

**Vinum.—Wine.**

*Vinum Album.*—White wine. A pale, amber-colored or straw-colored alcoholic liquid, made by fermenting the unmodified juice of the grape, freed from seeds, stems, and skins. . . . White wine should contain not less than *ten per cent* nor more than *twelve per cent* by weight of absolute alcohol. (U. S. P.)

*Vinum Album Fortius.*—Stronger white wine. (White wine, seven parts; alcohol, one part.) (U. S. P.)

These are the only wines recognized by the United States Pharmacopœia. In medical practice a great variety are employed, in accordance with special indications. It would occupy too much space, and be foreign to the purpose of this work, to enter into details in regard to particular wines, but some attention should be given to the different groups.

*Sparkling Wines.* (Champagne, sparkling catawba, etc.)—These are wines which have been bottled before the stage of fermentation has been completed, hence they are lively, or sparkling, in consequence of being charged with carbonic acid. A considerable portion of the grape-sugar has not been converted into alcohol; they are sweet wines, therefore, and the quantity of absolute alcohol which they contain is relatively low (eight to twelve per cent). Sparkling hock is a lighter wine than champagne, and contains less sugar. Sparkling catawba more nearly resembles hock than champagne.

A sophistication now much practiced consists in adding to still wines carbonic-acid gas, by pressure, in the same manner that carbonic-acid water is manufactured.

*Dry Acid Wines.*—The best specimens of this group are the German Rhine and Moselle wines, California hock, and Ohio and Kelly-Island catawba. The German varieties are very numerous, and are remarkable for their flavor, for the completeness of the fermentation (absence of sugar), and for their permanence. The most important of the varieties are the following: Dürkheimer, Ungsteiner, Hochheimer, Deidesheimer, Förster, Rudesheimer, Johannisberger, Liebfrauenmilch, etc. The French wines are, as a rule, rather acid. The best known are the clarets, but these are more properly classed with the red wines.

*Sweet Wines.*—In this group are contained burgundy, still champagne, muscatel, malaga, Hungarian tokay, and angelica, madeira, etc. The alcoholic strength of these wines, unless fortified, is relatively low, because the sugar has not been consumed by the fermentation.

*Light Red Wines.*—The French clarets, the red Rhine wines, the American Ives's seedling, and Concord and Hungarian, are members of this group. They contain a large proportion of the coloring-matter of the grape, and considerable tannic acid.

*Heavy Red Wines.*—Port is the principal representative of this group, but it is not a natural wine; during the process of manufacture spirit is added, and its alcoholic strength is raised to thirty or forty per cent. California port when fortified, as it probably frequently is, should be classed in this division.

*Dry Spirituous Wines.*—The most important member of this group is sherry.

**COMPOSITION AND PROPERTIES.**—The composition of wine is extremely complex. The constituents ascertainable by chemical analysis do not represent all of the peculiar qualities which render various wines desirable. Bouquet and flavor can not be determined by the most expert chemist, and elude all other means of investigation but the tongue and nose of the "wine-taster."

A wine is a solution of alcohol in water, mixed with various constituents of the grape. The proportion of alcohol ranges from six to forty per cent—the largest quantity being found in the artificial wines, such as port and sherry. The proportion of sugar varies greatly—from three to twenty-five per cent. The acids are fixed (tartaric) and volatile (acetic). The relation between these several constituents is nearly as follows: Port contains about fifty-three parts by weight of alcohol to one part of acid, and twelve parts of sugar to one part of acid. The average of sherry is thirty-nine of alcohol and 1.5 of sugar to one of acid. In the sweet wines, the average is about thirty parts of sugar to one part of acid and fifteen parts of alcohol. In the acid wines, the average proportion of alcohol to acid is as eighteen to one, while the sugar is almost absent, and in some of the best is entirely so. Those are *dry wines* which are free from sugar. Besides tartaric and acetic acids, wines contain, in much smaller quantity, malic, tannic, and carbonic acids. Wines containing less than three hundred grains of acid to the gallon are wanting in flavor; on the other hand, an excess of acid over five hundred grains to the gallon is too sour to be agreeable. The coloring-matter of wine varies greatly, and the distinction between "white" and "red" depends on the quantity present in these different varieties. The red wines are more astringent, due to the larger proportion of tannin which they contain, and they are also rougher to the taste.

