For when we want to extract from plants a spirit so light and volatile, as not to subsist in open air any longer than while the plant continues in its growth, it is certainly the best method to remove the plant from its native soil, into some proper instrument, where, as it dries, these volatile parts can be collected and preserved. And such an instrument is what we call the cold still, where the drying of the plant or flower is only forwarded by a moderate warmth, and all that rises is collected and preserved.

As the method of performing the operation by the cold still is the very same, whatever plant or flower is used, the following instance of procuring

a water from rosemary, will be abundantly sufficient to instruct the young practitioner in the manner of conducting the process in all cases whatever.

Take rosemary, fresh gathered, in its perfection, with the morning dew upon it, and lay it lightly and unbruised upon the plate, or bottom of the still. Cover the plate with its conical head, and apply a glass receiver to the nose of it. Make a small fire of charcoal under the plate, continuing it as long as any liquor comes over into the receiver. When nothing more comes over, take off the still-head, and remove the plant, putting fresh in its stead, and proceed as before: continue to repeat the operation successively, till a sufficient quantity of water is procured. Let this distilled water be kept at rest, in clean bottles close stopped, for some days in a cold place; by this means it will become limpid, and powerfully impregnated with the taste and smell of the plant.

In this water are contained the liquor of dew, consisting of its own proper parts, which are not without difficulty separated from the plant, and cleave to it even in the drying. This dew, also, by sticking to the outside, receives the liquid parts of the plant, which being elaborated the day before,

and exhaled in the night, are hereby detained, so that they concrete together into one external liquid, which is often viscid, as appears in manna, honey, &c. This water also contains the fluid which exhales from the vessels of the rosemary, and which principally consists of simple water, as appears upon long standing in an open vessel, when the taste and odour vanishing, leave an insipid water behind. Another part of this water is that subtile volatile substance, which gives the plant its peculiar taste and odour; for this the senses discover in it; but what remains after the process is finished, scarce afford any thing thereof. The same water seems also to contain seeds, or other little bodies; which in a certain time usually grows into a kind of thin, whitish weed, suspended in the middle of the water; and daily increasing or spreading itself, becomes a mucilage, which did not appear at first.

I have kept these waters undisturbed in separate well closed vessels, and observed, that in a year's time they began to appear thick, which thickness gradually increased every year, till at length the liquor grew ropy and mucilaginous. Hence we see, that this water contains the elementary water, and presiding spirit of the plant; a spirit small in bulk, but rich in virtues, and

exhibiting the specific smell and taste of the subject. This water, therefore, in exhaling, proves a vehicle to that spirit, which contains in a small, subtile, extremely volatile, and thence easily separable substance, the particular virtue of the plant, leaving the remainder exhausted in this respect: and hence proceeds the medicinal virtues of these waters, which principally depend upon their native spirit. For this spirit, in most plants, having a brisk mobility, affects the nerves, and raises the spirits in case of their depression.

If the vessel be close stopped, and set in a cool place, the waters drawn by the cold still will retain their virtues for a year; but if negligently kept, or any crack should happen in the glass, their extremely volatile spirit secretly flies off, and leaves the water vapid.

Hence we learn what it is that plants lose by being dried in the summer time; namely, the water and spirit we have been describing. Hence we also know the nature of that fluid, which first rises from plants in distillation, and what that matter properly is in plants, that gives their peculiar odour; that is, their presiding spirit. Lastly, we hence learn, in some measure at least, what those *effluvia* are, which principally

in the summer season, and in the open air, exhale from vegetables; for it is highly probable, that these constant exhalations of plants, especially in the day-time, have a near agreement in their peculiar nature with the liquor extracted by the cold still; though differing in this, that the exhalation made from the parts is continually recruited by the root; whilst, by our operation, those parts alone are collected, which are driven off from the plant after being gathered, and no longer supplied with fresh nourishment.

CHAPTER III.

OF THE DISTILLING SIMPLE WATERS BY THE ALEMBIC.

The plants designed for this operation are to be gathered when their leaves are at full growth, and a little before the flowers appear, or, at least, before the seed comes on; because the virtue of the simple expected in these waters is often little, after the seed or fruit is formed, at which time plants begin to languish: the morning is best to gather them in, because the volatile parts are then condensed by the coldness of the night, and kept in by the tenacity of the dew, not yet exhaled by the sun.

This is to be understood, when the virtue of the distilled water resides principally in the leaves of plants; as it does in mint, marjorum, penny-royal, rue, and many more; but the case differs when the aromatic virtue is only found in the flowers, as in roses, lilies of the valley, &c. in which case we choose their flowery parts, whilst they smell the sweetest, and gather them before they are quite opened, or begin to shed, the morning dew still hanging on them.

In other plants the seeds are to be preferred, as in anise, caraway, cumin, &c. where the herb and the flower are indolent, and the whole resides in the seed alone, where it manifests itself by its remarkable fragrance, and aromatic taste. We find that seeds are more fully possessed of this virtue, when they arrive at perfect maturity.

We must not omit, that these desirable properties are found only in the roots of certain plants, as appears in avens and in orpine, whose roots smell like a rose. Roots of this kind should be gathered, for the present purpose, at that time when they are richest in these virtues; which is generally at that season of the year just before they begin to sprout, when they are to be dug up in a morning.

If the virtues here required be contained in the barks or woods of vegetables, then these parts must be chosen for the purpose.

The subject being chosen, let it be bruised, or cut, if there be occasion, and with it fill two-thirds of a still, leaving a third part of it empty, without squeezing the matter close; then pour as much rain or river water into the still as will fill it to the same height; that is, two-thirds together with the plant: fit on the head, luting the juncture, so that no vapour may pass through; and also lute the nose of the still-head to the worm. Apply a receiver to the bottom of the worm, that no vapour may fly off in the distillation; but that all the vapour being condensed in the worm by cold water in the worm-tub, may be collected in the receiver.

Let the plant remain thus in the still to digest for twenty-four hours, with a small degree of heat. Afterwards raise the fire, so as to make the water in the still boil; which may be known by a certain hissing noise proceeding from the breaking bubbles of the boiling matter; as also by the pipe of the still-head, or the upper end of the worm, becoming too hot to be handled; or the smoking of the water in the worm-tub heated by the

top of the worm; and, lastly, by the following of one drop immediately after another, from the nose of the worm, so as to form an almost continual stream. By all these signs we know that the requisite heat is given: if it be less than a gentle ebullition, the virtues of the simple, here expected, will not be raised; on the contrary, when the fire is too strong, the water hastily rises into the still-head, and fouls both the worm and the distilled liquor; and the plant being also raised, it blocks up the worm: for which reason, it is no bad caution to fasten a piece of fine linen before the pipe of the still-head, that, in case of this accident, the plant may be kept from stopping up the worm; but, notwithstanding this precaution, if the fire be too fierce, the plant will stop up the pipe of the still-head, and consequently the rising vapour finding no passage, will blow off the still-head, and throw the boiling liquor about the still-house, so as to do a great deal of mischief, and even suffocate the operator, without a proper caution; and the more oily, tenacious, gummy, or resinous the subject is, the greater the danger in case of this accident, because the liquor is the more frothy and explosive.

Let the due degree of fire therefore be carefully observed, and equally kept up, as long as

the water distilling into the receiver is white, thick, odorous, sapid, frothy, and turbid; for this water must be carefully kept separate from that which follows it. The receiver therefore should be often changed, that the operator may be certain that nothing but this first water comes over; for there afterwards arises a water that is transparent, thin, and without the peculiar taste and flavour of the plant, but generally somewhat tartarish and limpid, though somewhat obscured and fouled by white dreggy matter; and if the head of the still be of copper, and not tinned, the acidity of this last water corrodes the copper, so as to become green, nauseous, emetic, and poisonous to those who use it, especially to children, and persons of weak constitutions.

The first water above described principally contains the oil and presiding spirit of the plant; for the fire, by boiling the subject, dissolves its oil, and reduces it into small particles, which are carried upwards by the assistance of the water, along with those parts of the plant that become volatile with their motion. And, if the vessels are exactly closed, all these being united together will be discharged without loss, and without much alteration, into the receiver; and, consequently, furnish us with a water richly impreg-

nated with the smell, taste, and particular virtues of the volatile parts of the plants it was extracted from.

The water of the second running wants the volatile part above described, and has scarce any other virtue than that of cooling.

And this is the best method of preparing simple waters, provided the two sorts be not mixed together, for both of them would be spoiled by such a mixture.

Hence it plainly appears, at what time, with the same degree of fire, quite contrary virtues may arise from a plant; for so long as a milky water continues to come over from such plants as are aromatic, so long the water remains warming and attenuating; but when it comes to be thin and pellucid, it is acid and cooling.

Hence we may also learn the true foundation for conducting of distillation: for if the operation be stopped as soon as ever the white water ceases to come over, the preparation will be valuable and perfect; but if, through a desire of increasing that quantity, more be drawn off, and the latter acid part suffered to mix with the first

running, the whole will be spoiled, or at least rendered greatly inferior to what it would otherwise have been.

Such is the general method of procuring simple waters, that shall contain the volatile virtues of the plants distilled: some rules are however necessary to render it applicable to all sorts of plants; these rules are the following:

1. Let the aromatic, balsamic, oily, and strong-smelling plants, which long retain their natural fragrance, such as balm, hyssop, juniper, marjorum, mint, origanum, pennyroyal, rosemary, lavender, sage, &c. be gently dried a little in the shade; then digest them, in the same manner as already mentioned, for twenty-four hours, in a close vessel, with a small degree of heat, and afterwards distil in the manner above delivered, and thus they will afford excellent waters.

2. When waters are to be drawn from barks, seeds, or woods that are very dense, ponderous, tough and resinous, let them be digested for three, four, or more weeks, with a greater degree of heat, in a close vessel, with a proper quantity of salt added, to open and prepare them the better for distillation. The quantity of sea-salt

is here added, partly to open the subject the more, but chiefly to prevent putrefaction, which otherwise would certainly happen in so long a time, and with such a heat as is necessary in this case, and so destroy the smell, taste, and virtues expected from the process.

3. Those plants which diffuse their odour to some distance from them, and thus soon lose it, should immediately be distilled after being gathered in a proper season, without any previous digestion: thus borage, bugloss, jessamine, white lilies, lilies of the valley, roses, &c. are hurt by heat, digestion, or lying in the air.

CHAPTER IV.

OF INCREASING THE VIRTUES OF SIMPLE WATERS BY MEANS OF COHOBATION.

By cohobation is meant the returning the distilled water, procured in the manner described in the preceding chapter, upon more of the fresh plant. The operation is performed in the following manner:—

Take the plant and liquor remaining in the

still after the operation described in the foregoing chapter is performed, and press them strongly in a bag for that purpose, that all the decoction may be obtained; and with this mix all the water before drawn over. Return this mixture into the still, and a fresh quantity of the same plant, and, if necessary, as much water as will make the former proportion to the plant. Close all the junctures exactly, and digest the whole in a gentle degree of heat for three days and three nights, that the herb, being so long steeped in its own liquor, may be opened, loosened, and disposed the easier to part with its virtues. This digestion is of great service; but if protracted too long, introduces a change tending to putrefaction. Let the water now be distilled off, in the same manner as before; only proceeding more cautiously, and somewhat more slowly at first; because the liquor in the still being now thicker, more impregnated with the plant, and therefore more apt to swell upon feeling the fire, it easily boils over; but after about half of the expected water is come off, the fire may be gradually raised.

By this method, and carefully observing to change the receiver as soon as the first water is all come over, a noble liquor, highly impregnated with the virtues of the plant, will be

obtained. And as this operation may be repeated as often as desired, the virtues of plants may be thus exalted to any degree the artist shall think proper; which shews the extraordinary power of distillation. This method I would particularly recommend for making the simple water of balm, elder-flowers, roses, and the like simples, but sparingly furnished with an essential oil.

CHAPTER V.

OF THE METHOD OF PROCURING A SIMPLE WATER FROM VEGETABLES, BY PREVIOUSLY FERMENTING THE VEGETABLE BEFORE DISTILLATION.

By this elegant method we obtain the virtues of plants very little altered from what they naturally are, though rendered much more penetrating and volatile. The operation is performed in the following manner:—

Take a sufficient quantity of any recent plant, cut it, and bruise it if necessary; put it into a cask, leaving a space empty at top of about four inches deep; then take as much water as would, when added, fill the cask to the same height, in-

cluding the plant, and mix therein about an eighth part of honey, if it be cold winter weather; or a twelfth part, if it be warm: in the summer, the like quantity of coarse unrefined sugar might be added instead of honey, or half an ounce of yeast to each pint of water will have the same effect; though most prefer honey for this purpose. When the proper quantity of honey is added to the water, let it be warmed and poured into the cask, and set it in a warm place to ferment for two or three days; but the herbs must not be suffered to fall to the bottom, nor the fermentation above half finished. The whole must then be immediately committed to the still, and the fire raised by degrees; for the liquor containing much fermenting spirit, easily rarefies with the fire, froths, swells, and therefore becomes very subject to boil over; we ought therefore to work slower, especially at first.

By this method there will come over, at first, a limpid, unctuous, penetrating, odorous, sapid liquor, which is to be kept separate: after this there follows a milky, opaque, turbid liquor, still containing something of the same taste and odour; and at length comes one that is thin, acid, without either smell, or scarce any property of the plant.

The first water, or rather spirit, may be kept several years, in a close vessel, without changing or growing ropy. It also excellently retains the taste and odour of the plant, though a little altered; but if less honey were added, less heat employed, or the fermentation continued for a smaller time, the distilled liquor of the first running would be white, thick, opaque, unctuous, frothy, and perfectly retain the scent and taste of the plant, or much less altered than in the former case, though the water will not be so sharp and penetrating. After this is drawn off, a tartish, limpid, inodorous liquor will come over.

And thus may simple waters be made fit for long keeping without spoiling; the proportion of inflammable spirit generated in the fermentation, serving excellently to preserve them.

CHAPTER VI.

OF THE SIMPLE WATERS COMMONLY IN USE.

Simple waters are not so much used at present as they were formerly; and perhaps one reason for their being neglected, is the bad methods used in distilling them: the process is

carried on in the same manner with every herb; though some should be gently dried, and others distilled green; some should be drawn with the cold, and others with the hot still.

The general rule that should be observed with regard to the hot still is, that all herbs should have twice their weight of water added to them in the still; and not above a fourth or a sixth part of it drawn off again; for simple waters have their faints, if drawn too low, as well as those that are spirituous.

Some plants, particularly balm, require to have the water drawn from them cohobated, or poured several times on a fresh parcel of the herb, in order to give it a proper degree of strength or richness. Others, on the contrary, abound too much with an essential oil that floats on the distilled water; in this case, all the oil should be carefully taken off. Lastly, those that contain a more fixed oil, should be imperfectly fermented, in the manner laid down in the preceding chapter, before they are distilled; of this kind are carduos, camomile, &c.

The simple waters now commonly made, are orange-flower water, rose water, cinnamon water,

fennel water, peppermint water, spearmint water, balm water, pennyroyal water, Jamaica pepper water, castor water, simple water of orange-peel, and of dill-seed.

CHAPTER VII.

OF ORANGE-FLOWER WATER.

THE orange-tree grows plentifully in Italy, Spain, and Portugal, and bears flowers and fruit all the year; but the fruit is gathered chiefly in October and November.

The flowers grow on the younger shoots among the leaves; they are white, and consist of a single cup-fashioned leaf, cut into five parts, with several yellow stamina in the middle, and of a fragrant odoriferous smell.

Some degree of attention is requisite to draw a simple and odoriferous water from the orange-flowers: the fire must be carefully regulated; for too small a degree will not bring over the essential oil of the flowers, in which their odoriferous flavour consists; and, on the contrary, too strong a fire destroys the fragrancy of the water, and is

very apt to scorch the flowers, and give the water an empyreumatic smell. Care should also be taken to fasten the receiver to the end of the worm with a bladder, to prevent the volatile parts from evaporating.

The quantity of water, also, should be carefully attended to, if you hope to succeed in the operation. The following receipts will answer the intention:—

RECEIPTS FOR ORANGE-FLOWER WATER.

Take twelve pounds of orange-flowers, and twenty-four quarts of water, and draw over three pints. Or,

Take twelve pounds of orange-flowers, and sixteen quarts of water; draw over fifteen quarts, carefully attending to what has been observed at the beginning of the chapter with regard to the regulation of the fire.

THE MANNER OF MAKING DOUBLE ORANGE-FLOWER WATER, AND THE ESSENTIAL OIL, OR QUINTESSENCE OF ORANGE-FLOWERS.

Having shewn how to make simple orange-

flower water, we shall now shew how to make double orange-flower water, and the essential oil or quintessence of orange-flowers.

