process of distilling Arrack, for the purpose of rendering the spirit more intoxicating. The London Porter brewers have been accused of the same pernicious practice.

## OLEA DESTILLATA. L. Ol Volatilia. E.

### Ol. Essentialia. D.

*Distilled, Volatile, or Essential Oils.*

The British pharmacopœiæ direct them to be obtained by distillation only; the French codex orders several of them to be prepared by expression. Qualities. *Form*, liquid, sometimes viscid; *specific grav.* various; oil of turpentine, which is the lightest, being only 0·792, whilst the oil of cloves, cinnamon, and allspice, exceed 1·030, and that of sassafras, which is the heaviest, amounts to 1·094: these latter oils hold resin in solution, and of course sink in water. *Odour*, penetrating and fragrant; *Taste*, acrid; they are volatilized at a temperature somewhat below that of boiling water; they are very inflammable. Solubility. Very soluble in alcohol, forming what are termed in perfumery *Essences;* in water they are very sparingly soluble; the solutions are known in pharmacy under the title of *distilled water;* they are also dissolved by æther, and the *fixed* oils; when digested with ammonia, some of the less odorous acquire a considerable degree of fragrance, whilst on the contrary, fixed alkalies universally impair their odour; they are rapidly decomposed by nitric and sulphuric acids, and their action is sometimes attended with instant inflammation. Volatile oils, from continued exposure to the air, absorb oxygen, and become resinous, by which they lose their volatility, fragrance, and pungency, hence they should be preserved in small opaque phials, completely full and well stopped. Med. Uses. They act as powerful stimulants and aromatics; they remove nausea and flatulence, correct the griping of certain purgatives, and cover the offensive taste of various remedies. See *Aquæ destillatæ*. They, moreover, have the property of defending certain animal and vegetable preparations from mouldiness. This curious fact has been already noticed, *see* page 181. The following is a list of the species admitted into our British pharmacopœiæ; those designated in *italics* are principally for internal use. Olea *Anisi*, *Anthemidis*, *Cari*, *Juniperi*. Lavandulæ, *Menthæ Piperitæ*, *Menthæ viridis*, Origani, *Pimentæ*, *Pulegii*, *Rosmarini*, *L.* Olea Volatilia, *Juniperi communis*, Juniperi Sabinæ, Lavandulæ Spicæ, Lauri Sassafras, *Menthæ Piperitæ*, *Myrtæ*, *Pimentæ*, *Pimpinellæ Anisi*, Rorismarini Officinalis. E. Olea *Juniperi*, *Pimento*, Corticis et Ligni Sassafras, *e Seminibus Anisi*, *Cari*, et *Fœniculi dulcis*, Florum Lavendulæ. Foliorum Sabinæ, *Herbæ florescentis Menthæ Sativæ*, Origani, *Pulegii*, *Rorismarini*, *Rutæ*, D. Adulterations. *Fixed Oils* may be detected by moistening writing paper with the suspected article and holding it before the fire: if the oil be entirely essential, no stain of grease will remain; as castor oil is more soluble in spirit than the others, it is the one generally selected for this fraudulent purpose, and the addition of alcohol restores the sophiscated oil to its proper degree of consistency. *Alcohol* is discovered by adding water, which, if it be present, occasions a milkiness, and at the same time, an increase of temperature; a decrease of bulk also takes place, which may easily be ascertained by measuring the oil and water separately, and then transferring them, in a state of mix-

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ture, into a tube of small diameter. *Cheaper oils*, as that of turpentine, are recognized by their peculiar odour, which may be developed by rubbing a drop upon the hand and holding it to the fire, or, by the dense black smoke with which they burn. The oil of aniseed, as it crystallizes at 50°, is frequently sophisticated with wax, spermaceti, or camphor; the fraud is detected by warming the oil, when the crystals, if genuine, will dissolve.* In some cases the refractive power of the oil affords a test of its purity. *See my work on Chemistry in its relations to Medicine*, § 318.