Wine contains a great many mineral constituents; tartrates of potassa and lime, chlorides of sodium, potassium, and calcium, and sulphates of potassa and lime. The percentage of ash ranges from 0.18 to 0.40.

**NOTE.**—Among the best wines for medicinal use are the Hungarian wines of Mr. L. Reich, of New York. The tokay has fine bouquet and flavor and good body, and the red wine is a claret of excellent quality. These wines are to be commended because they present satisfactory evidence of being the product of the fermentation of pure grape-juice.



The peculiar odor of wine (bouquet) is due to œnanthic acid, and œnanthic ether, produced by a reaction of the acid on the alcohol.

According to Fresenius, the quality of a wine is so much the better *the less it contains of free acid, the more it contains of sugar, and the greater its quantity of extract*; and, further, its quality is not decidedly influenced by the quantity of alcohol, and can not be determined by its specific gravity.

A certain quantity of free acid is necessary, but it should not be greater than can be masked by the alcohol, sugar, and extractive matter. The flavor and odor of wine are produced by ethers formed by the action of the free acid on the alcohol; hence the importance of this acid constituent.

Dr. Druitt, in his "Report on Cheap Wines," has very well summed up the qualities of good wine in the following conclusions:

- "1. The wine should have an absolute *unity*, or taste as one whole.
- "2. Wine should contain a certain amount of alcohol.
- "3. Wine should be slightly sour.
- "4. Sweetness is characteristic of a certain class of wines, while certain other wines are *dry*, or free from sugar.
- "5. Wines should have a taste free from mawkishness, and indicative of instability.
- "6. Roughness or astringency is a most important property, and belongs to most red wines. In moderation it is relished, as sourness is, by a healthy, manly palate, just as the cold souse is welcome to the skin. In excess it leaves a permanent harshness on the tongue.
- "7. The wine must have *body*. This is the impression produced by the totality of the soluble constituents of wine—the extractive, that which gives *taste* to the tongue, and which, as wine grows older, is deposited along with the cream of tartar forming the *crust*.
- "8. *Bouquet* is that quality of wine which salutes the nose. *Flavor* is that part of the aromatic constituent which gratifies the throat.
- "9. The wine must *satisfy*. A man must feel that he has taken something which consoles and sustains. Some liquids, as cider and thin wines, leave rather a craving, empty, hungry feeling after them."

PHYSIOLOGICAL ACTIONS.—As respects the alcohol which they contain, the physiological actions of wines could be discussed with the previous article. But wines differ from alcohol, and from brandy and whisky, not only in spirituous strength, but in the possession of the varied and important constituents mentioned above.

The sparkling wines are more sedative to the stomach, and are more intoxicating, relatively to their alcoholic strength, than the other wines. As they contain a considerable quantity of unappropriated sugar, acid fermentation is apt to occur, and acidity, with headache, follows their use. As respects the influence on the pulse, they are less stimulating than the stronger wines, and the experiments of Dr. Ed-

ward Smith have demonstrated that they increase the excretion of carbonic acid.

The dry acid wines are more purely stimulant, partly in consequence of their alcohol, and partly in consequence of the important ethers which they contain. As they are free from sugar, acid fermentation does not follow their use, but with some subjects the free acid present in them disagrees.

The sweet wines have, generally, considerable body and alcoholic strength. They rather pall on the appetite; are apt to disorder the stomach, and produce headache. Some of them have fine bouquet and flavor, and are satisfying to the palate; but as a rule they are not borne as well as the dry wines.

The red wines, light and dark, are astringent and have considerable body and alcoholic strength. The tannin which they contain, and coloring-matters, are apt to cause stomach-disorders, constipation, and a febrile state. By reason of the large amount of alcohol in them, especially in port, they approach whisky and brandy in power as stimulants and narcotics.

#### THERAPY.—

"Good wine is a good familiar creature, if it be well used." (Othello.)

The effervescing or sparkling wines often render important service in irritable states of the stomach without inflammatory action. The *vomiting of pregnancy*, of *sea-sickness*, of *yellow fever*, of *cholera-morbus*, with *depression*, and of *true cholera*, are not infrequently arrested by tablespoonful-doses of iced champagne every fifteen minutes.

A generous glass of a dry wine (sherry) taken with the principal meal greatly assists the digestion of the sedentary who suffer from *atonic dyspepsia*. The wine should be taken during the course of the meal, and at no other time. Persons who suffer from *acidity*, due to an excess of formation of acid gastric juice, are relieved by a dry acid wine, taken during the meal or just previously. For this purpose a genuine Rhine wine—for example, Förster Riesling—is best.