Double orange-flower water is made by distilling the orange-flowers in a cold still, in the manner laid down in the first chapter. The water extracted in this manner will be very odoriferous and grateful, being what is called double orange-flower water. The same odoriferous water will be obtained by distilling the flowers in *Balneum Mariæ* without any water in the still. If the cold still be used, put into it as many flowers as the head will well cover; and then make a gentle fire under the plate; and as soon as you perceive the still is beginning to work, fasten the receiver to the beak of the still with a bladder. The same caution must be observed if the flowers are distilled in *Balneum Mariæ*.

To make this water to perfection, the flowers should be fresh gathered in the morning with the dew upon them, if possible; and carefully picked from the leaves. You should likewise make choice of the largest flowers, because these yield most in distillation. The fire must be brisk when the flowers are distilled in *Balneum Mariæ;* because the operation is longer in performing than

by the common alembic, and the flowers are not here in danger of being burnt at the bottom of the cucurbit. If you would have your water of a fine smell, let it be cohobated on fresh flowers.

With this double water, the essential oil or quintessence will come over, and float on the surface of the water. But a much larger quantity of it will be obtained by cohobating the water on fresh flowers in *Balneum Mariæ*. The essential oil is at first of a green colour, but after some days it will turn reddish. The essential oil is easily separated from the water, by the separating glass, in the following manner: stop the spout of the separating glass with a cork, and then fill it with the orange-flower water; when it has stood a small time, the oil will float on the surface. Then pull out the cork and let the water run out at the spout into another receiver placed for that purpose. As the water runs out at the spout of the separating glass, let it be supplied at the mouth, that the separating glass may be always full of water, till the whole is in this manner poured into it. Then, by gently inclining the glass, pour out all the water in it through the spout, and the oil will remain in the separating glass, and may be poured into another bottle, and kept separate from the water. The double orange-

flower water is odoriferous; but the essential oil much more so.

Orange-flower water is not at present so much used as formerly; but as it is a very odoriferous water, I thought the method of making it would not be unacceptable to the young distiller.

The essential oil, or quintessence of orange-flowers, will make a very grateful cordial, by mixing it with a clean proof spirit. The method of mixing it is this:—

Take some fine loaf-sugar, and drop on it the quantity of oil you intend to dissolve in the spirit, and rub them well together in a glass mortar, which is what the chemists call making an oleosaccharum. Put this oleosaccharum into the spirit; mix them well together, and dulcify it with sugar to your taste. If the spirit be too strong, it may be lowered with water; but you must observe, that if you add water enough to bring the spirit considerably below proof, it will turn milky; and in order to render it fine, you must filtrate it through thick flannel, or thin paper. Twenty drops of the essential oil will be sufficient for a pint of spirit, and the same proportion to a larger quantity.

CHAPTER VIII.

OF ROSE WATER.

THE damask rose is the species intended to be used in this operation; it is of a very fragrant smell, and flowers in June and July. The water may be made either by the hot still, the cold still, or the *Balneum Mariæ*. If the hot still be used, the leaves picked from the stalks must be put into the still with a sufficient quantity of water to prevent an empyreuma, and the water drawn off by a gentle fire. The receiver must be luted with a bladder to the nose of the worm, to prevent the finest and most volatile parts from evaporating, which they would otherwise do, to the great prejudice of the water.

If the cold still be used, the rose leaves, either with the dew on them, or sprinkled with water, must be laid on the iron plate, and covered with the conical head. A gentle fire must then be made under the plate, and a receiver luted with a bladder to the nose of the still. The water will gradually distil into the receiver, and be strongly impregnated with the odoriferous parts of the roses.

The same method, with regard to the *Balneum Mariæ*, must be used in the distillation of roses as in that of orange-flowers, and therefore need not be repeated here. We shall therefore only observe, that rose water, drawn either by the cold still or the *Balneum Mariæ*, is much preferable to that drawn by the hot still.

The essence, or essential oil of roses, is looked upon as one of the most valuable perfumes in the world; but at the same time the most difficult to be procured in any quantity. A small quantity of it is made in Italy, but it has always been thought impossible to procure it here; and, therefore, a method of acquiring this valuable commodity will not, I presume, be disagreeable to the reader.

Take a quantity of damask rose leaves, put them into a proper vessel, with a sufficient quantity of water, adding some mineral acid, as spirit of salt, vitriol, &c. In this menstruum let the roses be digested for fifteen days; after which put the whole into an alembic, and draw off the water with a pretty brisk fire. But, instead of the common receiver, a separating glass must be placed under the nose of the worm, and a receiver added to the tube of the separating glass.

By this means all the oil or essence will float on the surface of the water in the separating glass, and may easily be separated from it, when the operation is finished.

CHAPTER IX.

OF CINNAMON WATER.

CINNAMON is a thin fine bark, rolled up in a sort of little pipes, from the thickness of a goose-quill to that of a man's thumb, and sometimes more, and about two or three feet long. Its colour brownish, with a mixture of red. It is of an extremely aromatic smell, and of an acrid and pungent, but very agreeable taste. It is the interior or second bark of a tree that grows plentifully in Ceylon. The people who gather it take off the two barks together, and immediately separating the outer one, which is rough, and has very little fragrancy, they lay the other to dry in the shade in an airy place, where it rolls itself up into the form wherein we see it.

The greatest cheats in the sale of cinnamon, are the selling such as has already had its essential oil distilled from it, and dried again, and the

imposing cassia lignea in its place. The first of these is discovered by the want of pungency in the cinnamon; the second by this, that the cassia, when held a little time in the mouth, becomes mucilaginous, which the true cinnamon never does. Cinnamon is a noble drug, endued with many capital virtues; it strengthens the viscera, assists concoction, dispels flatulencies, and is a pleasant cardiac.

RECEIPT FOR ONE GALLON OF SIMPLE CINNAMON WATER.

Take a pound of the best cinnamon grossly powdered; digest for twenty-four hours in two gallons of water; put the whole into an alembic, and draw over one gallon with a pretty brisk fire.

The oil of cinnamon, in which the specific virtue of the drug consists, is very ponderous, and therefore will not come over the helm unless the fire be pretty brisk, especially with a simple water. It will therefore be in vain to attempt distilling simple cinnamon water by the *Balneum Mariæ.*

CHAPTER X.

OF FENNEL WATER.

FENNEL WATER is extracted from a seed larger and more beautiful than that produced by our common fennel; it is called *Sweet Fennel-seed*, being of a fragrant smell, and aromatic sweet taste, and is cultivated in France and Italy. It is to be chosen new, large, and fair; but when damp or dusty, to be rejected.

RECEIPT FOR ONE GALLON OF FENNEL WATER.

Take one pound of sweet fennel-seeds, and two gallons of water; put them into an alembic, and draw off one gallon with a gentle fire.

CHAPTER XI.

OF PEPPERMINT WATER.

PEPPERMINT is a very celebrated stomachic, and on that account greatly used at present, and its simple water often called for.

RECEIPT FOR A GALLON OF PEPPERMINT WATER.

Take of the leaves of dried peppermint, one pound and a half; water, two gallons and a half; put all into an alembic, and draw off one gallon, with a gentle fire.

The water obtained from peppermint by distillation in *Balneum Mariæ*, is more fragrant and more fully impregnated with the virtues of the plant than that drawn by the alembic. The same may be said with regard to that extracted by the cold still: when the cold still is used, the plant must be green, and, if possible, committed to the still with the morning dew upon it.

CHAPTER XII.

OF SPEARMINT WATER.

SPEARMINT is also, like peppermint, a great stomachic, and therefore constantly used.

RECEIPT FOR ONE GALLON OF SPEARMINT WATER.

Take of the leaves of dried spearmint one pound and a half; water, two gallons and a half; draw off by a gentle fire one gallon.

This water, like that drawn from peppermint, will be more fragrant if distilled in *Balneum Mariæ*, or the cold still; but if the latter be used, the same caution must be observed of distilling the plant green.

CHAPTER XIII.

OF BALM WATER.

Balm is a plant well known in our gardens. It flowers in July, and is of a fine cordial flavour; but so weak, that it is soon dissipated and lost; nor is it easy to dry it, so as to preserve its natural scent.

Balm water, therefore, should be drawn when the plant is green; and in order to procure the water in full perfection, it should be cohobated, or returned several times upon fresh parcels of the plant: by this means, a water may be procured from balm extremely rich, and of considerable use as a cordial.

If the *Balneum Mariæ* be used, the water is much better than that drawn by an alembic. The water drawn from this plant by the cold

still will also be very fragrant, and highly impregnated with the virtues of the plant.

CHAPTER XIV.

OF PENNYROYAL WATER.

PENNYROYAL, a plant very common in England, is very warm, and its parts very subtile and penetrating: it is one of the first plants in esteem in the present practice, as well as in former ages, as an attenuant and uterine. It is good in flatulencies and suppressions of urine, and by many is greatly recommended in dropsies, jaundices, and other chronic distempers. It communicates its virtues to water in infusion, and its simple water has, perhaps, more virtue than any other kept in the shops. But as it is requisite, in order to obtain a water fully impregnated with the virtues of balm, to cohobate it on fresh parcels of the plant, the water drawn from green pennyroyal, on the contrary, generally contains so large a portion of the essential oil, that it is necessary to separate what floats on the surface of the water by the separating glass.

RECEIPT FOR ONE GALLON OF PENNYROYAL WATER.

Take of the dried leaves of pennyroyal one pound and a half; of water, three gallons; draw off one gallon with a gentle fire.

The water drawn from green pennyroyal by the cold still is very fragrant, and fully impregnated with the virtues of the plant.

CHAPTER XV.

OF JAMAICA PEPPER WATER.

JAMAICA pepper, or pimento, is the fruit of a tall tree growing in the mountainous parts of Jamaica, where it is much cultivated, because of the great profit arising from the cured fruit, sent in large quantities annually into Europe.

It is gathered when green, and exposed to the sun for many days on cloths, and frequently shook and turned, till thoroughly dry: great care is taken during the time of drying to defend the fruit from the morning and evening dews; when thoroughly dried, it is sent over to us.

It is a very noble aromatic, and deserves to be used more frequently than it is at present. The simple water drawn from it is a better carminative than any other simple water at present in use.

RECEIPT FOR A GALLON OF JAMAICA PEPPER WATER.

Take of Jamaica pepper half a pound, water two gallons and a half; draw off one gallon with a pretty brisk fire. The oil of this fruit is very ponderous, and therefore this water is best made in an alembic.

CHAPTER XVI.

OF CASTOR WATER.

This drug is brought to us in the pods or bags that naturally contained it, and these so much resemble the testicles of an animal, both in their dry state, and when on the body of the creatures, that it is no wonder people who did not examine their situation on the animal, really took them for such; it is, however, a peculiar secreted matter, contained in bags destined to receive it.

Castor is an indurated substance, formed of a matter once fluid; the thinner part of which has been evaporated by drying. It is a light and friable matter, of a moderately lax texture, and of a deep dusky brown colour. It is of a somewhat acrid and bitterish taste, and of a strong fetid smell, which, to many, is very disagreeable.

The animal that produces the castor is by all authors called castor and fiber, and by the vulgar the beaver.

The castor of several parts of the world differ in goodness, and in regard to the care taken in the drying. The Russian castor has long been the most esteemed, and the New England kind the least.

Castor water is of great use in hysteric cases, and all diseases of the nerves; in epilepsies, palsies, and all complaints of that kind.

RECEIPT FOR MAKING ONE GALLON OF CASTOR WATER.

Take of Russia castor an ounce, of water

three gallons; draw off one gallon with a pretty brisk fire.

CHAPTER XVII.

OF ORANGE-PEEL WATER.

THE orange is a fruit too well known to need a description here. The water is very grateful to the taste, and often used in fevers, &c.

RECEIPT FOR ONE GALLON OF ORANGE-PEEL WATER.

Take of the outward yellow rind of Seville oranges four ounces, water three gallons and a half; draw off one gallon by the alembic, with a pretty brisk fire.

CHAPTER XVIII.

OF THE WATER OF DILL-SEED.

DILL greatly resembles fennel, both in root, stalk, or leaf, but rarely grows so tall, or is so much branched; it bears the same kind of yel-

low umbels of flowers, after which comes seeds, rounder, broader, and flatter than those of fennel. The whole plant is of a strong scent, less pleasant than fennel. It grows in gardens, and flowers and seeds in July and August. The water drawn from the seeds is heating and carminative, good in cholics, and all disorders arising from wind.

RECEIPT FOR MAKING A GALLON OF THE WATER OF DILL-SEED.

Take of dill-seed one pound, water three gallons; distil off by the alembic one gallon, with a pretty brisk fire.

The waters we have enumerated in this part are those now commonly in use, though there are many other herbs from whence waters of great use may be drawn; but as the method of distillation is the same in all, it would be of no use to extend these instructions to a greater length; we shall therefore only observe, that when unfavourable seasons have prevented the herbs from attaining a proper degree of perfection, it will be necessary to increase their proportion in extracting the several waters ordered to be drawn by the alembic.

PART III.

OF MAKING COMPOUND WATERS AND CORDIALS.

THE perfection of this grand branch of distillery depends upon the observation of the following general rules, easy to be observed and practised.

1. The artist must always be careful to use a well cleansed spirit, or one freed from its own essential oil, as was before observed, Part I. Chap. xxiii. For as a compound water is nothing more than a spirit impregnated with the essential oil of the ingredients, it is necessary that the spirit should have deposited its own.

2. Let the time of previous digestion be proportioned to the tenacity of the ingredients, or the ponderosity of their oil. Thus, cloves and cinnamon require a longer digestion before they are distilled than calamus aromaticus or orange-peel. Sometimes cohobation (explained in Part II. Chap. iii.) is necessary; for instance, in making the strong cinnamon water; because the

essential oil of cinnamon is so extremely ponderous, that it is difficult to bring it over the helm with the spirit without cohobation.

3. Let the strength of the fire be proportioned to the ponderosity of the oil intended to be raised with the spirit. Thus, for instance, the strong cinnamon water requires a much greater degree of fire than that from such lax vegetables as mint, balm, &c.

4. Let only a due proportion of the finest parts of the essential oil be united with the spirit; the grosser and less fragrant parts of the oil not giving the spirit so agreeable a flavour, and at the same time renders it thick and unsightly. This may in a great measure be effected by leaving out the faints, and making up to proof with fine soft water in their stead.

These four rules carefully observed will render this extensive part of distillation far more perfect than it is at present. Nor will there be any occasion for the use of burnt alum, white of eggs, isinglass, &c. to fine down cordial waters; for they will presently be fine, sweet, and pleasant-tasted, without any farther trouble.

CHAPTER I.

OF STRONG CINNAMON WATER.

We have already (Chap. viii. Part II.) described this drug, and given some directions for chusing the best sort, to which the reader is referred.

RECEIPT FOR SIXTEEN GALLONS OF STRONG CINNAMON WATER.

Take eight pounds of fine cinnamon bruised, seventeen gallons of clean rectified spirit, and two gallons of water. Put them into your still, and digest them twenty-four hours with a gentle heat; after which draw off sixteen gallons by a pretty strong heat.

I have ordered a much larger quantity of cinnamon than is common among distillers, because when made in the manner above directed, it is justly looked upon as one of the noblest cordial waters of the shops; but when made in the common way, of two pounds to twenty gallons of spirit, as some have ordered, is only an imposition on the buyer. Some also, to render the

goods cheaper, use equal quantities of cinnamon and cassia lignea; but by this means the cordial is rendered much worse: and, therefore, if you desire a fine cinnamon water the above receipt will answer your intention; but if a cheaper sort be desired, you may lessen the quantity of cinnamon, and add cassia lignea in its stead. If you would dulcify your cinnamon water, take double-refined sugar, what quantity you please, (the general proportion is about two pounds to a gallon), and dissolve it in the spirit after you have made it up proof with clean water. One general caution is here necessary to be added, namely, that near the end of the operation you carefully watch the spirit as it runs into the receiver, in order to prevent the faints mixing with the goods. This you may discover by often catching some of it, as it runs from the worm, in a glass, and observing whether it is fine and transparent; for as soon as ever the faints begin to rise, the spirit will have an azure or bluish cast. As soon therefore as you perceive this alteration, change the receiver immediately; for if you suffer the faints to mix with your other goods, the value of the whole will be greatly lessened. With regard to the faints they are to be kept by themselves, and poured into the still when a fresh parcel of the same goods is to be made.

It is also necessary to observe here, once for all, that the distillers call all goods made up proof, *double goods;* and those which are below proof, *single.* This observation will be alone sufficient to instruct the young distiller how he may at any time turn his proof or double goods into single.

CHAPTER II.

OF CLOVE WATER.