## OLEA EXPRESSA. L.D.

### Olea Fixa, sive Expressa. E.

*Expressed or Fixed Oils.*

These are obtained from animal matter by fusion, and from vegetable by expression, or decoction with water. Qualities. *Odour*, none; *Taste*, mild; they boil at 600°, but undergo decomposition, becoming acrid and empyreumatic: the oil, in this state, was formerly used in medicine under the name of *philosopher's oil*.† By exposure to air they absorb oxygen and become rancid; they congeal at a temperature of 32°, and some even above that. When the oil is expressed by heating the plates of the press, or by previously roasting the seeds, it is more disposed to become rancid; *cold drawn* oils are on this account to be preferred for the purposes of pharmacy. Solubility. They are insoluble in water, and, except castor oil, nearly so in alcohol and æther; with caustic alkalies they combine and form soaps; when aided by heat they readily unite with oxide of lead, forming the solid compound well known by the term *plaister*. They unite also very readily with each other, and with volatile oils. Solvent Powers. They dissolve sulphur, and form a kind of balsam with it; they also possess the power of extracting and dissolving the narcotic and acrid principles of several vegetable and animal substances, in consequence of which, the French pharmacopœia directs a series of preparations under the term "*Olea Medicata*;" thus there are olea Cicutæ, Hyoscyami, Solani, Stramonii, Nicotianæ;‡ which are made by digesting with a gentle heat, one part of the subject in two parts of olive oil.§

## OLEUM AMYGDALARUM. L.E.D.

*Oil of Almonds.*

This fixed oil, whether procured from the *sweet* or *bitter* almond, has the same properties, for the bitter principle resides exclusively in combi-

* Huiles Antiques. The basis of the best of these oils, is the oil of Ben, from the nuts of the Guilandia Moringa; or oil of hazel, which is a very good substitute, since it is inodorous, colourless, and may be kept for a considerable period without becoming rancid: it is therefore well adapted to receive and retain the odour of those vegetables that yield but a small proportion of essential oil.

† Oil of Bricks. So called because this empyreumatic oil was sometimes obtained by steeping hot brick in oil, and submitting it to distillation.

‡ Roche's Embrocation for the Hooping Cough. Olive oil mixed with about half its quantity of the oils of cloves and amber.

Struve's Lotion for the Hooping Cough. This once famous nostrum consisted of ʒj of Tartarized Antimony, dissolved in fʒij of water, to which was added fʒj of Tincture of Cantharides.

§ The editors have also unaccountably retained the Oleum de Lumbricis!

nation with a peculiar volatile oil attached to the mucilage ; * that from the latter keeps longer without rancidity. It is sometimes made from old Jordan almonds, *by heat*, in which case it very soon grows fetid. Nut Oil, *Oleum nucum Coryli*, has been proposed as a substitute for that of almonds ; in China it is drunk with tea, instead of cream. MEDICAL Uses. For forming emulsions, in coughs, and other pulmonary complaints. FORMS OF EXHIBITION. It may be formed into an *emulsion* by the intermedium of *mucilage*, the *yelk of an egg*, or by that of an *alkali*.

1. BY MUCILAGE. This is in general a more convenient medium than the yelk of an egg ; one part of gum, made into mucilage, will be sufficient for the diffusion of four parts of oil, (see *Mucilago Acaciæ*) the oil and mucilage must be carefully triturated together, and the water then gradually added ; the emulsion thus formed is permanent, and the addition of a moderate quantity of acid, spirit, or tincture, will not produce decomposition. *See Form.* 73.

2. BY ALKALIES. This oil, by uniting with alkalies and water, forms an elegant and grateful mixture for which purpose the following proportions are to be observed, every f℥j of oil requires ♏viij of liquor potassæ, and f℥iss of distilled water. INCOMPATIBLE SUBSTANCES. *Acids ; oxymel ; syrups of poppies and squills ; tartrate and super tartrate of potass ; super-sulphate of potass ; oxy muriate of mercury ; resins ; hard water. See Form.* 166, 167.

