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**CHAP. XVI.****SPIRITUS STILLATITIL.—DISTILLED SPIRITS.**

**ALCOHOL** dissolves the essential oils of vegetables in much larger quantity than water does, and it might therefore be supposed that it may be more strongly impregnated with them by distillation, and hence possess in a much greater degree the aromatic flavour and pungency of the plant from which it is distilled. It is seldom, however, that this is the case; and from many vegetables alcohol acquires by distillation a weaker impregnation than water. This is owing to its greater volatility. All the essential oils are volatilized at a temperature of  $212^{\circ}$ , and must therefore rise with water in distillation, and impregnate it to the extent in which it can dissolve them. But there are many of them not volatilized at the temperature at which alcohol boils, and when it is distilled, therefore, from the plants containing them, it comes over weakly impregnated with their odour or pungency.

To obviate this, diluted alcohol, or proof-spirit as it is named, is employed in the distillation. It is macerated on the vegetable substance and is then distilled; the alcohol rises first nearly pure, but as the distillation proceeds, the liquor requires a higher temperature to cause it to boil: the vapour therefore is more largely impregnated with the essential oil, and towards the end of the distillation the whole of it is brought over with the last portion of water; and the

spirit, which has previously been distilled, being mingled with this, forms a transparent solution. This forms a distilled spirit. There are at least only two officinal spirits in which pure alkohol is the solvent,—the spirit of lavender and spirit of rosemary, the essential oils of these plants being sufficiently volatile to be elevated at the temperature at which alkohol distils.

Distilled spirits are preparations of no great importance. Like the distilled waters they serve as vehicles for the administration of more active medicines, the taste and flavour of which they cover or render more grateful; or they are occasionally employed as grateful stimulants, to relieve nausea or flatulence. The directions for preparing them are given, in the Edinburgh Pharmacopœia, under the first of them, the Spirit of Caraway, and in the London and Dublin Pharmacopœias are almost precisely the same.

Take of Caraway Seeds bruised, half a pound; Diluted Alkohol, nine pounds. Macerate during two days in a close vessel; then add a sufficient quantity of water to prevent empyreuma, and draw off nine pounds by distillation.

In the same manner are prepared the following Spirits, Nine Pounds being drawn from the quantities affixed:

SPIRITUS CORTICIS LAURI CINNAMOMI. Spirit of Cinnamon.  
Ed. Lond. Dub. (Bark of Cinnamon, one pound).

SPIRITUS MENTHÆ PIPERITÆ FLORENTIS. Spirit of Peppermint.  
Ed. Lond. Dub. (Herb of Peppermint, one pound and a half).

SPIRITUS NUCIS MYRISTICÆ MOSCHATÆ. Spirit of Nutmeg. Ed.  
Lond. Dub. (Nutmeg, bruised two ounces).

SPIRITUS FRUCTUS MYRTI PIMENTÆ. Spirit of Pimento. Ed.  
Lond. Dub. (Fruit of Pimento, bruised, half a pound).

To these may be added the following from the London Pharmacopœia:

*SPIRITUS ANISI.* Spirit of Anise.

*SPIRITUS MENTHÆ VIRIDIS.* Spirit of Spearmint.

*SPIRITUS PULEGIJ.* Spirit of Pennyroyal.

All these spirits have the aromatic flavour, and to a certain extent the pungency of the vegetables from which they are prepared. They require no particular observations.

Of Compound Spirits, the following have a place in the Pharmacopœias :

*SPIRITUS JUNIPERI COMPOSITUS.* Compound Spirit of Juniper. Ed. Lond. Dub.

Take of Juniper Berries bruised, one pound; Caraway Seeds, Fennel Seeds, of each bruised, one ounce and a half; Diluted Alcohol, nine pounds. Macerate for two days; and, having added as much Water as is sufficient to prevent empyreuma, draw off nine pounds by distillation.

This is a grateful cordial spirit, which has been used as a carminative, and as a stimulant and diuretic in dropsy.

*SPIRITUS ANISI COMPOSITUS.* Compound Spirit of Anise. Dub.

Take of Anise Seeds, Angelica Seeds, of each bruised half a pound; Proof-spirit, one gallon; Water as much as is sufficient to prevent empyreuma. Distil one gallon.

This is similar to the preceding spirit, milder and perhaps less grateful. It has been used as a carminative.

*SPIRITUS ARMORACIÆ COMPOSITUS.* Spirit of Horse-radish. Lond. (*Spiritus Raphani Compositus.* Dub).

Take of fresh Horse-Radish root cut, dried Orange Peel, of

each one pound; Nutmegs bruised, half an ounce; Proof-spirit, a gallon; Water, as much as is sufficient to prevent empyreuma. Macerate for twenty-four hours, then distil a gallon with a slow fire.—There was formerly in this composition two pounds of fresh scurvy grass, and this is still retained by the Dublin College.

This compound spirit was once employed as an antiscorbutic. It has justly fallen into disuse.

There remain, lastly, those Distilled Spirits prepared with Pure Alcohol.

*SPIRITUS LAVANDULÆ SPICÆ.* Spirit of Lavender. Ed. Lond. Dub.