In *diarrhœa* and *dysentery*, after the acuter symptoms have subsided, and when there is considerable depression, those wines are indicated which contain tannin—the red wines, claret, Ives's seedling, port, etc.

In cases of *anæmia* and *chlorosis*, wines render an important service by increasing digestion and assimilation. To aid in this process, red wines with a good deal of sugar and extractives are most necessary. When wines produce headache, and the digestion is disordered by them, and the appetite impaired, they are not serviceable in these maladies. Moreover, for the nervous and hypochondriacal, wines must be prescribed with caution, for the habit of indulgence is quickly acquired by such subjects. In *convalescence from acute diseases*, there



can be no difference of opinion as to the great value of wine as a restorative. Wines of considerable body and alcoholic strength are indicated under these circumstances. When there is much nervous restlessness, wakefulness, and cardiac depression, a wine rich in ethers is specially useful, according to Anstie. In chronic wasting diseases, as *phthisis*, *scrofula*, etc., the stronger wines, as sherry, burgundy, port, may take the place, in some cases, of the spirits, whisky and brandy. In these wasting diseases, wines serve a double purpose: they stimulate the activity of the primary assimilation, and within certain limits they are utilized as foods. They are only harmful when digestion is impaired by them; and under no circumstances can they take the place of other aliment.

In *passive hæmorrhages*, in the *hæmorrhagic diathesis* and in *purpura*, wines are indicated, because they elevate the arterial tension, and thus act indirectly as hæmostatics.

In various *acute diseases*, when the *action of the heart becomes feeble and irregular*, the *pulse dicrotic*, and there occur *wakefulness and delirium*, a wine of considerable alcoholic strength and rich in ethers is peculiarly serviceable. Wines are much more largely used in fevers (*typhoid*, *typhus*, etc.) than in any other forms of disease, and the circumstances requiring their employment are indicated in the preceding sentence. The routine practice of alcoholic stimulation in fevers can not be justified. Exact indications for the use of wine exist in the state of the heart and arterial system, and of the brain, and these should be sought for in every case, instead of prescribing for the name. In fevers, wines precede the spirituous liquors. The first weakening of the heart's action, the beginning of dicrotism, and the transitory delirium and subsultus, require champagne and the light and acid wines; more profound adynamia, with diarrhœa, the stronger red wines.

In *acute inflammations* (*pneumonia*, *pleuritis*, *peritonitis*, etc.), wines serve to maintain the strength when the powers of life are weakening, or to maintain the functions of brain and heart when crises occur, as in pneumonia. The rules for the administration of wine in acute inflammations are the same as in fevers.

Next to their use in fevers, wines are most frequently prescribed, and with the greatest advantage, in *surgical practice*, for the *consequences of wounds and injuries*, to *support the powers of life under protracted and profuse suppuration*, and to favor digestion and assimilation in the course of convalescence from surgical diseases.

The immediate stimulant effect of wine is of great value in *sudden and profuse loss of blood*, whether from injuries and surgical operations, or *post partum*. A highly-etherized wine of good body is most useful here, because it produces a prompt effect and easily yields up the force needed to keep the heart and brain in action, and, in the

case of the relaxed uterus, to furnish the power needed to procure its energetic contraction.

**Beer, Ale, Porter.**—*Beer* and *ale* are fermented liquors made from malted grain, hops and other bitter substances being added. Ale is produced by rapid fermentation, in which the yeast rises to the surface, and beer is the product of slow fermentation in cool cellars, the yeast falling to the bottom. Hence the name *lager-beer*. *Porter* embraces the qualities of beer and ale, and is so named on account of its strong quality, which endeared it to porters.

**COMPOSITION.**—The proportion of alcohol varies somewhat. In Edinburgh ale it amounts to about six per cent; in brown stout, to six per cent; in porter, to four per cent; in beer, two to three per cent. Besides alcohol and water, these malt liquors contain extract of malt, five to fourteen per cent; carbonic acid, 0.16 to 0.60 per cent. In the extract are found also various aromatic substances, lactic acid, potash and soda salts, etc.