Cloves, from whence this water takes its name, are the fruit of a tree growing in the Molucca Islands. The figure of this fruit is oblong, and not very thick, resembling, in some measure, a nail. The surface of it is rough, and the colour a dusky brown, with an admixture of reddish. The whole fruit is of an extremely fragrant smell, and of an acrid, pungent, and very aromatic taste. Cloves are to be chosen the largest, fairest, darkest coloured, the heaviest, and most unctuous on the surface when pressed between the fingers. Cloves are carminative, and good against all distempers of the head arising from cold causes. They strengthen the sight, and are good against faintings, palpitations of the heart, and crudities in the stomach.

RECEIPT FOR FIFTEEN GALLONS OF CLOVE WATER.

Take of cloves bruised four pounds, pimento, or all-spice, half a pound, clean proof spirit sixteen gallons; let it digest twelve hours in a gentle heat, and then draw off fifteen gallons with a pretty brisk fire. Or,

Take Winter's bark four pounds, pimento six ounces, cloves one pound and a quarter, clean proof spirits sixteen gallons; digest, and draw off as before.

The Winter's bark, added in the second receipt, is the bark of a large tree growing in several parts of America, and has its name from its discoverer, Captain Winter.

The outer rind of it is of an uneven surface, and of a loose texture, very brittle, and easily powdered. The inner part, in which the principal virtue resides, is hard, and of a dusky reddish-brown colour. It is of an extremely fragrant and aromatic smell, and of a sharp, pungent, and spicy taste, much hotter than cinnamon in the mouth, and leaving in it a more lasting flavour. It is to be chosen in pieces not too large,

having the inner or brown part firm and sound, and of a very pungent taste. It is apt to be worm-eaten; but in that case it should be wholly rejected, as having lost the most essential part of its virtue.

If you desire to have your clove water red, it may be coloured either by a strong tincture of cochineal, alkanet-root, or corn-poppy flowers. The first gives the most elegant colour; but it is not often used on account of its dearness.

You may dulcify it to your palate by dissolving in it double-refined sugar. Some for cheapness use a coarser kind of sugar; but this renders the goods foul and unsightly. Some also, to save expenses, make what they call clove water, with cloves and caraway seeds: the proportion they generally use is half an ounce of cloves and two drachms of caraway seeds to a gallon of spirit.

CHAPTER III.

OF LEMON WATER.

The peel of the lemon, the part used in making this water, is a very grateful bitter aromatic,

and on that account very serviceable in repairing and strengthening the stomach.

RECEIPT FOR TEN GALLONS OF LEMON WATER.

Take of dried lemon-peel four pounds, clean proof spirit ten gallons and a half, and one gallon of water. Draw off ten gallons by a gentle fire. Some dulcify lemon water; but by that means its virtues as a stomachic are greatly impaired.

CHAPTER IV.

OF HUNGARY WATER.

Rosemary, the principal ingredient in Hungary water, has always been a favourite shrub in medicine; it is full of volatile parts, as appears by its taste and smell. It is a very valuable cephalic, and is good in all disorders of the nerves; in hysteric and hypochondriac cases, in palsies, apoplexies and vertigoes. Some suppose that the flowers possess the virtues of the whole plant in a more exalted degree than any other part; but the flowery tops, leaves, and husks, together with the flowers themselves, are much fitter for all purposes than the flowers alone.

RECEIPT FOR TEN GALLONS OF HUNGARY WATER.

Take of the flowery tops, with the leaves and flowers of rosemary, fourteen pounds, rectified spirit eleven gallons and a half, water one gallon; distil off ten gallons with a moderate fire. If you perform this operation in *Balneum Mariæ*, your Hungary water will be much finer than if drawn by the common alembic.

This is called Hungary water, from its being first made for a princess of that kingdom. Some add lavender flowers, and others Florentine orice-root; but what is most esteemed is made with rosemary only.

CHAPTER V.

OF LAVENDER WATER.

THERE are two sorts of lavender water, the simple and compound: the first is much used externally on account of its fragrancy and cephalic virtues; the latter internally in a great number of disorders.

RECEIPT FOR TEN GALLONS OF SIMPLE LAVENDER WATER.

Take fourteen pounds of lavender flowers, ten gallons and a half of rectified spirit of wine, and one gallon of water; draw off ten gallons with a gentle fire; or, which is much better, in *Balneum Mariæ.*

Both the Hungary and lavender water may be made at any time of the year without distillation, by mixing the oil of the plant with highly rectified spirit of wine. In order to this, when the plant is in perfection, you should distil a large quantity of it in water with a very brisk fire; placing under the nose of the worm the separating glass, (described page 32. Part I. of this Treatise), by which means you will obtain the essential oil of the plant, in which both its fragrancy and virtue reside. Having procured the essential oil of the plant, the water may readily be made in the following manner: Put the rectified spirit into the receiver (described page 33. fig. 12.) and let an assistant shake it with a quick motion: whilst the spirit is thus agitated, drop in leisurely the essential oil, and it will mix without any foulness or milkiness. The oils of lavender

and rosemary are imported cheaper from abroad than they can be made here; but these oils will not mix with the spirit without rendering it foul and milky; and therefore if you propose making Hungary or lavender water in this manner, it will be necessary to extract the oil yourself.

RECEIPT FOR MAKING THREE GALLONS OF COMPOUND LAVENDER WATER.

Take of lavender water above described two gallons, of Hungary water one gallon, cinnamon and nutmegs of each three ounces, and of red saunders one ounce; digest the whole three days in a gentle heat, and then filter it for use. Some add saffron, musk, and ambergris, of each half a scruple; but these are now generally omitted.

This compound lavender water has been long celebrated in all nervous cases. In all kinds of palsies, and loss of memory, it is of the greatest service; and has been so much remarked for its efficacy in these complaints, as almost universally to obtain the name of *Palsy Drops*.

CHAPTER VI.

OF CITRON WATER.

THE citron is an agreeable fruit, resembling a lemon in colour, smell, and taste. The inside is white, fleshy, and thick, containing but a small quantity of pulp, in proportion to the bigness of the fruit.

RECEIPT FOR MAKING TEN GALLONS OF CITRON WATER.

Take of dry yellow rinds of citron four pounds, clean proof spirit ten gallons and a half, water one gallon; digest the whole twenty-four hours with a gentle heat; draw off ten gallons with a gentle fire, or, which is much better, in *Balneum Mariæ*, and dulcify it with fine sugar to your palate. Or,

Take of dry yellow rinds of citron three pounds, of orange peel two pounds, nutmegs bruised three quarters of a pound; digest, draw off, and dulcify as before.

This is one of the most pleasant cordials we

have; and the addition of the nutmegs, in the second receipt, increases its virtue as a cephalic and stomachic.

CHAPTER VII.

OF ANISEED WATER.

ANISEED is a small seed of an oblong shape, each way ending in an obtuse point; its surface is very deeply striated, and it is of a soft and lax substance, very light and easily broken. Its colour is a kind of pale olive, or greenish-grey; it has a very strong and aromatic smell, and a sweetish but acrid taste, but in the whole not disagreeable. Aniseed should be chosen large, fair, new, and clean, of a good smell, and acrid taste. The plant that produces it is cultivated in many parts of France; but the finest seed comes from the island of Malta, where it is raised for sale, and whence a great part of Europe is supplied.

RECEIPT FOR TEN GALLONS OF ANISEED WATER.

Take of aniseed bruised two pounds, proof spirits twelve gallons and a half, water one gallon; draw off ten gallons, with a moderate fire. Or,

Take of the seeds of anise and angelica, each two pounds, proof spirit twelve gallons and a half; draw off as before.

Aniseed water should never be reduced below proof, because of the large quantity of oil with which the spirit is impregnated, and which will render the goods milky and foul when brought down below proof; but if there be a necessity for doing this, the goods must be filtrated either through paper or the filtrating bag, which will restore their transparency.

Aniseed water is a good carminative, and therefore in great request among the common people against the cholic.

CHAPTER VIII.

OF CARAWAY WATER.

CARAWAY SEED is of an oblong and slender figure, pointed at both ends, and thickest in the middle. It is striated on the surface, considerably heavy, of a deep brown colour, and somewhat bright or glossy. It is of a very penetrating smell, not disagreeable, and of a hot, acrid, and

bitterish taste. Caraway seed is to be chosen large, new, and of a good colour, not dusty, and of an agreeable smell. The plant which produces the caraway seed grows wild in the meadows of France and Italy, and in many other places; but is sown in fields for the sake of the seeds in Germany, and many other parts of Europe.

RECEIPT FOR MAKING TEN GALLONS OF CARAWAY WATER.

Take of caraway seeds bruised three pounds, proof spirit twelve gallons, water two gallons; draw off ten gallons, or till the faints begin to rise; make the goods up with clean water, and dulcify with common sugar to your taste. Or,

Take of caraway seed bruised two pounds and a half, orange or lemon-peel dried one pound, proof spirit twelve gallons, water two gallons; draw off and dulcify as before.

Caraway water, like that of aniseed, is a good carminative; but not so much used, though much pleasanter.

CHAPTER IX.

OF CARDAMOM SEED WATER.

THE seed from whence this water takes its name, is called by botanists *Cardamum Minus*, or the lesser cardamom, to distinguish it from the *Cardamomum Majus*, or grains of paradise.

The lesser cardamom is a small short fruit, or membranaceous capsule, of a trigona form, about a third of an inch long, and swelling out thick about the middle; beginning small and narrow from the stalk, and terminating in a small but obtuse point at the end. It is striated all over very deeply with longitudinal furrows, and consists of a thin but very tough membrane, of a fibrous texture, and pale-brown colour, with a faint cast of red. When the fruit is thoroughly ripe, this membrane opens at the three edges all the way, and shews that it is internally divided by three thin membranes into three cells, in each of which is an arrangement of seeds, separately lodged in two series. The seeds are of an irregular angular figure, rough, and of a dusky brown colour on the surface, with a mixture of yellowish and reddish, and of a white colour within. They

have not much smell, unless first bruised, when they are much like camphire under the nose. They are of an acrid, aromatic, and fiery hot taste. They should be chosen sound, close shut on all sides, and full of seeds, of a good smell, and of an acrid aromatic taste.

RECEIPT FOR TEN GALLONS OF CARDAMOM SEED WATER.

Take of the lesser cardamom seeds husked two pounds and a half, of clean proof spirit ten gallons and a half, and of water one gallon; draw off ten gallons by a gentle heat. You may either dulcify it or not with fine sugar at pleasure.

This water is carminative, assists digestion, and good to strengthen the head and stomach.

CHAPTER X.

OF AQUA MIRABILIS; OR THE WONDERFUL WATER.

Most of the ingredients in this composition have already been described, and an account of the nutmegs will be given in Chap. xxv. But the cubebs and ginger remain to be mentioned.

Cubebs are small dried fruit resembling a pepper-corn, but often somewhat longer; of a dark brown colour, composed of a wrinkled external bark; of an aromatic, though not very strong smell, and of an acrid and pungent taste, though less so than pepper; but its acrimony continues long on the tongue, and draws forth a large quantity of saliva. We have two kinds of cubebs, which differ only in their periods of gathering; both are produced from the same plant. The unripe cubebs are small, very wrinkled on the surface, and their nucleus, when broken, is flaccid: but the ripe ones not so. Cubebs are brought from the island of Java, where they grow in great abundance. They should be chosen large, fresh, and sound, and the heaviest possible. They are warm and carminative, and esteemed good in vertigoes, palsies, and disorders of the stomach.

Ginger is a root too well known to need a long description; it is sufficient to observe, that it is of a pale yellowish colour when broken, of a fibrous structure, and easily beat into a sort of woolly or long thready matter. It is of a very hot, acrid, and very pungent taste; but aromatic withal, and of an agreeable smell. We have it both from the East and West Indies; but the oriental is much superior to the occidental in its

flavour, of a firmer substance, and does not beat out so much into threads. Ginger is an excellent carminative and stomachic; it assists digestion, dispels flatuses, and takes off cholic pains almost instantaneously.

There are several receipts for making this celebrated cordial; but the following are allowed to be the best.

Take of cinnamon one pound and a quarter, rind of lemon-peels ten ounces, cubebs one ounce and a quarter, leaves of balm one pound; bruise all these ingredients, and pour on them eleven gallons of clean proof spirit, and one gallon of water: digest the whole twenty-four hours, and distill off ten gallons with a pretty brisk fire; and dulcify it with fine sugar. Or,

Take of the lesser cardamoms, cloves, cubebs, galangal, mace, nutmeg, and ginger, of each one pound and three-quarters; of the yellow part of citron-peel and cinnamon, of each three pounds and a half; of the leaves of balm one pound; bruise these ingredients, and pour on them eleven gallons of spirit and one gallon of water: digest, and draw off, &c. as before.

This cordial has been long celebrated as a noble stomachic, and therefore greatly called for.

Some, instead of all the ingredients enumerated in the above receipts, use only pimento; and this is the sort of *aqua mirabilis* which some sell so very cheap.

CHAPTER XI.

OF MINT WATER.

THE mint intended in this receipt is the common spearmint, an account of which has already been given, page 138.

RECEIPT FOR TEN GALLONS OF MINT WATER.

Take of dry spearmint leaves fourteen pounds, proof spirit ten gallons and a half, water two gallons; draw off ten gallons by a gentle heat. You may dulcify it with sugar if required.

Mint water is greatly recommended by the learned Boerhaave and Hoffman, against vomiting, nauseas, and the cholic.

CHAPTER XII.

OF PEPPERMINT WATER.

THE peppermint has been already described, page 137. to which the reader is referred.

RECEIPT FOR TEN GALLONS OF PEPPERMINT WATER.

Take of dry peppermint leaves fourteen pounds, proof spirit ten gallons and a half, water one gallon; draw off ten gallons by a gentle fire. You may either dulcify it or not.

Peppermint water is a noble stomachic, good against vomiting, nauseas, cholic, and other griping pains in the bowels, in all which intentions it greatly exceeds the common spearmint water.

CHAPTER XIII.

OF ANGELICA WATER.

THERE are two sorts of angelica water, the single and the compound. I shall give receipts for making both kinds; and with regard to the

nature of angelica, it is sufficient to observe, that it is an excellent carminative.

RECEIPT FOR TEN GALLONS OF SINGLE ANGELICA WATER.

Take of the roots and seeds of angelica, cut and bruised, of each one pound and a half, proof spirit eleven gallons, water two gallons: draw off ten gallons, or till the faints begin to rise, with a gentle fire; and dulcify it, if required, with lump sugar.

This angelica water is a good carminative, and therefore good against all kinds of flatulent cholics, and gripings of the bowels.

RECEIPT FOR TEN GALLONS OF COMPOUND ANGELICA WATER.

Take of the roots and seeds of angelica, and of sweet fennel seeds, of each one pound and a half, of the dried leaves of balm and sage, of each one pound; slice the roots, and bruise the seeds and herbs, and add to them of cinnamon one ounce, of cloves, cubebs, galangals, and mace, of each three-quarters of an ounce, of nutmegs, the lesser cardamom seed, pimento and saffron, of each half an ounce; infuse all these in twelve gallons of clean proof spirit, and draw off ten

gallons, with a pretty brisk fire. It may be dulcified or not at pleasure.

This is an excellent composition, and a powerful carminative; and good in all flatulent cholics, and other griping pains in the bowels. It is also good in nauseas, and other disorders of the stomach.

It may not be amiss to observe here, that in distilling this and several other compositions, abounding with oily seeds, the operator should be careful not to let the faints mix with the other goods, as they would by that means be rendered nauseous and unsightly: he should therefore be careful, towards the latter end of the operation, to catch some of the spirit as it runs from the worm in a glass; and as soon as ever he perceives it the least cloudy, to remove the receiver, and draw the faints by themselves.

CHAPTER XIV.

OF ORANGE WATER.

This water is made in the same manner from the peels of oranges, as citron water (Chap. vi.) is from the peels of citrons.

RECEIPT FOR TEN GALLONS OF ORANGE WATER.

Take of the yellow part of fresh orange-peels five pounds, clean proof spirit ten gallons and a half, water two gallons; draw off ten gallons with a gentle fire.

This is a good stomachic, and may also be used for making bitter tinctures, as that called *Stoughton's Drops.*

CHAPTER XV.

OF PLAGUE WATER.

THERE are several receipts for making plague water; but the following are much the best:—

RECEIPT FOR TEN GALLONS OF PLAGUE WATER.