Take of Fresh Lavender Flowers, two pounds; Alcohol, eight pounds. Draw off seven pounds by distillation with the heat of a water-bath.

The oil of Lavender is sufficiently volatile to be elevated with alcohol in vapour, and it is completely dissolved by it. The spirit is used principally as a grateful stimulating perfume, which gives relief in headach, being drawn up the nostrils, or applied to the forehead.

*SPIRITUS LAVANDULÆ COMPOSITUS.* Compound Spirit of Lavender. Ed. Lond. Dub.

Take of Spirit of Lavender, three pounds; Spirit of Rosemary, one pound; Cinnamon Bark bruised, one ounce; Cloves bruised, two drachms; Nutmeg bruised, half an ounce; Red Saunders Wood rasped, three drachms. Macerate seven days, and strain. (In the formula given by the London College the cloves are omitted).

This tincture is a grateful cordial and stimulant in com-

mon use, for relieving languor and faintness. Its dose is thirty or forty drops, taken on a piece of sugar or in a cupful of water.

**SPIRITUS ROSISMARINI OFFICINALIS.** Spirit of Rosemary. Ed. Lond. Dub.

Take of Fresh Rosemary Tops, two pounds; Alcohol, eight pounds. Draw off seven pounds by distillation by the heat of boiling water.—The London College employ diluted alcohol in the preparation of this spirit.

Spirit of Rosemary is a very fragrant perfume, and is in common use for the same purposes as the simple Spirit of Lavender.

**ALCOHOL.** Alcohol. Spiritus Vinosus Rectificatus. Rectified Spirit of Wine.

There is no process given in the Edinburgh Pharmacopœia for the preparation of alcohol. It is supposed to be procured from those who prepare it on a large scale, and is inserted in the catalogue of the articles of the *Materia Medica*, as of the specific gravity .835, this being a strength at which it can be procured without difficulty, and being sufficient for nearly every purpose to which it requires to be applied in Pharmacy. It is procured of this strength from any of the spiritous liquors of commerce by slow distillation with a gentle heat, a portion of sub-carbonate of potash heated being previously added to abstract the water more effectually from the spirit. It is usually submitted to a second distillation, a little alum being added previous to this, to remove any of the alkali which might be held in solution in the spirit obtained by the first distillation.

The London and Dublin Colleges, while they have also

inserted alkohol of this strength, under the name of Rectified Spirit, in the catalogue of the articles of the *Materia Medica*, have given a process to obtain it more concentrated for particular purposes. The following are the directions in the *London Pharmacopœia* :

Take of Rectified Spirit, a gallon; Sub-carbonate of Potash, three pounds. To the spirit add a pound of the sub-carbonate of potash previously heated to  $300^{\circ}$ , and macerate for twenty-four hours, shaking frequently; then to the spirit poured off, add the remaining portion of the sub-carbonate of potash heated to the same degree; lastly, distil the alkohol from a water-bath, and keep it in a vessel well stopt. The specific gravity of alkohol is to that of distilled water as 815 to 1000.

The process in the *Dublin Pharmacopœia* is nearly the same.

Take of Rectified Spirit, a gallon; of Potashes dried by a heat of  $300^{\circ}$ , and warm, a pound; of Caustic Potash, an ounce; Muriate of Lime dry, half a pound. Mix the spirit and the potash; add the potashes previously rubbed to powder, and digest the mixture in a close vessel for three days, agitating frequently. To the spirit poured off, add the muriate of lime: distil with a gentle heat, until what remains begins to become thick. The specific gravity of the liquor is to that of distilled water as 815 to 1000. The muriate of lime may be conveniently obtained from the matter remaining in the distillation of water of ammonia.

The concentration of the alkohol in these processes is obviously obtained by the action of substances having a strong affinity to water,—the sub-carbonate of potash, and the muriate of lime; these attract it from the spirit, and counteract its volatility so as to prevent it from rising in the distillation. The muriate of lime exerts this agency most powerfully; and by repeated distillation from it, al-

kohol has been brought to its highest state of concentration, its specific gravity being so low as .800 or .798, at the temperature of 60°. Alkohol, rectified so highly as is ordered by the London and Dublin Colleges, is required for very few pharmaceutic processes; and hence, in the greater number of their officinal preparations, rectified spirit, that is, alkohol of the specific gravity of .835, is directed to be employed. This contains in 100 parts nearly 10 of water, with 90 of alkohol of the specific gravity of .815: what proportion of water the latter contains, or what constitutes real alkohol, is altogether unknown. The proof-spirit of the Edinburgh College, formed from equal parts of rectified spirit and water, is of the specific gravity of .935. That of the London and Dublin Colleges is stated at .930, and will be obtained of this strength by mixing four parts by measure of rectified spirit with three parts of water. The properties of alkohol as an agent in pharmacy, and its medicinal applications, have been already enumerated.

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## CHAP. XVII.

OLEA VOLATILIA, OLIM OLEA STILLATITIA VEL ESSENTIALIA.—VOLATILE OILS, FORMERLY DISTILLED OR ESSENTIAL OILS.

ESSENTIAL oil, as a proximate principle of vegetables, has already been considered, and its distinctive properties pointed out. As yielded by different vegetables, its chemical