## OLEUM AMYGDALÆ AMARÆ VOLATILE.

QUALITIES. *Colour*, pale yellow ; *Odour*, fragrant and pungent, having the characteristic smell of prussic acid. *Taste*, pungent, bitter, and peculiar. SOLUBILITY. *Like other essential oils, its sensible properties and medicinal effects are imparted to water ; in alcohol it is very soluble* † CHEMICAL COMPOSITION. A peculiar oil, combined with hydro-cyanic acid. M. Vogel of Munich has lately succeeded in separating these constituents, by agitating the whole in a concentrated solution of potass, and distilling to dryness ; the oil volatilized together with water, while the residuum in the retort was found to contain *Cyanide of Potassium*. The volatile oil, thus purified, is without odour, and heavier than water. Its taste is extremely acrid and burning ; by contact with air it crystallizes rapidly ; it dissolves easily in alcohol and æther, but only in a very small proportion in water. The flame of its combustion is very brilliant, and accompanied with much smoke. In order to discover whether this oil, when freed from its hydro cyanic acid, is still poisonous, M. Vogel put a drop of it on the tongue of a sparrow, when it died, after violent convulsions, in a few seconds ; he also poisoned a dog two months old, with four drops of it ; whence he concludes that the volatile oil, divested of its hydro-cyanic acid, is still a poison, although less energetic than the oil that has not undergone such a change. MED : USES. It has all the characteristic effects of prussic acid, but is so powerful and dangerous as to preclude its application. It is principally sold to perfumers and confectioners.

* If the plates of the press be heated, the fixed oil from the bitter almond will be odorous.

† ESSENCE OF BITTER ALMONDS. The preparation sold under this name, for the purposes of perfumery, &c. consists of one part of this essential oil, and seven parts of Rectified spirit.

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It is generally obtained by distilling the expressed cake of bitter almonds; the operation however requires considerable pharmaceutical address, and is, moreover, attended with unpleasant consequences.*

## OLEUM OLIVÆ. L.E.D. *Olive Oil.*

Qualities. *Colour*, pale yellow, somewhat inclining to green; *Taste*, bland; *Odour*, none; it ought to congeal at 38° *Fah.* With the exception of the oil of Almonds, it is the lightest of the fat oils, its specific gravity being only 915. According to the recent observations of Dr. Clarke of Cambridge, this oil crystallizes in rectangular four-sided prisms with square bases. Uses. Although much less laxative than Castor oil, it is a useful aperient. It was long regarded, but erroneously, as possessing antidotal powers against the bites of venemous snakes and insects; and it has been confidently recommended in the form of liniment, as a remedy against the Plague. Officinal Preparations. *Linimentum Ammoniæ Fortius.* L. Adulterations. It is not unfrequently mixed with the oil of poppy seeds, (see *Papaveris Capsulæ*), a fraud which may be easily discovered by exposing a sample to the freezing temperature, when the olive oil will congeal, while that of poppies will remain fluid; and since those oils which freeze with most difficulty are most susceptible of rancidity, the admixture of poppy oil must be regarded as injurious: it also deserves notice that the peculiar habitudes of *Oil of Olives*, with the *Pernitrate of Mercury*, offer a distinguishing character, by which the adulteration of the oil may be satisfactorily detected; for if the *pernitrate*, made by dissolving 6 parts of the metal in 7·5 of nitric acid, of sp. grav. 1·36, at a common temperature, be mixed with olive oil, the mixture, if kept cold, will in the course of a few hours become solid, whereas if it has any admixture of the oil of grains, it will not undergo such a change. The contamination derived from lead, which is frequently immersed in the oil for the purpose of removing its rancidity, may be detected by shaking one part of the suspected sample with three parts of water, impregnated with sulphuretted hydrogen, in a stopped phial.

## OLIBANUM. L.D.

Juniperus Lycia. *Gummi-resina.*

### Olibanum.†

Qualities. *Form*, fragments of a translucent, whitish yellow, and generally powdered with a whitish dust, occasioned by the friction of the

* For such reasons there are but few wholesale houses who profess to distil it. I have, however, through the civility and attention of Mr. Johnson, chemist in Oxford-street, who frequently conducts the process on a large scale, had several opportunities of witnessing the interesting phenomena to which it gives rise. So powerful is the odour developed upon these occasions that it fills the premises with an almost insupportable atmosphere, occasioning head-ache, sickness and cough; so that we may safely observe, that, whatever miracles the prussic acid may perform, when applied to the coats of the stomach, its application in the form of vapour to the lungs proves highly irritating to those organs.

The concentrated vapour of this essential oil is almost instantly destructive to animal life. I have seen flies drop lifeless to the floor as they have passed over the still; thus, as it were, realizing in miniature the fabled powers of Avernus.