Take of the roots of masterwort and butter-burr, of each one pound and a quarter; of Virginia snake-root and zedoary, of each ten ounces; angelica seeds and bay seeds, of each fourteen ounces; and of the leaves of scordium one pound and a half. Cut or bruise these ingredients, and put them into the still with twelve gallons of

clean proof spirit, and two gallons of water; digest the whole for twenty-four hours, and draw off ten gallons. Or,

Take of the leaves of celandine, rosemary, rue, sage, Roman wormwood, dragons, agrimony, balm, scordium, the lesser centaury, carduus benedictus, betony, and mint, of each twenty handfuls; of dried angelica root, zedoary, and gentian, of each ten ounces; and of Virginia snake-root five ounces: digest these twenty-four hours, in twelve gallons of clean proof spirit, and two gallons of water; and then draw off ten gallons as before. Or,

Take of rue, rosemary, balm, carduus benedictus, scordium, marigold flowers, dragons, goat's rue, and mint, of each ten handfuls; roots of masterwort, angelica, butter-burr, and piony, of each one pound and a quarter; and of viper-grass ten ounces: digest in twelve gallons of spirit, &c. as before. Or,

Take of the roots of masterwort, gentian, and snake-root, of each seven ounces; green walnuts bruised, eighty; Venice treacle and mithridate, of each three ounces; camphire six drachms; of the roots of rue and elecampane, of each three

ounces; horehound six ounces; saffron six drachms; proof spirit twelve gallons: digest, &c. as before. Or,

Take dragons, rosemary, wormwood, sage, scordium, mugwort, scabious, balm, carduus, angelica, marigold flowers, centaury, betony, pimpernel, celandine, rue, and agrimony, of each three pounds; of the roots of gentian, zedoary, liquorice, and elecampane, of each twelve ounces; twelve gallons of spirits: digest, &c. as before. Or,

Take of green walnuts, five pounds; of angelica root, two pounds; of the leaves of angelica, rue, sage, and scordium, of each ten handfuls; of nutmegs, long pepper, ginger, camphire, and gentian root, of each five ounces; of snake-root, contrayerva, elecampane, zedoary, and viper-grass, of each thirteen ounces; Venice treacle and mithridate, of each thirteen ounces; white-wine vinegar, seven pounds; proof spirit, twelve gallons: digest, &c. as before.

You may either dulcify your plague water or not, as you see occasion.

All the above receipts for making plague water are in use; but the first is the most elegant, con-

taining nothing but what is proper in the intention, and at the same time adapted to give its virtues by distillation; which cannot be said of any of the rest, several of the ingredients adding no virtue at all to the water. Of this kind are the celandine, carduus, centaury, gentian, walnuts, &c.

Plague water is a noble alexipharmic, and a high carminative cordial in malignant cases, and of great use in lowness of spirits, and depressions.

CHAPTER XVI.

OF DR STEPHENS'S WATER.

THIS water has its name from its inventor, a physician of great learning and practice.

RECEIPT FOR TEN GALLONS OF DR STEPHENS'S WATER.

Take of cinnamon, ginger, galangal, cloves, nutmegs, grains of paradise, the seeds of anise, sweet fennel, and caraway, of each one ounce; of the leaves of thyme, mother of thyme, mint, sage, pennyroyal, rosemary, flowers of red roses, camomile, origanum, and lavender, of each eight handfuls; of clean proof spirit, twelve gallons;

water, two gallons: digest all twenty-four hours, and then draw off ten gallons, or till the faints begin to rise. Dulcify with fine sugar to your palate.

This is a noble cephalic cordial and carminative; and also, in some degrees, an hysteric; good in all cholic pains in the stomach and bowels, and diseases of the nerves.

CHAPTER XVII.

OF SURFEIT WATER.

THERE are two kinds of surfeit water, one made by distillation, and the other by infusion; the former is generally called *White Surfeit Water*, and the latter *Red Surfeit Water*.

RECEIPT FOR TEN GALLONS OF WHITE SURFEIT WATER.

Take marigold flowers, mint, centaury, rosemary, scordium, mugwort, carduus, rue, St John's wort, balm, and dragons, of each seven handfuls; of the roots of piony, viper-grass, butter-burr, and angelica, of each one pound and a half; of galangal, calamus aromaticus, and of the seeds of angelica and caraway, of each four

ounces; of the flowers of red poppies ten handfuls; proof spirit twelve gallons; water two gallons: digest for twenty-four hours, and then draw off ten gallons, or till the faints begin to rise; and dulcify with fine sugar.

This is a good cordial, but would not be the worse, if the carduus, mugwort, rue, and St John's wort, were omitted, as little of their virtues can be obtained by distillation. It is, however, a good alexipharmic, carminative, and stomachic; and therefore good in all flatulent pains in the stomach and bowels, in nauseas and surfeits, from whence it had its name.

RECEIPT FOR MAKING TEN GALLONS OF RED SURFEIT WATER.

Take of the flowers of red poppies two bushels, eleven gallons of clean proof spirit, and digest them with a gentle heat for three days, or till the spirit has extracted all the colour of the flowers: then press out the liquor from the flowers, and add to the tincture of the seeds of caraway and coriander, and liquorice-root sliced, of each ten ounces; of cardamoms and cubebs, of each four ounces; of raisins stoned, five pounds; of cinnamon, five ounces; of nutmegs, mace,

and ginger, of each three ounces; of cloves, two drachms; of juniper berries, three ounces. Let the whole be digested three days, then press out the liquor, adding to it a gallon of rose water; and then strain or filter the whole through a flannel bag.

This water is much superior to the preceding, as all the ingredients will give their virtues to the tincture, though they will not rise in distillation. It is a noble alexipharmic, it strengthens the stomach, and greatly assists digestion; it is also an excellent carminative, and good against the cholic and gripes: its cordial virtues render it serviceable in all tremblings of the nerves, and depressions of the spirits.

CHAPTER XVIII.

OF WORMWOOD WATER.

THERE are two sorts of wormwood water, distinguished by the epithets of *greater* and *lesser*.

RECEIPT FOR TEN GALLONS OF THE LESSER COMPOSITION OF WORMWOOD WATER.

Take of the leaves of dried wormwood, five

pounds; of the lesser cardamom seeds, five ounces; of coriander seeds, one pound; of clean proof spirit, eleven gallons; water, one gallon. Draw off ten gallons, or till the faints begin to rise, with a gentle fire. It may be dulcified with sugar, or not, at pleasure.

This is a good stomachic and carminative; and on that account often called for.

RECEIPT FOR TEN GALLONS OF THE GREATER COMPOSITION OF WORMWOOD WATER.

Take of the common and sea wormwood, dried, of each ten pounds; of sage, mint, and balm, dried, of each twenty handfuls; of the roots of galangal, ginger, calamus aromaticus, and elecampane, of the seed of sweet fennel and coriander, of each three ounces; of cinnamon, cloves, and nutmegs, the lesser cardamoms and cubebs, of each two ounces. Cut and bruise the ingredients as they require; digest them twenty-four hours in eleven gallons of fine proof spirit, and two gallons of water; and draw off ten gallons, or till the faints begin to rise, with a pretty brisk fire.

This is an excellent composition, and good in

all diseases of the stomach, arising either from wind or a bad digestion. It is greatly in use in some parts of England, but comes too dear for the common sort of people; on which account a cordial water is often sold under the title of *the greater composition of wormwood water*, drawn from the leaves of wormwood, orange and lemon-peel, calamus aromaticus, pimento, and the seeds of anise and caraway; which being all cheap ingredients, the composition may be sold at a moderate price. A water drawn in this manner is a good carminative, but far inferior to that made by the above receipt.

CHAPTER XIX.

OF ANTISCORBUTIC WATER.

THE scurvy being a disease very common in England, this antiscorbutic water will be of great use.

RECEIPT FOR MAKING TEN GALLONS OF ANTISCORBUTIC WATER.

Take of the leaves of water-cresses, garden and sea scurvy-grass, and brook-lime, of each

twenty handfuls; of pine tops, germander, horehound, and the lesser centaury, of each sixteen handfuls; of the roots of briony and sharp-pointed dock, of each six pounds; of mustard seed one pound and a half. Digest the whole in ten gallons of proof spirit, and two gallons of water, and draw off by a gentle fire.

This is a good water for the purposes expressed in the title, viz. against scorbutic disorders. It is also good in tremblings, and disorders of the nerves.

CHAPTER XX.

OF COMPOUND HORSE-RADISH WATER.

THERE are several methods of making this compound water; but the three following receipts are the best that have hitherto appeared.

RECEIPT FOR MAKING TEN GALLONS OF COMPOUND HORSE-RADISH WATER.

Take of the leaves of fresh garden scurvy-grass, sixteen pounds; of fresh horse-radish root, and the yellow part of Seville orange-peel, of each eight pounds; of nutmegs two pounds.

Cut and bruise these ingredients, and digest them twenty-four hours in ten gallons of proof spirit, and two gallons of water: after which draw off ten gallons with a gentle fire. Or,

Take of the fresh roots of horse-radish, nine pounds; of the leaves of water-cresses, and of garden scurvy-grass, of each six pounds; of the outward, or yellow peel of oranges and lemons, of each nine ounces; of Winter's bark, twelve ounces; of nutmegs, three ounces. Cut, bruise, and digest the ingredients in ten gallons of proof spirit, and two gallons of water, and draw off ten gallons as before. Or,

Take of the leaves of garden and sea scurvy-grass, fresh gathered in the spring, of each seven pounds; brook-lime, water-cresses, and horse-radish root, of each ten pounds; of Winter's bark and nutmegs, of each ten ounces; of the outer peel of lemons, one pound; of arum root, fresh gathered, two pounds; proof spirits, ten gallons; water, two gallons. Bruise and slice the ingredients; digest the whole, and draw off ten gallons as before.

Either of the above receipts will produce an excellent water against all obstructions of the

kidneys and other viscera. It is also of great service in the jaundice, cachexies and dropsies; and, in all scorbutic cases, it is equal to any medicine; as it opens the minute passages, promotes transpiration, and cleanses the skin, and other small glands, which are filled with gross particles to the detriment of their proper offices.

CHAPTER XXI.

OF TREACLE WATER.

THIS water is made in a very different manner by different persons; but the following receipts are the best for this purpose.

RECEIPT FOR MAKING TEN GALLONS OF TREACLE WATER.

Take of the fresh and green husks of walnuts, four pounds and a half; of the roots of butterburr, three pounds; of angelica and masterwort, of each one pound and a half; of zedoary, twelve ounces; of the leaves of rue and scordium, of each eighteen ounces; of Venice treacle, three pounds. Digest them together four days in twelve gallons of proof spirit, and two gallons of water; after which draw off ten gal-

lons; to which add a gallon and a half of distilled vinegar. Or,

Take of the rind of green walnuts, five pounds; of rue, four pounds; of carduus, marigold, and balm, of each three pounds; of fresh gathered butter-burr roots, two pounds and a half; of burdock root, one pound and a half; of green scordium, twelve handfuls; of Venice treacle and mithridate, of each two pounds and a half; proof spirit, twelve gallons; and water, two gallons. Digest and draw off ten gallons, as before; to which add a gallon and a half of distilled vinegar.

Some, instead of distilled vinegar, unadvisedly add a proportional quantity of spirit of vitriol, or other mineral acid, to their treacle water; but this practice is very pernicious, and entirely alters the nature of the medicine. Vinegar is an acid made by a double fermentation, and therefore of a different nature from the acid juices of vegetables, whether oranges, lemons, citrons, limes, crabs, barberries, &c. as also from those of minerals, whether vitriol, sulphur, &c. It is, indeed, like them, acid on the tongue; but then it liquefies the blood, is antipestilential, suddenly cures drunkenness, surfeits, the plague, and does a thousand things, both as a menstruum and medi-

cine, which they will not. This is an admirable and sprightly alexipharmic and sudorific, to which the vinegar added greatly contributes, and therefore good in fevers, the small-pox, measles, and other pestilential disorders.

CHAPTER XXII.

COMPOUND CAMOMILE FLOWER WATER.

THE camomile flowers generally used are the double sort, consisting wholly of petals or flower leaves, without any appearance of stamina or pistil, or the other parts of fructification, which, in the single flowers, shew themselves in the middle in form of yellow threads. But though the double flowers are the sort commonly used, they are not the best, or those which ought to be chosen. The single flowers, or those which consist of only a single series of leaves, or petals, in form of rays, surrounding a cluster of yellow threads or stamina, have much more virtue. It is, indeed, in these stamina and their apices that great part of the virtue of the flower resides, and these are wanting in the double flowers.

RECEIPT FOR MAKING TEN GALLONS OF COMPOUND CAMOMILE FLOWER WATER.

Take of dried camomile flowers, five pounds; of the outer peel of oranges, ten ounces; of the leaves of common wormwood and pennyroyal, of each twenty handfuls; of the seed of anise, cummin, sweet fennel, the berries of bay and juniper, of each five ounces. Digest these ingredients two days in ten gallons of proof spirit, and three gallons of water, and draw off ten gallons with a gentle fire.

This is a very good carminative and stomachic; good in all cholics and other disorders of the bowels from wind. It also provokes the appetite, and promotes a good digestion. Its virtues as a stomachic will not be less when made from the double flowers; but if intended as a carminative, it should be made with the single flowers.

CHAPTER XXIII.

IMPERIAL WATER.

This cordial water has its name from the great opinion conceived of it by its first inventors; and

though their opinion was, perhaps, justly founded, yet it is not at present so much in use as formerly.

RECEIPT FOR MAKING TEN GALLONS OF IMPERIAL WATER.

Take of the dried peels of citrons and oranges, of nutmegs, cloves, and cinnamon, of each one pound; of the roots of cypress, Florentine orrice, calamus aromaticus, of each eight ounces; of zedoary, galangal, and ginger, of each four ounces; of the tops of lavender and rosemary, of each sixteen handfuls; of the leaves of marjorum, mint, and thyme, of each eight handfuls; of the leaves of white and damask roses, of each twelve handfuls. Digest the whole two days in ten gallons of proof spirit, and four gallons of damask rose water; after which draw off ten gallons.

All the ingredients in composition coincide in one intention, and as such will give their virtues by distillation; circumstances that cannot be said of many other compound waters. It is a very good cephalic, and of great use in all nervous cases. It is also a very pleasant dram, especially if dulcified with fine sugar, and good upon any sudden sickness of the stomach.

CHAPTER XXIV.

OF COMPOUND PIONY WATER.

THE piony, from whence this compound water takes its name, is a plant divided into male and female; but the former is the sort intended to be used in this composition. The male and female plants are distinguished both by their roots and leaves. The male has a shining blackish leaf, from which the female differs by being lighter-coloured. The root of the male kind is more bulbous and shorter branched than that of the female, whose shoots are much longer and thinner.

RECEIPT FOR MAKING TEN GALLONS OF COMPOUND PIONY WATER.

Take of the roots of male piony, twelve ounces; of those of wild valerian, nine ounces; of those of white dittany six ounces; of piony seed four ounces and a half; of the fresh flowers of lily of the valley, one pound and a half; of those of lavender, Arabian stæchas, and rosemary, of each nine ounces; of the tops of betony, marjorum, rue, and sage, of each six ounces; slice and bruise the ingredients, and digest them four days in ten

gallons of proof spirit and two gallons of water: after which draw off ten gallons. Or,

Take of the flowers of lilies of the valley fresh gathered, and male piony root, of each two pounds; of cinnamon and cubebs, of each eight ounces; of rosemary and lavender flowers, of each two handfuls; of damask rose water, two gallons. Digest these four days in ten gallons of proof spirit, and draw off ten gallons as before.

This is an excellent cordial, and can be exceeded by nothing in all nervous cases, both in children and grown persons.

CHAPTER XXV.

OF NUTMEG WATER.

The nutmeg is a kernel of a large fruit not unlike the peach, and is separated from that and its investient coat the mace, before it is sent over to us; except when the whole fruit is sent over in preserve, by way of sweetmeat, or as a curiosity. There are two kinds of nutmegs, the one called by authors the male, and the other the female. The female is the kind in common use,

and is of the shape of an olive: the male is long and cylindric, and has less of the fine aromatic flavour than the other, so that it is much less esteemed, and people who trade largely in nutmegs will seldom buy it. Besides this oblong kind of nutmeg, we sometimes meet with others of very irregular figures; but these are mere *Lusus Naturæ*, being produced by the same tree. The long or male nutmeg, as we term it, is, by the Dutch, called the wild nutmeg: It is always distinguishable from the others, as well by its want of fragrancy as by its shape: it is very subject to be worm-eaten, and is strictly forbid by the Dutch to be packed among the other, because it will be the means of their being worm-eaten also, by the insects getting from it into them, and breeding in all parts of the parcel. The largest, heaviest, and most unctuous of the nutmegs are to be chosen, such as are of the shape of an olive, and of the most fragrant smell.

RECEIPT FOR MAKING TEN GALLONS OF NUTMEG WATER.

Take of nutmegs, bruised, one pound; proof spirit, ten gallons; water, two gallons. Digest them two days, and then draw off ten gallons with a brisk fire. You may either dulcify it or not, as occasion offers. Or,

Take of nutmegs, bruised, one pound; orange-peel, two ounces; spirit, ten gallons; water, two gallons. Digest, and distil as before.