**PHYSIOLOGICAL ACTIONS.**—So far as the alcohol is concerned, beer, ale, and porter correspond in physiological actions to the spirituous liquors and to wines. As they contain malt extract, their nutritive value is greater than spirits and wine. An important constituent, the hop, being an aromatic bitter, the tonic and stomachic qualities of these malt liquors are also greater than their congeners. The process of fermentation, however, lessens in a remarkable degree the nutritive and stomachic qualities of the constituents which enter into the composition of malt liquors. Their value as foods is much exaggerated by the habitual consumers. They increase the appetite and favor the deposition of fat. Although the malt beverages do not cause to anything like the same extent the alterations in the nervous centers produced by the spirituous, they induce other and almost as important structural changes. They set up in the organism fatty degeneration of various tissues, notably of the liver and heart. The habitual beer-consumer is known by his obesity, his flushed face, embarrassed breathing, puffy hands, yellow conjunctiva, etc.; he is usually short-lived, and the end is reached by hepatic and cardiac disorders. It is certainly true that a moderate amount of beer may be taken daily, for a lifetime, without any obvious impairment of the functions; but excessive use produces with great certainty the unfavorable effects above described.

**THERAPY.**—Beer, ale, and porter are not usually prescribed in acute maladies. They are, however, much and justly esteemed as *stomachic tonics* and *restoratives* in chronic wasting diseases—for example, in *convalescence from acute diseases* and *surgical injuries*, in cases of *profuse and protracted suppuration*, *prolonged lactation*, *diseases of the joints*, *scrofula*, *phthisis*, etc. Strumpf finds, however, that alco-



holic beverages only increase the amount of fat in milk, and not the quantity of milk as a whole.

The malt liquors are harmful in all stomach-disorders with acidity, and in chronic affections of the liver, especially fatty liver. When these beverages do not improve the appetite, when they cause a sense of epigastric oppression, and when they coat the tongue, they are not beneficial.

When *wakefulness* is due to cerebral anæmia, a glass of beer or ale at bedtime will frequently produce satisfactory sleep. *Puerperal mania*, *delirium tremens*, and *acute maniacal delirium*, when these symptoms coexist with a condition of adynamia, are greatly benefited by the liberal use of ale (pale or Edinburgh ale). The effect of this remedy is to arouse the appetite, to quiet delirium, and to produce sleep. In *melancholia*, excellent results are often obtained by the use of porter with a little tincture of opium.

**EXTRACT OF MALT.**—Under this name is known a thick, sirupy liquid having a golden or yellowish-brown color, a sweetish taste, and the odor of malt. If properly prepared, it contains, besides the constituents of barley, the ferment *diastase*. It is much prescribed for its restorative qualities, and as a vehicle for cod-liver oil. It is best administered immediately after meals.

**PARALDEHYDE** has recently attracted so much attention as an anodyne and hypnotic, that some reference to it becomes necessary. Under this name is described a polymeric modification of aldehyde. Above the temperature of 51° Fahr. it is a colorless liquid, having a peculiar ethereal odor, and a specific gravity of .998. It boils at about 225° Fahr. It is soluble in eight parts of water at 52° Fahr. The dose ranges from ʒ ss to ʒ ijss. Water is a suitable menstruum.

In appropriate cases it has proved to be an admirable hypnotic, with many of the qualities but none of the dangers of chloral. In its action, first the cells of the cerebrum are affected, and sopor is induced. Unlike the other agents of this class, its soporific action is not preceded by excitement (Cervello). Next to the cerebral hemispheres the effects of paraldehyde are expended on the medulla oblongata, and then on the spinal cord. A lethal dose stops the functioning of the medulla and the respiratory center, but the cardiac functions cease after the respiratory. It differs from chloral in the important respect that it has no paralyzing action on the heart. The effect of paraldehyde is, however, not so persistent as that of chloral, but the frequent repetition of the former with safety is more than a sufficient compensation for the greater power of the latter (Albertoni).

Paraldehyde may be prescribed as a hypnotic in the conditions usually requiring such a remedy—in *fevers*, *rheumatism*, *gout*, *prurigo*, etc. (Morselli). It is, however, in mental and nervous disorders that it is likely to be most employed. By the Italian physicians, to whom

we owe its introduction, it has been very successfully used in *acute mania*, in the wakefulness of *dementia paralytica*, in *hysterical seizures*, and in ordinary *insomnia*. To succeed, it must be given in sufficient quantity. The maximum dose mentioned above (ʒ ijss) has often been given without any ill effect or any after-trouble of any kind.