This is an excellent cephalic and cordial water; agreeable to the palate, comfortable to the stomach, and grateful to the nerves. It powerfully discusses wind and vapours from the stomach and bowels, and is therefore of great service in the cholic, and griping of the bowels.

CHAPTER XXVI.

OF COMPOUND BRYONY WATER.

The white bryony root, from whence this water takes its name, is one of the largest roots we are acquainted with. It is of an oblong shape, and is frequently met with of the thickness of a man's arm, sometimes of twice or three times that bigness. Its texture is somewhat lax and spungy; considerably heavy, but so soft that the thickest pieces are easily cut through with one stroke of a knife; it is very juicy, and is externally of a brownish or yellowish-white colour, and of a pure white within: it is of a disagreeable smell, and an acrid and nauseous taste.

RECEIPT FOR TEN GALLONS OF COMPOUND BRYONY WATER.

Take of the roots of bryony, four pounds; wild valerian root, one pound; of pennyroyal and rue, of each two pounds; of the flowers of fever-few, and tops of savin, of each four ounces; of the rind of fresh orange-peel, and lovage seeds, of each half a pound: cut or bruise these ingredients, and infuse them in eleven gallons of proof spirit, and two gallons of water, and draw off ten gallons with a gentle heat. Or,

Take of fresh bryony root, four pounds; of the leaves of rue and mugwort, of each four pounds; of the tops of savin, six handfuls; of fever-few, catmint, and pennyroyal, of each four handfuls; of orange-peel, eight ounces; of myrrh, four ounces; of Russia castor, two ounces; proof spirit, eleven gallons; water, two gallons. Digest and distil as before.

This composition is very unpalatable, but excellently adapted to the intention of an hysteric, in which cases it is used with success. It is very forcing upon the uterus, and therefore given to promote delivery, and forward the proper cleansings afterwards; as also to open menstrual

obstructions, and in abundance of other female complaints. It is also good against convulsions in children, and of service in all nervous complaints of either sex.

It may not be amiss to observe here, that the oily parts of the ingredients will often render the water foul and milky. If, therefore, the distiller desires to have it fine and transparent, the receiver must be removed as soon as the liquor at the worm appears the least turbid, which will be long before the faints begin to rise. The water, however, is not the worse for being milky, with regard to its medicinal virtue. Some, when the liquor is milky, throw in a little burnt alum to fine it; but this should never be done, because it spoils the medicine.

CHAPTER XXVII.

OF COMPOUND BALM WATER, COMMONLY CALLED *EAU DE CARMES.*

THIS has its name *(Eau de Carmes)* from the Carmelite friars, who were the inventors of it. The great profit accruing to these fathers from the sale of this cordial, induced them to keep the method of making it a secret; but notwith-

standing all their care, the secret has at last been discovered, and the following is the method by which they prepare it.

RECEIPT FOR TWO GALLONS OF *EAU DE CARMES.*

Take of the fresh leaves of balm, four pounds; of the yellow peel or rind of lemons, two pounds; of nutmegs and coriander seeds, of each one pound; of cloves, cinnamon, and angelica root, of each half a pound. Pound the leaves, bruise the other ingredients, and put them, with two gallons of fine proof spirit, into a large glass alembic, (the figure of which, with its head, is represented on the plate, *Fig.* 7.) stop the mouth, and place it in a bath heat to digest two or three days. Then open the mouth of the alembic, and add a gallon of balm water, and shake the whole well together. After this place the alembic in *Balneum Mariæ*, and distil till the ingredients are almost dry; and preserve the water thus obtained in bottles well stopped.

This water has been long famous both at London and Paris, and carried thence to most parts of Europe. It is a very elegant cordial, and very extraordinary virtues are attributed to it; for it is esteemed very efficacious not only in lowness of

spirits, but even in apoplexies; and is greatly commended in cases of the gout in the stomach.

CHAPTER XXVIII.

OF LADIES' WATER.

THIS water has its name from its dearness, being much fitter for the closet than to be sold in a shop; but as it is an excellent cordial, I could not omit giving it a place here.

RECEIPT FOR ONE QUART OF LADIES' WATER.

Take of sugar-candy, one pound; of canary wine, six ounces; rose-water, four ounces; boil them into a syrup, and mix with it of heavenly water (described Chap. xxx.) one quart; of ambergris and musk, of each eighteen grains; of saffron, fifteen grains; yellow saunders, two drachms. Digest the whole three days in a vessel close stopped, and decant the clear for use.

This is an extraordinary cordial where the fumes are not offensive. It is too rich to be drank alone, and therefore should be mixed with water, or some other liquid.

CHAPTER XXIX.

OF CEPHALIC WATER.

THIS water has its name from its use, being one of the best cephalic waters known.

RECEIPT FOR TEN GALLONS OF CEPHALIC WATER.

Take of male piony root, twelve ounces; of angelica and valerian, of each four ounces and a half; of the leaves of rosemary, marjorum, and balm, of the flowers of lavender, betony, piony, marigolds, sage, rosemary, lilies of the valley, and of the lime-tree, of each three handfuls; of stæchas, or French lavender, four ounces and a half; of red roses and cowslips, of each six handfuls; of rhodium wood and yellow saunders, of each two ounces and a half; of nutmegs, four ounces and a half; of galangals, an ounce and a half; of cardamoms and cubebs, of each one ounce. Bruise these ingredients, and digest them ten days in eleven gallons of proof spirit, and two gallons of water; after which add three pounds of cinnamon, and digest two days more; and then draw off ten gallons with a pretty brisk fire, and dulcify it to your palate with fine sugar.

This is an excellent cordial, of great use in faintings or sinking of the spirits, and to remove any sudden nauseas or sickness at the stomach.

CHAPTER XXX.

OF HEAVENLY WATER; OR, *AQUA CÆLESTIS.*

THIS water has its name from the great opinion its inventors had of it; but at present it is not so much called for as formerly.

RECEIPT FOR TEN GALLONS OF HEAVENLY WATER.

Take of cinnamon, mace, and cubebs, of each three ounces; ginger, one ounce and a half; cloves, galangal, nutmegs, and cardamoms, of each one ounce; zedoary, one ounce and a half; fennel seeds, one ounce; of the seeds of anise, wild carrot, and basil, of each half an ounce; roots of angelica, valerian, calamus aromaticus, leaves of thyme, calamint, pennyroyal, mint, mother of thyme, and marjorum, of each an ounce; flowers of red roses, sage, rosemary, and stæchas, of each six drachms; citron-peel an ounce: bruise all these ingredients and digest them three days in eleven gallons of proof spirit, and four gallons of water;

after which draw off ten gallons, with a pretty brisk fire; and dulcify the goods with fine sugar, adding ambergris and musk, of each three scruples.

The perfumes ordered to be added with the sugar, rendering the medicine offensive to some people, they may be omitted at pleasure. It is esteemed very efficacious in all nervous complaints, particularly palsies, loss of memory, and the like. In all decays of age, and languishing constitutions, it is exceeded by nothing in suddenly raising the spirits, and warming the blood.

CHAPTER XXXI.

OF SPIRITUOUS PENNYROYAL WATER.

THE plant from whence this water has its name has been already described, Chap. xiii. Part II.

RECEIPT FOR TEN GALLONS OF SPIRITUOUS PENNYROYAL WATER.

Take of the leaves of pennyroyal dried, fifteen pounds; proof spirit, ten gallons; water, two gallons: draw off ten gallons with a gentle fire.

This is a good carminative, of use in cholics

and gripings of the bowels; also in pleurisies and the jaundice; it is of known efficacy in promoting the menses and other disorders of the female sex.

CHAPTER XXXII.

OF COMPOUND PARSLEY WATER.

The plant from whence this water is denominated, is the common parsley of our gardens; an herb too well known to need description.

RECEIPT FOR TEN GALLONS OF COMPOUND PARSLEY WATER.

Take of parsley root, one pound and a quarter; fresh horse-radish root, and juniper berries, of each fifteen ounces; the tops of St John's wort, biting arsmart, and elder flowers, of each ten ounces; the seeds of wild carrot, sweet fennel, and parsley, of each seven ounces and a half; slice and bruise the ingredients, and digest them four days in eleven gallons of spirit and two gallons of water, after which draw off ten gallons.

This is a very good diuretic, frees the kidneys from sand and other matter, which often forms gravel and stones. It is also good in cholic pains,

arising from a stone in the bladder, and drains off all ill humours by urine.

CHAPTER XXXIII.

OF CARMINATIVE WATER.

THIS water has its name from its use, being an excellent carminative.

RECEIPT FOR TEN GALLONS OF CARMINATIVE WATER.

Take of fresh camomile flowers, four pounds; dill-seed, two pounds and a half; leaves of balm, origany, and thyme, of each one pound; seeds of anise and fennel, of each six ounces; cummin-seed, four ounces; peels of oranges and citrons, of each eight ounces; juniper and bay-berries, of each six ounces; cinnamon, eight ounces; mace, four ounces. Digest these ingredients, bruised, in eleven gallons of proof spirit, and two gallons of water; after which draw off ten gallons; and dulcify it with fine sugar.

This is an admirable carminative, and therefore good in all cholicky pains, and gripings of the bowels; and to remove sickness and nauseas from the stomach.

CHAPTER XXXIV.

OF GOUT WATER.

This water has also its name from its use, being of great service in that distemper.

RECEIPT FOR TEN GALLONS OF GOUT WATER.

Take of the flowers of camomile, leaves of pennyroyal, lavender, marjorum, rosemary, sage, and ground-pine, of each eight ounces; myrrh, four ounces; cloves and cinnamon, of each one ounce; roots of piony, two ounces; pellitory of Spain, and cypress orrice, of each one ounce; the lesser cardamoms and cubebs, of each half an ounce; nutmegs, two ounces. Cut and bruise these ingredients, and digest them four days in eleven gallons of proof spirit and two gallons of water; then draw off ten gallons; and dulcify with fine sugar.

This is a very good water in all nervous cases; and a continued moderate use of it will comfort and fortify the fibres, so as to prevent the discharge of such juices upon the joints as cause arthritic pains and swellings. It is also of excellent use in palsies, epilepsies, and loss of memory;

particularly when these distempers proceed from old age, or when the principal springs of life begin to decay.

CHAPTER XXXV.

OF ANHALT WATER.

This water is supposed to have been invented by a celebrated physician of Anhalt, a province of the circle of Upper Saxony.

RECEIPT FOR MAKING TEN GALLONS OF ANHALT WATER.

Take of the best turpentine a pound and a half; olibanum, three ounces; aloes wood powdered, one ounce; grains of mastick, cloves, July-flowers, or rosemary flowers, nutmegs, and cinnamon, of each two ounces and a half; saffron, one ounce: powder the whole, and digest them six days in eleven gallons of spirit of wine, adding two scruples of musk tied up in a rag; and draw off in *Balneum Mariæ* till it begins to run foul.

This water is a high aromatic cordial, invigorates the intestines, and thereby promotes digestion and dispels flatulencies. It is also in great

repute as a sovereign remedy for catarrhs and pains arising from colds; as also in palsies, epilepsies, apoplexies and lethargies, the parts affected being well rubbed with it.

CHAPTER XXXVI.

OF VULNERARY WATER, OR *EAU D'ARQUEBUSADE.*

THIS vulnerary water is greatly esteemed abroad; and, if properly tried, there is no doubt of its obtaining the same reputation here.

RECEIPT FOR FIVE GALLONS OF VULNERARY WATER.

Take of the leaves, flowers, and roots of comfrey, leaves of mugwort, sage, and bugle, of each eight handfuls; leaves of betony, sanicle, or ox-eye daisy, the greater figwort, plantain, agrimony, vervain, wormwood, and fennel, of each four handfuls; St John's wort, birth-wort, orpine, Paul's betony, the lesser centaury, yarrow, tobacco, mouse-ear, mint, and hyssop, of each two handfuls: cut them, bruise them well in a mortar, and pour on them three gallons of white wine, and two gallons and a half of proof spirit; digest the whole six days with a gentle heat, in a vessel close stopped; after which distil off with

a gentle fire, about five gallons, or till it begins to run milky from the worm.

This water is of excellent service in contusions, tumours attending dislocations, fractures, and mortifications, the part affected being bathed with it. Some also use it to deterge foul ulcers, and incarn wounds, from whence it was called vulnerary water.

CHAPTER XXXVII.

OF CEDRAT WATER.

The fruit called Cedrat by the French is a species of the citron, called by botanists *Citratum Florentinum, fructu mucronato et recurvo, cortice verrucoso odoratissimo*, Florentine citron, with a pointed fruit, which is recurved, and a warted sweet-smelling rind. This fruit is in so great esteem that they have been sold at Florence for two shillings each, and are often sent as presents to the courts of princes. It is only found in perfection in the plains between Pisa and Leghorn; and though the trees which produce this fruit have been transplanted into other parts of Italy, yet they are found to lose much of that excellent taste with which they abound in those parts.

RECEIPT FOR A GALLON OF CEDRAT WATER.

Take the yellow rinds of five cedrats, a gallon of fine proof spirit, and two quarts of water; digest the whole twenty-four hours in a vessel close stopped; after which draw off one gallon in *Balneum Mariæ*, and dulcify with fine loaf sugar.

This is esteemed the finest cordial yet known; but as it is very difficult to procure the fruit here, I shall give the method of making this celebrated cordial with the essence or essential oil of the cedrat, which is often imported from Italy.

RECEIPT FOR A GALLON OF CEDRAT WATER WITH THE ESSENCE OF THE FRUIT.

Take of the finest loaf sugar reduced to powder, a quarter of a pound; put it into a glass mortar with one hundred and twenty drops of the essence of cedrat; rub them together with a glass pestle; put them into a glass alembic with a gallon of fine proof spirits and a quart of water. Place the alembic in *Balneum Mariæ*, and draw off one gallon, or till the faints begin to rise; and dulcify with fine sugar.

You may make this water without distillation,

by mixing the essence with the sugar, as before directed, and dissolving it in the spirit and water directed as above. But the water will be foul and milky, and therefore you must filtrate it through paper, which will restore its brightness and transparency.

But whatever method is used, you must be very careful that the spirit be entirely freed from its essential oil; and therefore if your spirit be not very cleanly rectified, it will be advisable to use French brandy, lest the fine flavour so highly esteemed in this cordial be destroyed by the spirit.

CHAPTER XXXVIII.

OF BERGAMOT WATER.

The bergamot is a species of the citron, produced at first casually by an Italian's grafting a citron on the stock of a bergamot pear tree, whence the fruit produced by this union participated both of the citron tree and pear tree. The inventor is said to have kept the discovery a long time a secret, and enriched himself by it.

The bergamot is a very fine fruit both in taste

and smell; and its essence or essential oil highly esteemed.

RECEIPT FOR A GALLON OF BERGAMOT WATER.

Take the outer rind of three bergamots, a gallon of proof spirit, and two quarts of water. Draw off one gallon of it in *Balneum Mariæ*, and dulcify it with fine sugar.

If you make your bergamot water from the essence or essential oil, observe the same directions as given in the preceding chapter for making cedrat water. One hundred and sixty drops of the essence will be sufficient for a gallon of spirit, and so in proportion for a greater or smaller quantity.

CHAPTER XXXIX.

OF ORANGE CORDIAL WATER, OR *EAU DE BIGARADE.*

The orange, called by the French *Bigarade*, is called by botanists *Aurantium maximum, verrucoso cortice*, the large warted orange.

It is a large and beautiful fruit, and greatly esteemed for the fragrancy of its essence. It is

common in diverse parts of Italy, Spain, and Provence in France.

RECEIPT FOR MAKING A GALLON OF ORANGE CORDIAL.

Take the outer or yellow part of the rinds of fourteen bigarades; half an ounce of nutmegs; a quarter of an ounce of mace; a gallon of fine proof spirit, and two quarts of water. Digest all these together two days in a close vessel; after which draw off a gallon with a gentle fire, and dulcify with fine sugar.

This cordial is greatly esteemed abroad, and would be the same here if sufficiently known.

If the orange peels are not easily procured, one hundred and forty drops of the essence may be used in their stead, and the water will be nearly equal to that made from the peels.

CHAPTER XL.

OF JASMINE WATER.

THERE are several species of jasmine; but that sort intended here is what the gardeners call

Spanish white, or Catalonian jasmine. This is one of the most beautiful of all the species of jasmine; the flowers much larger than any of the others, of a red colour on the outside, and extremely fragrant. But if the flowers of this species cannot be procured, those of the common sort may be used; but the quantity must be considerably augmented.

RECEIPT FOR A GALLON OF JASMINE WATER.

Take of Spanish jasmine flowers twelve ounces; essence of Florentine citron, or bergamot, eight drops; fine proof spirit a gallon, water two quarts. Digest two days in a close vessel; after which draw off one gallon, and dulcify with fine loaf sugar.

This is a most excellent cordial, and deserves to be more known here than it is at present.

CHAPTER XLI.

OF THE CORDIAL WATERS OF MONTPELIER.

This water has its name from the place where it was first made; and what is now brought from thence is still in great reputation.

RECEIPT FOR A GALLON OF THE CORDIAL WATER OF MONTPELIER.

Take of the yellow rinds of two bergamots, or fifty drops of the essence of that fruit; cloves and mace, of each half an ounce; proof spirit a gallon; water one quart. Digest two days in a close vessel, draw off a gallon, and dulcify with fine sugar.

CHAPTER XLII.

OF FATHER ANDREW'S WATER.

This water has its name from its inventor; and is greatly esteemed in France.

RECEIPT FOR A GALLON OF FATHER ANDREW'S WATER.

Take of white lily flowers eight handfuls; orange flowers, four ounces; rose water, a quart; proof spirit, a gallon; water, a quart: draw off a gallon in *Balneum Mariæ*, and dulcify with fine sugar.

CHAPTER XLIII.

OF THE WATER OF FATHER BARNABAS.

THIS water has also its name from its inventor, a jesuit of Paris.

RECEIPT FOR A GALLON OF THE WATER OF FATHER BARNABAS.

Take of the roots of angelica four ounces; of cinnamon and orrice root, of each half an ounce: bruise these ingredients in a mortar; put them into an alembic, with a gallon of proof spirit and two quarts of water: draw off a gallon with a pretty brisk fire.

CHAPTER XLIV.

OF THE WATER OF THE FOUR FRUITS.

THIS water has its name from the four fruits in its composition; namely, the cedrat or Florentine citron, the bergamot, the common citron, and the Portugal orange.

RECEIPT FOR A GALLON OF THE WATER OF THE FOUR FRUITS.

Take of the essence of cedrat fifty drops; of the essence of bergamot thirty-six drops; of the essence of citron sixty drops; and of the essence of Portugal orange sixty-four drops; fine proof spirit one gallon; water two quarts: draw off with a pretty brisk fire till the faints begin to rise, and dulcify with fine sugar.

This is a very pleasant and odoriferous cordial, and in great esteem in France.

CHAPTER XLV.

OF THE WATER OF THE FOUR SPICES.

THIS water also derives its name from the four spices from whence it is drawn, viz. cloves, mace, nutmegs, and cinnamon.

RECEIPT FOR A GALLON OF THE WATER OF THE FOUR SPICES.

Take of cinnamon two ounces; nutmegs and cloves, of each three drams; mace six drams:

bruise the spices in a mortar, and add proof spirit a gallon, and water two quarts. Digest twenty-four hours in a close vessel, and distil with a brisk fire till the faints begin to rise; and dulcify with fine sugar.

This is an excellent stomachic, good in all depressions of the spirits, and paralytic disorders.

CHAPTER XLVI.

OF THE WATER OF THE FOUR SEEDS.

THIS water has its name from the four seeds from whence it is drawn, viz. the seeds of sweet fennel, coriander, angelica, and anise.

RECEIPT FOR TEN GALLONS OF THE WATER OF THE FOUR SEEDS.

Take of sweet fennel seed seven ounces; coriander seed, nine ounces; of the seeds of angelica and anise, of each three ounces: bruise all these in a mortar, and put them into the still, with ten gallons and a half of proof spirits, and two gallons of water: draw off with a gentle fire till the faints begin to rise, and dulcify with fine sugar.

This water is a very good carminative, good in cholics, nauseas of the stomach, and gripings of the bowels.

CHAPTER XLVII.

OF THE DIVINE WATER.

THIS is one of those waters whose names have rendered them famous. The basis of this water is orange flowers, the other ingredients being added to diversify the flavour, and render it more agreeable.

RECEIPT FOR A GALLON OF DIVINE WATER.

Take of orange flowers fresh gathered, two pounds; coriander seed, three ounces; nutmegs, half an ounce: bruise the nutmegs and coriander seed, and put them, together with the orange flowers, into an alembic with a gallon of proof spirit, and two quarts of water: draw off the liquor with a gentle fire, till the faints begin to rise, and dulcify with fine sugar.

This is a very pleasant cordial, both with regard to its smell and taste; and on that account in great esteem abroad.

CHAPTER XLVIII.

OF ROMAN WATER.

THIS water has its name from its being made first at Rome; and from whence great quantities are still exported to different parts of Europe.

RECEIPT FOR A GALLON OF ROMAN WATER.

Take the outer or yellow peels of six citrons; two drams of mace bruised; a gallon of proof spirit and two quarts of water: draw off with a gentle fire till the faints begin to rise, and dulcify with fine sugar.

This water is generally of a red or purple colour, the former of which may be easily given by infusing in it a few grains of cochineal, or the red parts of clove July-flower; and the latter, by adding to the above a few violets. When the colour is extracted, run the liquor through the filtrating bag, and it will be very bright and clear.

CHAPTER XLIX.

OF BARBADOES WATER.

THERE is a great variety of waters called by this name, made by foreign distillers; but the following receipts will be sufficient to shew the distiller the method of making them, and how to vary the flavour of his waters, so as to adapt them to the taste of his customers.

RECEIPT FOR A GALLON OF RECTIFIED BARBADOES WATER.

Take the outer rind of eight large Florentine citrons; half an ounce of cinnamon bruised; and a gallon of rectified spirit. Distil to a dryness in *Balneum Mariæ*. Then dissolve two pounds of sugar in a quart of water, and mix it with the distilled liquor, and run it through the filtrating bag, which will render it bright and fine.

RECEIPT FOR MAKING A GALLON OF AMBER-COLOURED BARBADOES WATER.

Take the yellow rind of six bergamots, half an ounce of cinnamon, and two drams of cloves.

Bruise the spices, and digest the whole six days in a gallon of rectified spirit; and then add a dram of saffron, and let the whole stand six days longer in digestion: dissolve two pounds of fine sugar in a quart of water, add it to the tincture, and run it through the filtrating bag.

After the same manner may be made Barbadoes waters of different kinds, by adding lemon or orange peels, instead of those of citron or bergamot; or, by varying the spices.

CHAPTER L.

OF ROS SOLIS.

THE ros solis, or sun-dew, from whence this cordial water has its name, is a small low plant, with a fibrous root, from whence spring small round hollowish leaves, on foot-stalks about an inch long, covered and fringed with short red hairs, which give a red cast to the whole leaf. It grows in champaign and mossy grounds, in a pale red moss, and flowers in May.

RECEIPT FOR TEN GALLONS OF ROS SOLIS.

Take of ros solis, picked clean, four pounds;

cinnamon, cloves, and nutmegs, of each three ounces and a half; marigold flowers, one pound; caraway seeds, ten ounces; proof spirit, ten gallons; and of water, three gallons. Distil with a pretty brisk fire, till the faints begin to rise. Then take of liquorice root sliced half a pound; raisins stoned two pounds; red saunders half a pound: digest these three days in two quarts of water, and strain out the clear liquor, in which dissolve three pounds of fine sugar, and mix it with the spirit drawn by distillation.

RECEIPT FOR MAKING TEN GALLONS OF ROS SOLIS BY DIGESTION.

Take of ros solis clean picked three pounds; nutmegs, mace, cloves, and cinnamon, the seeds of caraway and coriander, of each three ounces; ginger, the lesser cardamom, zedoary, and calamus aromaticus, of each one ounce; cubebs and yellow saunders, of each half an ounce; red saunders, three ounces; red rose leaves dried, three handfuls; proof spirit, ten gallons: digest the whole six days in a vessel close stopped, and then strain off the clear liquor, and dulcify it with fine sugar. Or,

Take of ros solis picked three pounds; cinna-

mon and nutmegs, caraway and coriander seeds, of each three ounces; cloves, mace, and ginger, of each one ounce and a quarter; cubebs, cardamoms, zedoary, and calamus aromaticus, of each half an ounce; red roses dried three ounces; liquorice root sliced six ounces; raisins stoned one pound and a half; cochineal and saffron, of each three drams: digest the whole eight days in ten gallons of proof spirits; strain off, and dulcify as before.

RECEIPT FOR TEN GALLONS OF TURIN ROS SOLIS.

Take of damask roses, orange flowers, lilies of the valley, and jasmine flowers, of each two pounds and a half; cinnamon five ounces; cloves three drams: put these ingredients into an alembic, with four gallons and a half of water, and draw off three gallons with a moderate fire; to this water add seven gallons of proof spirit, in which a dram of cochineal and two drams of saffron have been infused; dulcify with fine sugar, and run the whole through the filtrating bag.

All these different kinds of ros solis are excellent cordials, good in all depressions of the spirits, nauseas, and paralytic disorders.

CHAPTER LI.

OF USQUEBAUGH.*

USQUEBAUGH is a very celebrated cordial, the basis of which is saffron. There are different ways of making this famous compound; but the following are equal to any I have seen.

RECEIPT FOR TEN GALLONS OF COMMON USQUEBAUGH.

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

RECEIPT FOR MAKING TEN GALLONS OF ROYAL USQUEBAUGH.

Take of cinnamon, ginger, and coriander seed, of each three ounces; nutmegs, four ounces and a half; mace, cloves, and cubebs, of each one ounce and a half: bruise these ingredients, and put them into an alembic with eleven gallons of proof spirit, and two gallons of water; and distil till the faints begin to rise, fastening four ounces and a half of English saffron tied in a cloth to the end of the worm, as directed in the preceding receipt. Take raisins stoned, four pounds and a half; dates, three pounds; liquorice root sliced, two pounds: digest these twelve hours in two gallons of water; strain out the clear liquor, add it to that obtained by distillation, and dulcify the whole with fine sugar.

RECEIPT FOR TEN GALLONS OF USQUEBAUGH BY DIGESTION.

Take of raisins stoned, five pounds; figs sliced, one pound and a half; cinnamon, half a pound; nutmegs, three ounces; cloves and mace, of each one ounce and a half; liquorice, two pounds; saffron, four ounces: bruise the spices, slice the

liquorice, and pull the saffron in pieces: digest these ingredients eight days in ten gallons of proof spirit, in a vessel close stopped; then filter the liquor, and add to it two gallons of Canary wine, and half an ounce of the tincture of ambergris.

RECEIPT FOR MAKING TEN GALLONS OF FRENCH USQUEBAUGH.

Take of saffron three ounces: of the essential oil or essence of Florentine citron, bergamot, Portugal orange, and lemon, of each a hundred drops; angelica seed, vanellos, and mace, of each one ounce and a half; cloves and coriander seed, of each three quarters of an ounce: bruise the seeds and spices, and put all into an alembic with eleven gallons of proof spirit and two gallons of water; and draw off with a gentle fire till the faints begin to rise, fastening to the nose of the worm four ounces of saffron in a cloth. When the operation is finished, dulcify the goods with fine sugar.

These waters are excellent cephalic cordials and alexipharmics; and are excelled by nothing in suddenly reviving the spirits when depressed by sickness, &c.

CHAPTER LII.

OF RATAFIA.

RATAFIA is a liquor in great esteem, and most persons are acquainted with it; though the true method of making it is known only to a few. There are various kinds of ratafia made from different fruits. I shall give receipts for making those which are at present in most esteem; which may serve as examples for making these goods from any other kinds of fruit.

OF RED RATAFIA.

There are three sorts of ratafia drawn from red fruits, distinguished by the epithets, *fine*, *dry*, and *common*.

The fruits most proper to make the red ratafia, are the black heart cherry, the common red cherry, the black cherry, the merry or honey cherry, the strawberry, the raspberry, the red gooseberry, and the mulberry.

These fruits should be gathered in the height of their respective seasons, and the largest and most beautiful of them chosen for that purpose.

Thus, with regard to the heart cherry, it should be large, fleshy, and thorough but not over ripe, for then a part of its juice will be evaporated on the tree; care must be also taken that its colour be not decayed, but clear and almost transparent, and well tasted.

The black cherry, or, as it is often called, the black arvon, must be extremely ripe, because it is used to colour the ratafia when that of the other fails. The criterion of judging when it is thoroughly ripe, is its blackness; for, when in perfection, it is perfectly black. It should also be remembered, that this fruit is better and more profitable in proportion to its sweetness; as the flavour of the ratafia will be rendered more agreeable, and a less quantity of sugar necessary.

As the gooseberry is an acid fruit, it must be chosen as ripe as possible; the fruit large, and the skin and husk so transparent as to see the seeds through it. The gooseberry should be used immediately after its being gathered; for it is very liable to ferment, which will inevitably spoil the ratafia. Gooseberries are chiefly used to render the ratafia dry or sharp, and consequently less soft; and therefore their quantity should always be proportioned to that intention.

The merry cherry, to be good, should be small, black, the skin transparent, full of liquor, of deep black purple colour. The greatest care should be taken that it be fresh gathered, and not rotten. It corrects the acid juices of the other fruits by its sweetness, softens the composition, and is of great service in colouring the ratafia.

The mulberry is of the greatest service in colouring the ratafia. It should be chosen large, and fully ripe, at which time it is of a black purple colour. Its taste also greatly contributes to render the ratafia of a pleasant and agreeable flavour.

The strawberry greatly contributes to increase the rich flavour of the ratafia; but it must be chosen ripe, and large, fresh gathered, and not bruised. Another caution necessary to this fruit is, that they are gathered in dry warm weather; for if gathered in rainy weather, they will want that fine taste for which they are so greatly valued.

The raspberry is also added to augment the richness of the liquor, to which its elegant perfumy taste greatly contributes; by its agreeable acidity it renders the flavour more brisk and agreeable. It must be fresh gathered, full ripe, and free from

spots and mouldiness, which the fruit is particularly subject to.

Having thus concisely enumerated the qualities requisite in the several fruits, to render the ratafia of a rich and elegant flavour, we shall proceed to give the best methods for making ratafia from them.

RECEIPT FOR MAKING RED RATAFIA, FINE AND SOFT.

Take of the black heart cherries twenty-four pounds; black cherries, four pounds; raspberries and strawberries, of each three pounds; pick these fruits from their stalks, and bruise them, in which condition let them continue twelve hours; press out the juice, and to every pint of it add a quarter of a pound of sugar. When the sugar is dissolved, run the whole through the filtrating bag, and add to it three quarts of clean proof spirits. Then take of cinnamon four ounces; of mace an ounce; and of cloves two drachms. Bruise these spices; put them into an alembic with a gallon of clean proof spirits, and two quarts of water, and draw off a gallon with a brisk fire. Add as much of this spicy spirit to your ratafia as will render it

agreeable to your palate; about one-fourth is the usual proportion.

Ratafia, made according to the above receipt, will he of a very rich flavour, and elegant colour. It may be rendered more or less of a spicy flavour, by adding or diminishing the quantity of spirit distilled from the spices.

Some, in making ratafia, suffer the expressed juices of their fruits to ferment several days: by this means the vinosity of the ratafia is increased; but, at the same time, the elegant flavour of the fruits greatly diminished. Wherefore, if the ratafia be desired stronger or more vinous, it may be done by adding more spirits to the expressed juice; by which means the flavour of the fruits may be preserved, as well as the ratafia rendered stronger.

It is also a method with some to tie the spices in a linen rag, and suspend them in the ratafia. But if this method be taken, it will be necessary to augment the quantity of spirit first added to the expressed juice. There is no great difference in the two methods of adding the spices, except that, by suspending them in the ratafia,

the liquor is generally rendered less bright and transparent.

There is also another method practised in making ratafia, which is this: take the quantity of fruit proposed, bruise it, and immediately pour the spirit on the pulp. After standing a day or two, express the juice and spirit, filtrate it, and add the sugar and spices as before. But this method requires more spirit than the former, as it will be impossible to press it all out of the skins, and other parts of the fruit remaining, after the juice is extracted.

OF MAKING FINE AND DRY RATAFIA FROM RED FRUIT.

Though the ratafia we have just mentioned will doubtless please the palates of many people, yet there are others who would prefer a different sort; it is therefore necessary to know how to make dry as well as sweet ratafia, if we are desirous of pleasing all sorts of palates.

Dry ratafia is prepared in the same manner as the preceding, but the ingredients are different.

An equal quantity of cherries and gooseberries

are necessary in making dry or sharp ratafia; because the acidity of the gooseberries gives the requisite flavour to this sort of liquor. But, at the same time, care must be taken that the gooseberries be fully ripe; for otherwise, though gooseberries are more acid before they are ripe than afterwards, yet that acidity is not the flavour desired; it is acerb and rough, and will render the flavour of the ratafia disagreeable. The same observation holds good also with regard to the cherries; they must be fully ripe as in making the soft ratafia.

Instead of black cherries used in the composition of the preceding ratafia, mulberries should be used in this: the reason for this change is, that the juice of the black cherry is more sweet and glutinous than that of the mulberry, and therefore less fit for making the ratafia. But the mulberries must be the ripest and blackest possible, in order to give the better colour to the liquor.