**Æther.**—Ether. *Éther*, Fr.; *Aether*, Ger.

A liquid composed of about seventy-four per cent of ethyl oxide, and about twenty-six per cent of alcohol containing a little water. Specific gravity about 0.750 at 60° Fahr. (U. S. P.)

**Æther Fortior.**—Stronger ether. A liquid composed of about ninety-four per cent of ethyl oxide, and about six per cent of alcohol containing a little water. Specific gravity not higher than 0.725 at 60° Fahr.

A thin, very diffusive, clear, and colorless liquid, of a refreshing, characteristic odor, a burning and sweetish taste, with a slightly bitter after-taste, and a neutral reaction. It is soluble in all proportions in alcohol, chloroform, benzol, benzin, fixed and volatile oils, and dissolves in eight times its volume of water at 60° Fahr. It boils at 98.6° Fahr. Ether is highly inflammable, and its vapor, when mixed with air and ignited, explodes violently. (U. S. P.)

**Spiritus Ætheris.**—Spirit of ether. Consists of ether, thirty parts; alcohol, seventy parts. Dose, ℥ x—ʒ j.

**Spiritus Ætheris Compositus.**—Compound spirit of ether. Hoffman's anodyne. (Ether, alcohol, and ethereal oil.) A colorless, volatile, inflammable liquid, having an aromatic, ethereal odor, and a burning, slightly sweetish taste. Its specific gravity is 0.815. It is neutral, or but slightly acid to litmus. It gives only a slight cloudiness with chloride of barium; but when a fluid ounce of it is evaporated to dryness with an excess of this test, it yields a precipitate of sulphate of barium, which, when washed and dried, weighs six and a quarter grains. When a few drops are burned on glass or porcelain, there is no visible residue, but the surface will have an acid taste and reaction. A pint of water, by the admixture of forty drops, is rendered slightly opalescent. Dose, ℥ x—ʒ j. (Pharm. 70.)

**Spiritus Ætheris Nitrosi.**—Spirit of nitrous ether. Sweet spirit of nitre. An alcoholic solution of ethyl nitrite, containing five per cent of the crude ether. (U. S. P.) Is a volatile, inflammable liquid of a pale-yellow color, inclining slightly to green, having a fragrant, ethereal odor, free from pungency, and a sharp, burning taste. It slightly reddens litmus, but does not cause effervescence when a crystal of bicarbonate of potassium is dropped into it. When mixed with half its volume of official solution of potassa previously diluted with an equal measure of distilled water, it assumes a yellow color, which



slightly deepens, without becoming brown, in twelve hours. A portion of the spirit in a test-tube half filled with it, plunged into water heated to 145°, and held there until it has acquired that temperature, will boil distinctly on the addition of a few small pieces of glass.

Spirit of nitrous ether has a specific gravity of 0.837, and contains five per cent of its peculiar ether. It should not be long kept, as it becomes strongly acid by age. Dose, ʒ ss—ʒ ss.

*Æther Aceticus.*—Acetic ether. Acetate of ethyl. A transparent and colorless liquid, of a strong, fragrant, ethereal, and somewhat acetous odor, a refreshing taste, and neutral reaction. Soluble in all proportions in alcohol, ether, and chloroform, and in about seventeen parts of water. Specific gravity, 0.889 to 0.897. It is inflammable. Dose, ℥ x—ʒ j.

*Æthyl Bromide.*—Hydrobromic ether. Is a colorless liquid, volatile, having a fragrant odor, and a hot, somewhat sweetish taste, afterward rather bitter. It is not inflammable. Its specific gravity is 1.420, and it boils at 104° Fahr.; readily decomposes on exposure to light and air, bromine being separated. It is freely soluble in alcohol and ether, but very sparingly in water. Dose, for internal and subcutaneous administration, ℥ x—ʒ j.

ANTAGONISTS AND INCOMPATIBLES.—Ether dissolves iodine, bromine, corrosive sublimate, the volatile and fixed oils, many resins and balsams, tannin, caoutchouc, most of the alkaloids, sulphur, and phosphorus—the last-named two sparingly. As respects its stimulant and anodyne properties, it is antagonized by arterial sedatives, quinine, oxygen, protoxide of nitrogen, the tetanizing alkaloids, strychnine, picrotoxin, etc.

SYNERGISTS.—Alcohol and its congeners, chloroform, arterial stimulants, cerebral stimulants, etc., assist the action of ether.

PHYSIOLOGICAL ACTIONS.—The physiological effects of ether when inhaled require separate treatment; hence the subject of anæsthesia by vapors will be discussed in a special article. It is now proposed to treat of the effects of ether administered by the usual route—the stomach.

Ether has a taste at first sweetish, but afterward hot and pungent. It leaves a cooling sensation in the stomach after the subsidence of the burning, and this quickly diffuses over the body. Increased action of the heart, flushing of the face, warmth of the surface, with increased diaphoresis, follow in a few minutes. The senses are quickly excited, the mind becomes more active, ideas flow rapidly, and the cerebral phenomena of alcoholic intoxication ensue. These effects are of short duration, and a feeling of content, mental calm, and sopor, succeeds to the transient excitement. Ether is eliminated rapidly, chiefly by the lungs, and the whole duration of the effects of even a large quantity (ʒ ij) does not exceed an hour.

THErapy.—Before it is administered, ether should be diluted with alcohol, which renders it readily miscible with water.

A few drops of Hoffman's anodyne (℥ x—℥ xx) in some camphor-water is an excellent remedy to expel *flatus* from the stomach. *Gastralgia* may often be quickly relieved by the same means. A few drops of ether, added to cod-liver oil, enable the stomach to bear it more easily, and, it is said, favors its digestion; that it accomplishes this object by increasing the pancreatic juice, is the observation of Claude Bernard. Paroxysms of *hepatic colic* are sometimes treated by the internal administration of ether, but this treatment is by no means equal in effectiveness to the inhalation of the vapor. Ether mixed with turpentine has the power to dissolve *hepatic calculi*, hence the remedy of Durande. As Trousseau well remarks, chemical results which take place in the laboratory are not reproduced in the body with equal facility. The rapidity with which ether diffuses into the blood at the temperature of the stomach would appear to preclude the possibility of its exerting any solvent action on a calculus fixed in an hepatic duct. Whatever good result is secured by the administration of the remedy of Durande must be ascribed to the anodyne and antispasmodic action of its constituents.

*Sudden failure of the heart's action* (syncope), from mental emotion or hysteria, is most promptly remedied by the administration of Hoffman's anodyne. Mild attacks of *angina pectoris*, and of *spasmodic asthma*, may sometimes be aborted by a full dose of the ethereal preparations. The subcutaneous injection of ether is very effective in sudden cardiac depression.

*Nervous or hysterical sick-headache* is quickly cured by ʒ ss doses of spirit of ether. The most important application of these ethereal remedies is in the treatment of the *hysterical paroxysms*. As the action is prompt and quickly expended, it is obvious that ether or Hoffman's drops are only adapted to sudden hysterical seizures, and not to more lasting nervous symptoms arising in an hysterical constitution. Nothing can be more satisfactory than the prompt relief by these agents of *hysterical flatulence*, *globus hystericus*, and *hystero-epilepsy*. ℞ Spts. etheris composit., tinct. valerian. ammon., āā ʒ j. M. Sig.: *A teaspoonful in water every fifteen minutes until relieved.*

As a *cardiac stimulant in fevers*, the ethereal preparations are occasionally prescribed. For a quick effect, in an emergency of practice, they are useful, but are not equal to spirits and wine when a sustained effect is required.

Nitrous ether is employed in domestic practice as a mild *diaphoretic*, a *diuretic*, and *carminative*. It no longer occupies the place it formerly held in medical practice, but it is occasionally prescribed in *feverishness*, as a constituent in *expectorant mixtures*, in combination with *diuretic medicines*, etc.



ETHER BY THE HYPODERMATIC METHOD.—Within the past few years, the subcutaneous injection of ether has taken an important position in therapeutics. It is necessary, therefore, to enter into this subject fully.

When ether is injected beneath the skin, more or less burning pain is felt at the point of insertion, and a puffy swelling is produced. In most subjects this swelling subsides in an hour or two, and no trace is left of the operation. In some instances, an induration, the size of a filbert, forms, and slowly disappears. Very rarely inflammation is set up about the site of the injection, and followed by suppuration, with more or less sloughing. If not too large an amount, suddenly and violently injected, is used, there will be no untoward results.

The effects of ether subcutaneously are the same in kind as, but more powerful in degree than, those produced by the stomachal administration. A local anæsthetic impression is made; in a few seconds, the action of the heart is powerfully increased, and soon the usual cerebral effects are manifest.