More spirit and less sugar, in proportion to the juice of the fruit, is also required in this composition than in the foregoing; but with regard to the spices, the same quantity is generally added to both.

RECEIPT FOR MAKING RED RATAFIA, FINE AND DRY.

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

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

OF MIXED RATAFIA.

By mixed ratafia is meant the juices of fruits prepared, and ready to be mixed with the spirit when called for.

RECEIPT FOR MAKING MIXED RATAFIA.

Ratafia is composed of cherries and gooseberries; of these the best are to be chosen, bruised, and in that condition suffered to remain some days to ferment. The juice is then to be strained off, the quantity of sugar and brandy added, and the whole put into a cask, and close stopped. A lee or sediment will fall to the bottom of the cask, which sediment will he of great use in preserving the ratafia.

The proportion of black cherries must be large in this ratafia, because the colour, which this is greatly valued for, chiefly comes from the juice of that fruit.

The sugar must not be put in at once, because the acidness of the liquor would cause a considerable effervescence, but by a little at a time.

These instructions being observed, a ratafia of this kind may be easily made; and as the spirit is not to be mixed with it till the ratafia is called for, a large quantity of it may be made at a small expense, when the fruits are in perfection, which cannot be done by the common methods.

RECEIPT FOR MAKING MIXED RATAFIA.

Take of common cherries, thoroughly ripe, four hundred and fifty pounds; gooseberries, large and ripe, two hundred and twenty-five pounds; black cherries, ripe and large, fifty pounds. Bruise these fruits, and in that condition let them continue three or four days to ferment: then press out the juice, and add one-fifth part of spirit; that is, if you have two hundred and fifty pints of juice, you must add to it fifty pints of spirit. When your spirit and juice are mixed, put them into a cask, and for every pint add three ounces of sugar. By this means your ratafia will be always ready to mix with spirit.

But as the proportion of spirit is but small, it will be necessary to taste your ratafia at least every month, lest it should ferment, and by that means lose both its flavour and colour. As soon, therefore, as you perceive the least alteration in your ratafia, more spirit must be added to stop the fermentation; and by this method it may be kept the whole year.

If you have any ratafia remaining at the end of the year, you must mix it with that just made, adding a large proportion of black cherries;

because the colour in the old ratafia will not be equal to that of the new. Or you may add to your old ratafia a proper quantity of the fresh juice of black cherries, which will restore its colour, and, in a great measure, its flavour too: so that if your ratafia has been well preserved, it will, when mixed with fresh juice of black cherries, be but little inferior to the new.

OF WHITE RATAFIA.

As red fruits are the basis of that called red ratafia, so, on the contrary, that made from the juices of white fruits is denominated white ratafia.

There are various kinds of ratafia made from various fruits; but I shall only give receipts for making three or four sorts, which will be sufficient for all the rest, as the method is nearly the same in all.

RECEIPT FOR MAKING RATAFIA FROM THE MUSCAT OR WHITE FRONTINIAC GRAPE.

The berries of this kind of grape are large, and grow extremely close upon the bunches, which are very long, and have commonly two shoulders; the fruit, when ripe, has a rich musky flavour;

but it is commonly very late in autumn before these grapes are in perfection; and the berries being so very close upon the bunches, detain the moisture in the centre; so that they often perish: to prevent which, some curious persons look over their vines soon after the grapes are formed, and, with a pair of scissars, cut out all small ones, so as to leave the others at a moderate distance, whereby the sun and air are easily admitted, which dissipates the moisture, and prevents their perishing. There is another kind of this grape, called by some the white frontiniac of Alexandria, and by others the Jerusalem muscat, which is a very large grape, and, when ripe, an excellent fruit; but is rarely brought to perfection in England. The berries of the Jerusalem muscat are of an oval shape, and very large. They grow very loose on the bunches, are very fleshy and firm, and, when ripe, are of a greenish-white, and a delicate flavour.

Either of these kind of grapes will make very fine ratafia; but whichever of them are chosen, they must be picked from the stalks, and only the finest berries made use of. The stones must also be picked out; for if they are bruised with the berries, the fine flavour of the juice will be greatly diminished.

When you have picked the grapes from the stalks, and taken out the stones, press out the juice, and filtrate it through a flannel bag. Then add the quantity of sugar and spirit, and flavour it to your mind, with a spirit distilled from spices, in the manner explained below.

The general proportion of sugar and spirit is, to twenty pints of the juice, five pounds and a half of sugar, ten pints of spirit, and what quantity you please of the spicy spirit.

To make the spicy spirit, take of mace one pound, nutmegs four ounces, spirit three gallons, and draw off the whole in *Balneum Mariæ*.

By the same method you may make red ratafia from the red frontiniac; except that the grapes, when bruised, must be suffered to ferment three or four days before the juice is pressed out; because the colour, which resides principally in the skins of the grapes, will, by that means, be extracted.

The berries of the red muscat, or red frontiniac, are about the size of those of the white, but grow much thinner on the bunches. This grape, when thoroughly ripe, has the richest and

highest flavour of any yet known; but it must have a dry soil and a south aspect, otherwise it seldom ripens well in England. Besides the above grape, there is another, called by some red muscat of Alexandria, and by others, red Jerusalem muscat. This is not quite so late in ripening as the white muscat of Alexandria above described; and for that reason more esteemed. The berries of this kind are not quite so large as those of the white, but of the same form, and equal in goodness.

OF RATAFIA FROM PEACHES.

The ratafia made from the peach has the finest and richest flavour of any made from stoned fruits. It is, however, necessary to gather the peach when thoroughly ripe, but, at the same time, not to suffer it to hang too long on the tree: for as, on the one hand, it will not acquire its delicious flavour and smell till thoroughly ripe, so, on the other, it will lose both if suffered to hang on the tree after it has attained to a full maturity. Another necessary caution is to gather it in fine warm weather, and near the middle of the day; because then both the flavour and smell are in the greatest perfection.

It is also requisite to make choice of the proper sorts of peaches; for there is a remarkable difference in the flavour of these fruits. Gardeners reckon above thirty sorts of peaches; but not more than half that number are proper for making ratafia. I shall therefore give a short description of those that are most proper, that the young distiller may not be disappointed in making ratafia from peaches.

1. The early purple, (called by the French *La Pourprée Hâtive*). This tree has smooth leaves; the flowers large and open: the fruit is large, round, and of a fine red colour; the flesh is white, but very red at the stone; very full of juice, which has a rich vinous flavour. This peach is ripe about the middle of August.

2. The large, or French mignon. The leaves of this tree are smooth, and the flowers large and open. The fruit is a little oblong, generally swelling out on one side, and of a fine colour. The juice is very sweet, and of a high flavour; the flesh white, but very red at the stone, which is small, and easily separates from the flesh. This peach is ripe in the middle of August.

3. The chevreuse, or belle chevreuse. This

tree has smooth leaves, and its flowers are small and contracted. The fruit is of a middling size, a little oblong, and of an elegant colour. The flesh is white, but very red at the stone, from which it separates; full of a rich sugary juice, and ripens towards the latter end of August.

4. The red magdalen, called by the French about Paris, *Magdeleine de Courson*. The leaves of this tree are deeply sawed, and the flowers large and open. The fruit is large, round, and of a fine red colour. The flesh is white, but very red at the stone, from which it separates. The juice is very sugary, and of a rich flavour. It is ripe the latter end of August.

5. Smith's Newington. This tree has sawed leaves, and large open flowers. The fruit is of a middling size, and of a fine red next the sun. The flesh is very firm and white, but very red at the stone, to which it closely adheres. It has a rich sugary juice, and is ripe the latter end of August.

6. The chancellor. The leaves of this tree are smooth, and the flowers small and contracted. The fruit is shaped somewhat like the belle chevreuse, but rounder. The flesh is white and

melting, and separates from the stone, where it is of a fine red colour. The skin is very thin, and the juice remarkably rich. It ripens about the end of August.

7. The bellegarde, or, as the French call it, the *Gallande*. This tree has narrow leaves, and small contracted flowers. The fruit is very large and round, and of a deep purple colour on the side exposed to the sun. The flesh is white, melting, and separates from the stone, where it is of a deep red colour. The juice is very rich. This peach is ripe about the beginning of September.

8. The bourdine. The leaves of this tree are smooth, and the flowers small and contracted. The fruit is large, round, and of a fine red colour next the sun. The flesh is white, melting, and separates from the stone, where it is of a fine red colour. The juice is vinous and rich. It is ripe the beginning of September, and greatly esteemed by the curious.

9. The Lisle, or, as the French call it, *La petite Violette Hâtive*. This tree has smooth leaves, and small contracted flowers. The fruit is of a middle size, and next the sun of a fine violet

colour. The flesh is of a pale yellow, melting, full of a rich vinous juice; but adheres to the stone, where it is very red. This fruit is ripe the beginning of September.

10. The old Newington. The leaves of this tree are sawed, and the flowers large and open. The fruit is fair, large, and of a beautiful colour next the sun. The flesh is white, melting, and closely adheres to the stone, where it is of a deep red colour. The juice is very rich and vinous. It ripens about the middle of September.

11. The Rambouillet, commonly called the rambullion. This tree has smooth leaves, and large open flowers. The fruit is of a middling size, rather round than long, deeply divided by a furrow in the middle; of a fine red colour next the sun, but of a light yellow next the wall. The flesh is melting, of a bright yellow colour, except near the stone, from which it separates, where it is of a deep red. The juice is rich and of a vinous flavour. This fruit ripens about the middle of September.

12. The pourprée, or, as the French generally call it, *Pourprée tardive*, the late purple. The leaves of this tree are very large and sawed, the

shoots strong, and the flowers small and contracted. The flesh, except near the stone, from which it separates, and where it is red, is white, melting, and of a rich sugary juice. It is not ripe till near the end of September.

13. The nevette. The leaves of this tree are sawed, and the flowers small and contracted. The fruit is large, somewhat longer than round, of a bright red colour next the sun, and of a pale yellow on the other. The flesh is melting, full of a rich juice, and very red at the stone, from which it separates. It ripens about the middle of September, and is esteemed one of the best peaches.

14. The royal. This tree has smooth leaves, and small contracted flowers. The fruit is large, round, and of a deep red on the side exposed to the sun, but of a pale yellow on the other. The flesh is white, melting, and full of a rich juice, of a white colour, except near the stone, from which it separates, where it is of a deep red. This fruit is ripe about the middle of September.

15. The monstrous pavy of pomponne. The leaves of this tree are smooth, the flowers large and open. The fruit is very large and round,

many times fourteen inches in circumference. The flesh is white, melting, and closely adheres to the stone, where it is of a deep red colour. The side next the sun is a beautiful red, and the other of a pale flesh colour. It ripens about the end of October, and, when the autumn is warm, is an excellent peach.

The above description of the different kinds of peaches proper for making ratafia, will be of use to the young artist, as the fine flavour of this liquor in a great measure depends on a proper choice of the fruits used in the composition; and if the instructions relating to the perfections and ripeness of these fruits are observed, an excellent cordial may be easily made in the following manner:—

Take your peaches, bruise them, and instantly strain out their juice through a piece of strong linen. In this juice, without any mixture of water, dissolve your sugar; and when the sugar is melted, add the quantity of spirit. No spices must be used in this ratafia, the fine flavour of the peach being far preferable to all spices in the world. The quantity of either the sugar or spirit may be augmented or lessened according to your

own judgment, or in proportion to the price of your ratafia.

As soon as the spirit is added to the dulcified juice of the peaches, the whole must be filtrated through a flannel bag, put into bottles close stopped; for the fine flavour of the peach will soon be lost, unless the bottles are very well corked. Some also cover the cork with sealing-wax, which is not a bad caution.

If you would have your ratafia of a bright red colour, you must let your bruised peaches ferment a day or two; by which means the colour of the skin, and that of the flesh near the stone, will be extracted, and give your ratafia the colour desired.

OF ORANGE FLOWER RATAFIA.

The orange flower has been already described, page 128. I shall therefore only add, that the orange flowers used in making ratafia should be large, in their full perfection, gathered before the rising of the sun, and carefully picked from their stalks, &c. Some blanch the orange flowers, by putting them into a small quantity of water, and boiling them a few minutes over the fire. But

by this method the most volatile parts of the flower are evaporated, by which the ratafia will lose much of its delicate flavour.

The best way, therefore, is to use the orange flowers without any previous boiling.

RECEIPT FOR MAKING TEN GALLONS OF ORANGE FLOWER RATAFIA.

Take of orange flowers, fresh gathered, and clean picked from their stalks, &c. five pounds, and infuse them six days in five gallons of clean proof spirit. Dissolve fourteen pounds of sugar in five gallons of water; and after straining the spirit from the flowers, mix it with the syrup, and filtrate the whole through a flannel bag.

Some instead of common water use the orange flower water; but it will be necessary in pursuing that method to take care that the water be fresh made, and very fragrant; for otherwise, instead of improving, you will greatly injure the fine flavour of your ratafia.

The foreign distillers keep two sorts of orange flower ratafia, one they call *single*, and the other *double*. The former is made according to the

above receipt; but in making the latter, they use double the quantity of orange flowers, and considerably augment the proportion of sugar. It will be needless to give a receipt for making that sort of ratafia which they call *double*, as the process is exactly the same.

RATAFIA OF 'ORTUGAL ORANGE.

Ratafia may be made from any sort of orange; but that of the Portugal orange is reckoned the best.

The oranges must be chosen fair, large, and ripe; and the outer or yellow peel be carefully taken off. The juice of the oranges must be then pressed out, dulcified with sugar, and mixed with the spirit: after which the outer rinds are to be added, and, after a proper infusion, the whole filtrated through a flannel bag.

RECEIPT FOR MAKING THREE GALLONS OF PORTUGAL ORANGE RATAFIA.

Take of the juice of Portugal oranges, two gallons; clean rectified spirit, one gallon; four pounds of sugar; and the outer peel of ten

oranges. Let the whole infuse a fortnight, and then filter the liquor through a flannel bag.

Some, instead of infusing the peel as directed in the above receipt, put the peel into the spirit, and distil it in *Balneum Mariæ;* after which they add the spirit to the dulcified orange juice, and filtrate it as before.

The foregoing receipts for making ratafia from different fruits, &c. will be sufficient to instruct the young distiller in the method necessary to be pursued for making cordials of this kind; for it would be tedious to give formulas for making all kinds of ratafia kept by different distillers. The method in all is nearly the same; and the proportion of sugar and spirit may be easily discovered by a few experiments. I shall therefore conclude this chapter with giving a receipt for making what is called by our English distillers ratafia, though a very bad composition.

RECEIPT FOR MAKING TEN GALLONS OF COMMON RATAFIA.

Take of nutmegs, eight ounces; bitter almonds, ten pounds; Lisbon sugar, eight pounds; ambergris, ten grains: infuse these ingredients three

days in ten gallons of clean proof spirit, and filter through a flannel bag for use.

The nutmegs and bitter almonds must be bruised; and the ambergris rubbed with the Lisbon sugar in a marble mortar, before they are infused in the spirit.

CHAPTER LIII.

OF GOLD CORDIAL.

This cordial has its name from leaf gold being formerly used in its composition; but as latter experiments have abundantly demonstrated that gold can add nothing to its virtues, it is now generally omitted.

RECEIPT FOR MAKING TEN GALLONS OF GOLD CORDIAL.

Take of the roots of angelica, four pounds; raisins stoned, two pounds; coriander seeds, half a pound; caraway seeds and cinnamon, of each half a pound; cloves, two ounces; figs and liquorice root, of each one pound; proof spirit, eleven gallons; water, two gallons: the angelica, liquo-

rice, and figs, must be sliced before they are added. Digest two days, and draw off by gentle heat till the faints begin to rise, hanging in a piece of linen fastened to the mouth of the worm an ounce of English saffron. Then dissolve eight pounds of sugar in three quarts of rose water, and add it to the distilled liquor. Some distillers, instead of saffron, colour their goods with burnt sugar, but by this means the cordial is greatly impaired in its virtues. Or,

Take of the juice of alchermes, five ounces; cloves, two ounces and a half; musk and ambergris, of each half a drachm; loaf sugar, ten pounds; proof spirit, eleven gallons: digest the whole a fortnight in a close vessel, and filter through a flannel bag for use. Some add thirty leaves of gold; but the medicine is not at all the better for it.

Either of the above receipts will produce an excellent cordial; good in tremblings, faintings, and lowness of spirits, &c. also in nauseas and griping pains of the stomach and bowels.

CHAPTER LIV.

OF CARDAMOM, OR ALL-FOURS.

This water has its name from the four ingredients in its composition; and in some countries is greatly used by the poorer sort of people.

RECEIPT FOR MAKING TEN GALLONS OF CARDAMOM.