Ether was first employed subcutaneously by Dr. Comegys, of Cincinnati, in the treatment of *sciatica*. He injected from fifteen minims to a half-drachm, in the neighborhood of the affected nerve. This practice has been followed by others with success, and is now more or less widely used as a substitute for "the deep injection of chloroform." It is very desirable to have some exact observations which will determine the comparative value of these expedients.

The most important applications of ether, hypodermatically, are as a cardiac stimulant in the case of sudden and extreme depression of the heart, and as a general stimulant in adynamic states. In the depression caused by *hæmorrhage*, whether pulmonary or *post partum*, the injection of ether may obviate the necessity for transfusion. This practice is strongly urged by Peter, Féréol, and Mlle. Ocoumkoff, who report cases in confirmation. Remarkable results have been effected by the subcutaneous injection of ether in *adynamic pneumonia* (typhoid pneumonia), as practiced by M. Barth. Thus, of fourteen cases of severe type treated by these injections, eleven were cured. The quantity injected was about fifteen to twenty minims two, three, or four times a day, according to the degree of adynamia. The effects which follow almost immediately are these: the respiration becomes more easy, the pulse takes on more strength and volume, the tongue moistens, and the countenance assumes a better appearance. In from two to three minutes after the injection has been practiced, the odor of ether is recognizable in the breath (Barth).

In the eruptive fevers, especially in *variola*, the injections of ether have been used with admirable results (Castel). It is in a high degree probable that the same treatment will prove very useful in low forms of septic and inflammatory diseases in general. There can scarcely

be any doubt that we have in this method a most useful addition to our therapeutical resources.

In place of ether, hydrobromic ether has been utilized in the treatment by the subcutaneous method of various spasmodic diseases, as *whooping-cough*, *chorea*, *asthma*, and similar affections.

**Chloroformum.**—Chloroform. *Chloroforme*, Fr.; *Chloroform*, Ger.

*Chloroformum Venale.*—Commercial chloroform. A liquid containing at least 98 per cent of chloroform. It has nearly the same sensible properties as purified chloroform. Its specific gravity should not be lower than 1.470.

*Chloroformum Purificatum.*—Purified chloroform. A heavy, clear, colorless, diffusible liquid, of a characteristic pleasant ethereal odor, a burning sweet taste, and a neutral reaction. Soluble in about two hundred parts of water, and in all proportions in alcohol or ether; also in benzol, benzin, fixed or volatile oils. Sp. gr. 1.485–1.490 at 60° Fahr.

If five cubic centimetres of purified chloroform be thoroughly agitated with ten cubic centimetres of distilled water, the latter, when separated, should not affect blue litmus-paper (absence of acids), nor test-solution of nitrate of silver (chloride), nor test-solution of iodide of potassium (free chlorine). If a portion be digested warm with solution of potassa, the latter should not become dark-colored (absence of aldehyde). If a few cubic centimetres be permitted to evaporate from blotting-paper, no foreign odor should be perceptible after the odor of chloroform ceases to be recognized. (U. S. P.)

When shaken with an equal volume of sulphuric acid, in a bottle closed by a glass stopper, and allowed to remain in contact twenty-four hours, no color is imparted to either. When one fluid drachm is evaporated spontaneously with one drop of a neutral, aqueous solution of litmus, the color of the latter is not reddened. The result of the test is the same if the chloroform contained in a white glass bottle has been previously exposed to direct sunlight for ten hours.

*Mistura Chloroformi.*—Chloroform mixture. Purified chloroform, eight parts; camphor, two parts; fresh yolk of egg, ten parts; water, eighty parts. M. Dose, a tea to a tablespoonful.

*Spiritus Chloroformi.*—Spirit or chloroform. Purified chloroform, ten parts; alcohol, ninety parts. Dose, ʒ ss—ʒ j.

**ANTAGONISTS AND INCOMPATIBLES.**—Chloroform separates from the mixture when prescribed with weak spirits or glycerin. It is soluble in alcohol (ten to six), in ether (one to seven), in water (one to two hundred). It dissolves very freely in olive-oil and turpentine, but does not dissolve in or mix with glycerin. It has very extensive solvent power, dissolving caoutchouc, gutta-percha, mastic, tolu, benzoin, copal, among the gums; iodine, bromine, the organic alkaloids; fixed and volatile oils, resins, and fats. In cases of poisoning by the inter-