Take of pimento, caraway, and coriander seeds, and lemon peel, of each three pounds; of malt spirits, eleven gallons; water, three gallons. Draw off with a gentle fire, dulcify with ordinary sugar, and make up the goods to the strength you desire, with clean water.

This is rarely called for, unless by the poor sort of people, who are induced to use it from its cheapness; though it is a better cordial than many drawn from dearer ingredients. It is an excellent carminative, and is often sold for *aqua mirabilis*.

CHAPTER LV.

OF GENEVA.

THERE was formerly kept in the apothecaries' shops a distilled spirituous water of juniper; but the vulgar being fond of it as a dram, the distillers supplanted the apothecaries, and sold it under the name of geneva. The common sort, however, is not made from juniper berries, as it ought to be, but from oil of turpentine; the method of which we shall give in the sequel of this chapter.

Juniper berries are a roundish fruit, of the size of a pea. They wither and wrinkle in the drying, and we meet with them variously corrugated, and usually covered with a bluish resinous dust when fresh. They should be chosen fresh, plump, full of pulp, and of a strong taste and smell. They are usually imported from Germany, though we have plenty of the trees in England. It is but small with us, rarely rising to more than three or four feet in height, and scarce ever exceeding five or six. Some of the juniper shrubs are males, some females, of the same species: the male shrubs produce in April or May a small

kind of juli with apices on them, very large, and full of farina; the females produce none of the juli, but only the berries, which do not ripen till the second year, and then do not immediately fall off, so that it is no uncommon thing to see three sets of berries, or the berries of three different years at once on the same tree.

If you make use of English berries, let them be fully ripe before they are gathered; and in order to preserve them, spread them very thin on a boarded floor, leaving the windows and doors open, and turn them once a-day till they are dry, after which pack them up in barrels, so that no air may come to them, and they will keep good all the year. Some, when they are dry, throw them altogether in a heap in a corner of the room, where they continue till wanted for use: but the berries will not keep so well by this method, as by being packed in casks; they are subject to contract a mouldiness, which will give a taste to the goods greatly to their disadvantage.

Some distillers, as soon as their berries are gathered, put them into casks, and cover them with spirits of wine: by this method the berries are indeed well preserved, without any danger of

contracting an ill smell, which they are very apt to do by the other methods, unless the greatest care be taken; but then it must be remembered, that the spirit will extract great part of their essential oil, in which their virtues consist, and consequently the berries themselves will be rendered of little value. If, therefore, you preserve your berries in this manner, you should put into each cask or jar only the quantity you use for one charge of your still, and when you have occasion to use them, put both the spirits and berries into your alembic.

Thus your berries will be finely preserved, without any loss either of their essential oil, or the spirits made use of to preserve them.

RECEIPT FOR MAKING TEN GALLONS OF GENEVA.

Take of juniper berries, three pounds; proof spirit, ten gallons; water, four gallons. Draw off by a gentle fire till the faints begin to rise, and make up your goods to the strength required with clean water.

The distillers generally call those goods which are made up proof by the name of royal geneva;

for the common sort is much below proof, ten gallons of spirit being sufficient for fifteen gallons of geneva. Nay, what is generally sold at the common alehouses is made in the following manner:—

Take of the ordinary malt spirits, ten gallons; oil of turpentine, two ounces; bay salt, three handfuls. Draw off by a gentle fire till the faints begin to rise, and make up your goods to the strength required with clean water.

In this manner is the common geneva made, and it is surprising that people should accustom themselves to drink it for pleasure.

There is a sort of this liquor called Holland's geneva, from its being imported from Holland, which is greatly esteemed.

The ingredients used by the Dutch are, however, the same as those given in the first receipt of this chapter, only instead of malt spirit they use French brandy. In the first part of this Treatise we have sufficiently shewn the nature of French brandy, and in what its excellence consists; and also that, by the help of a clean spirit, cordial waters may be made with the same good-

ness as those drawn with French brandy. If, therefore, the distiller be careful in distilling and rectifying his malt spirit, he may make geneva equal to that of the Dutch, provided it be kept to a proper age; for all spirituous liquors contract a softness and mellowness by age, impossible to be imitated by art.

CHAPTER LVI.

OF CHERRY BRANDY.

This liquor is greatly called for in the country, and is made different ways. Some press out the juice of the cherries, and having dulcified it with sugar, add as much spirit to it as the goods will bear, or the price it is intended to be sold for. But the common method is to put the cherries clean picked into a cask, with a proper quantity of proof spirit, and, after standing eighteen or twenty days, the goods are drawn off into another cask for sale, and about two-thirds of the first quantity of spirits poured into the cask upon the cherries. This is suffered to stand about a month to extract the whole virtue from the cherries, after which it is drawn off as before; and the cherries pressed to take out the spirit they had absorbed. The proportion of cherries and spirit

is not very nicely observed; the general rule is to let the cask be about half filled with cherries, and then filled up with proof spirits. Some add to every twenty gallons of spirit, half an ounce of cinnamon, an ounce of cloves, and about three pounds of sugar, by which the flavour of the goods is considerably increased. But in order to save expenses, not only the spices and sugar are generally omitted, but also a great part of the cherries, and the deficiency supplied by the juice of elder berries. Your own reason, therefore, and the price you can sell your goods for, must direct you in the choice of your ingredients.

By the same method you may make raspberry brandy; and if the colour of the goods be not deep enough, it may be improved by an addition of cherry brandy.

CHAPTER LVII.

OF HONEY WATER.

THIS water has its name from the honey in its composition; though that ingredient is but of very little service to the water, if made according to the usual method.

RECEIPT FOR MAKING A GALLON OF HONEY WATER.

Take of the best honey and coriander seeds, of each one pound; cloves, one ounce and a half; nutmegs and gum benjamin, of each an ounce; vanilloes, number four; the yellow rind of three large lemons: bruise the cloves, nutmegs, coriander seeds, and benjamin, cut the vanilloes in pieces, and put all into a glass alembic, with one gallon of clean rectified spirit, and, after digesting forty-eight hours, draw off the spirit in *Balneum Mariæ*. To a gallon of the above spirit, add damask rose water and orange flower water, of each a pound and a half; musk and ambergris, of each five grains. Grind the musk and ambergris with some of the water in a glass mortar, and afterwards put all together into a digesting vessel, shaking them well together, and let them circulate three days and three nights in a gentle heat; then let all cool; filter and keep the water in bottles well stopped for use.

This water was first made by that faithful chemist, Mr George Wilson, for King James II. It is an antiparalytic, smooths the skin, and gives one of the most agreeable scents imaginable. Forty or sixty drops put into a pint of clean water,

are sufficient for washing the hands and face; and the same proportion to punch, or any cordial water, gives a very agreeable flavour.

CHAPTER LVIII.

OF UNEQUALLED WATER, GENERALLY SOLD BY THE FRENCH NAME *L'EAU SANS PAREILLE.*

THERE are two sorts of this water, one drawn considerably below proof, rendered fine by filtration, and the other without the faints, the receiver being removed as soon as they begin to rise. The latter is much the best, though dearer than the former.

RECEIPT FOR MAKING A GALLON OF THE COMMON *L'EAU SANS PAREILLE.*

Take the outer peels of twelve citrons, three quarts of fine proof spirit, and a quart of water. Put all into a glass alembic, and distil to a dryness in *Balneum Mariæ;* filter the water, and put it into bottles well stopped.

This is the common sort, and what is generally sold here under the name *Eau sans Pareille.*

RECEIPT FOR MAKING A GALLON OF THE BEST SORT OF *L'EAU SANS PAREILLE.*

Take of the essence of cedrat, bergamot, orange, and lemon, of each two drachms; rectified spirit, a gallon; water, two quarts. Put all into a glass alembic, and distil in *Balneum Mariæ* till the faints begin to rise, when the receiver must be immediately removed.

Some, to save the trouble and expense of distillation, mix the essences with the spirit of wine, in the manner before mentioned in the chapter for making Hungary water; but this is greatly inferior to that made by distillation.

CHAPTER LIX.

OF THE WATER OF BOUQUET.

This water has its name from its inventor, and is greatly esteemed abroad for its smell. It is indeed drawn from the most odoriferous flowers, and therefore it is no wonder that it is held in great esteem.

RECEIPT FOR MAKING A GALLON OF BOUQUET'S WATER.

Take of the flowers of white lilies, and Spanish jessamine, of each half a pound; orange flowers, and those of the jonquil and pink, of each four ounces; damask roses, one pound. Let those be fresh gathered and immediately put into a glass alembic with a gallon of clean proof spirit, and two quarts of water. Place the alembic in *Balneum Mariæ*, draw off till the faints begin to rise. You may use spirit of wine instead of proof spirit; but it will be absolutely necessary that it be entirely inodorous; for otherwise your water will fall short of the desired perfection.

CHAPTER LX.

OF CYPRUS WATER.

This water is only a dilute tincture of ambergris; but as it is used by those who are fond of that perfume, and known by the name of Cyprus Water, or *Eau de Cypre*, I would not omit giving the receipt here, intending to give a full account of ambergris in a succeeding chapter.

RECEIPT FOR MAKING A GALLON OF CYPRUS WATER.

Take of the essence of ambergris, half an ounce; put it into a glass alembic, with a gallon of spirit of wine, and two quarts of water. Place the alembic in *Balneum Mariæ*, and draw off till the faints begin to rise.

CHAPTER LXI.

OF VESTAL WATER, OR *EAU DE VESTALE.*

This is a very agreeable water, and has been long in use in several parts of Europe.

RECEIPT FOR MAKING A GALLON OF VESTAL WATER.

Take of the seeds of *daucus creticus*, or candy carrots, two ounces; spirit of wine, a gallon; water, two quarts. Distil in *Balneum Mariæ* till the faints begin to rise. Then add to the spirit drawn over an ounce of the essence of lemons, and four drops of the essence of ambergris; redistil in *Balneum Mariæ*, and keep the water in bottle, well stopped for use.

CHAPTER LXII.

OF BEAUTY WATER, OR *EAU DE BEAUTE.*

THIS water has its name from its use in washing the face, and giving an agreeable smell. It is drawn from thyme and marjorum, which gives it a very elegant odour.

RECEIPT FOR MAKING A GALLON OF BEAUTY WATER.

Take of the flowery tops of thyme and marjorum, of each one pound; proof spirits, five quarts; water, one quart. Draw off in *Balneum Mariæ*, till the faints begin to rise, and keep it close stopped for use.

CHAPTER LXIII.

OF ROYAL WATER.

THIS water has its name from being considered as the most excellent of all scented waters. It is compounded of the cedrat, nutmegs, and mace, from whence the most elegant smell is produced;

and no water is at present thought equal to this. There are two sorts of royal water, one produced by a single distillation, and the other by a double distillation, and thence called rectified or double distilled royal water.

RECEIPT FOR A GALLON OF ROYAL WATER.

Take of mace, one ounce; nutmegs, half an ounce; essence of cedrat, or bergamot, two drachms: put these into a glass alembic (after bruising the spices) with five quarts of fine proof spirit, and draw off one gallon in *Balneum Mariæ*.

RECEIPT FOR MAKING A GALLON OF DOUBLE DISTILLED ROYAL WATER.

Take of mace, one ounce; nutmegs, half an ounce: bruise them, and put them into an alembic with six quarts of fine proof spirit, and draw off five quarts with a gentle fire. Then take the spirit drawn off, and put into a glass alembic, with two drachms of the essence of cedrat, or bergamot, and draw off a gallon in *Balneum Mariæ*.

Either of these receipts will produce an elegant water; but the latter greatly exceeds the former.

CHAPTER LXIV.

OF THE TINCTURE AND ESSENCE OF AMBERGRIS, MUSK, AND CIVET.

1. AUTHORS have been long divided with regard to the origin of ambergris; some taking it for a vegetable juice, which either dropped into the water from the trunks or branches of some trees growing on the sea-coast, or exudated from their roots, which ran out of the earth into the sea; some for an animal production, and formed either by a secret process from honey-combs, or the dung of birds; and others have very circumstantially recorded that it is produced in the whale. These opinions are, however, now looked upon as false; ambergris being universally allowed to be a mineral production, of the number of bitumens. It is a light and frothy substance, which generally bubbles up out of the earth in a fluid form, principally under water, where it is by degrees hardened into the masses we see it in.

Ambergris, in its natural or common form, is a lax and coarse substance, of an irregular structure, friable, and so light as to swim upon water.

It is of a pale grey colour, with a faint tinge of brown in it; but pieces perfectly and uniformly of this colour are rare; what we usually meet with is composed of whitish, yellowish, and blackish granules; and in proportion as there is more or less of this whitish matter in these masses, it is more or less scented and valuable. It is found in pieces of perfectly irregular figures, and from the bigness of a pea to those of ten, twenty, or more pounds; nay, there have been masses found of more than two hundred weight.

It should be chosen in clean and not over friable pieces, of a pale grey colour, and as uniform as possible in its structure, with small black specks within.

There are two sorts of essences made from this perfume; one without addition of any other odoriferous substance, and the other from ambergris compounded with musk and civet.

RECEIPT FOR MAKING THE ESSENCE OF AMBERGRIS.

Take of ambergris and white sugar-candy, of each three drachms; grind them well together in

a glass mortar, adding to them, by slow degrees, five ounces of rectified spirit of wine; digest the whole in a matrass, (represented fig. 8.) well stopped for four days, and then separate the clear tincture or essence, which keep in a bottle well stopped for use.

RECEIPT FOR MAKING THE COMPOUND ESSENCE OF AMBERGRIS.

Take of ambergris and white sugar-candy, of each two drachms; musk, twelve grains; civet, two grains: grind all these well together in a glass mortar, adding by degrees four ounces of rectified spirit of wine: digest and separate the clear essence for use, as in the preceding receipt.

2. Musk is a dry, light, and friable substance, of a dark blackish colour, with some tinge of a purplish or blood colour in it. It is soft, and somewhat smooth and unctuous to the touch, and of a highly perfumed smell. It is brought to us sewed up in a kind of bladders or cases of skin, covered with a brownish hair, which are the real bags in which the musk is lodged while on the animal. Musk should be chosen of a very strong

scent, and in dry sound bladders; and must be kept close shut down in a leaden box, by which means it will retain its smell, and not grow too dry.

RECEIPT FOR MAKING THE ESSENCE OF MUSK.

Take of musk and white sugar-candy, of each one drachm; rub them well together in a marble mortar, adding by degrees, during the rubbing, five ounces of rectified spirit of wine: put the whole into a matrass, digest three days in a gentle heat, and pour off the clear essence, which keep in a bottle well stopt for use. Some add a few grains of civet to their essence of musk, which considerably augments the fineness of the perfume.

3. Civet is produced, like musk, in bags growing to the lower part of the belly of an animal. It is of different colours, from a pure lively whitish, to a black; but the nearer it approaches to the white, the better it is; of an extremely strong smell, and a bitterish pungent taste.

The essence of civet is rarely used alone, but of great service in making additions to other

odoriferous waters, and therefore I shall here give the method of making it.

RECEIPT FOR MAKING THE ESSENCE OF CIVET.

Take of civet and double refined sugar, of each two drachms; rub them well together in a glass mortar, adding by degrees five ounces of rectified spirit of wine: put the whole into a matrass, digest three days in a gentle heat, and pour off the clear essence for use. Though the essences in this chapter are, properly speaking, chemical preparations, and therefore foreign to the business of the distiller; yet as they are often added to perfumed waters, and easily made, I thought the above receipts would not be unacceptable to the reader.

CHAPTER LXV.

OF FAINTS, AND THE USES THEY MAY BE APPLIED TO.

In many of the preceding receipts I have ordered the receiver to be removed as soon as the faints begin to rise; because otherwise the goods

would contract a disagreeable taste and smell. It is not, however, to be understood that these faints are to be thrown away, nor the working of the still immediately stopped; for they are far from being of no value, notwithstanding they would be of great disadvantage if suffered to run among the more spirituous parts of the goods before drawn off. As soon, therefore, as you find the clear colour of the goods begins to change of a bluish or whitish colour, remove the receiver, place another under the nose of the worm, and continue the distillation as long as the liquor running from the worm is spirituous, which may be known by pouring a little of it on the still-head, and applying a lighted candle to it; for if it is spirituous it will burn, but otherwise not. When the faints will no longer burn on the still-head, put out the fire, and pour the faints in a cask for that purpose; and when, from repeated distillations, you have procured a sufficient quantity of these faints, let the still be charged with them almost to the top. Then throw into the still three or four pounds of salt, and draw off as you would any other charge, as long as the spirit extracted is of a sufficient strength; after which the receiver is to be removed, and the faints saved by themselves as before.

The spirits thus extracted from the faints will serve in several compositions as well as fresh; but they are generally used in aniseed water, because the predominant taste of the aniseeds will entirely cover that they had before acquired from other ingredients.

INDEX.

THE END.

Printed by Walker & Greig,
Edinburgh.