"Quam super haud ullæ poterant impune volantes
Tendere iter pennis; talis sese halitus atris
Faucibus effundens supera ad convexa ferebat." Æn. VI. v. 239.

† Some authors have considered the olibanum as the Λιβανος quasia Oleum Libani,

pieces against each other: *Odour*, when burning is fragrant; *Taste*, bitterish and acrid. Solubility. When triturated with water, a milky solution results, which after some time deposits the resinous part, and retains not more than three-eighths dissolved. Alcohol dissolves three fourths of it, and forms a solution perfectly transparent. Æther dissolves more than half, leaving a white opaque residuum soluble in water. Chemical Composition. The latest analysis of this substance is by *Braconnot*, who found in 100 part of it, of volatile oil 8, resin 56, gum 39, and of an anomalous principle resembling gum, but insoluble in water and alcohol, 5·2 parts. The oil, in colour and smell, very strongly resembled that of lemons. Med. Uses. It is now less used than formerly; it is however stimulant and diaphoretic. Pulverized it enters into several popular electuaries for gleets, fluor albus, &c. and very probably acts by finding a passage into the urine, without undergoing any change or decomposition.

OPIUM. L.E.D. (Papaver Somniferum.) *Capsularum immaturarum Succus concretus.* (Turcicus.)

*Turkey Opium.**

Two kinds are found in commerce, distinguished by the name of *Turkey* and *East India* Opium.

Qualities. *Form.* Turkey opium occus in flat pieces, of a solid compact texture, and possessing considerable tenacity; *Sp. gr.* 1 336, so that, when compared with the condensed juices of other plants, it is heavy, being exceeded only in this respect by opoponax and gum-arabic. By long exposure to the air it becomes hard, breaks with a glimmering fracture, owing to the presence of a few saline particles, and affords a yellowish powder. It is opaque, tenacious, plastic, adherent to the fingers. *Colour*, a reddish-brown, or fawn. Odour, peculiar, heavy, and narcotic. *Taste*, at first a nauseous bitter, which soon becomes acrid with some degree of warmth. It is inflammable, but yields no narcotic odour on burning. Solubility. It is partially soluble in water, alcohol, æther, wine, vinegar, and lemon juice; when triturated with hot water, five parts in twelve are dissolved, six suspended, and one part remains perfectly insoluble and resembles *gluten*. By long boiling, its soporific powers are impaired and ultimately destroyed: the alcoholic is more highly charged with its narcotic principle than the aqueous solution; but spirit, rather below proof, is its best menstruum. The watery solution when filtered is transparent, and reddens the colour of litmus; it undergoes no change on the addition of alcohol, but precipitates occur from *pure ammonia* and from the *carbonates of fixed alkalies*; from the solutions of *oxy-muriate of mercury*, *nitrate of silver*, *sub-acetate and acetate of lead*, the *sulphates of copper*, *zinc*, *and iron*, and from an *infusion of galls*. Chemical Composition. Resin, gum, bitter extractive, sulphate of lime, gluten, *Narcotine* (*see note*) and a peculiar alkaline body, to which the soporific vir-

(*Thus*) of the ancients, but Dr. Maton has observed that he cannot find any passage in the ancient authors sufficiently precise to corroborate this conjecture. See Abietis Resina.

* the Greeks and Romans attached a very different meaning to the terms Opium and Meconium. The former signified the pure juice (ὀπὸς succus) that flowed from the scarified *poppies*, the latter, the juice obtained by bruising and pressing the poppy heads.

tues of opium are owing, and to which the appropriate name of *Morphia* has been assigned ; and it appears moreover that this new alkaline body exists in combination with an unknown acid, which has therefore been denominated the *Meconic Acid ;* so that the narcotic principle of opium is *Morphia* in the state of a *meconiate*, or perhaps of a *super-meconiate.*

For these important facts we are indebted to the successive labours of Derosne,* Seguin,† Sertuerner ‡ and Robiquet. And the French codex contains, in its appendix, formulæ for the preparation of morphia§ according

* Annales de Chimie, vol. 45. Derosne first obtained a crystalline substance from Opium in the year 1803, which dissolved in acids ; but he did not determine its nature or properties ; in 1804 Seguin† (Ann. de Chim. vol. 92) discovered another crystalline body in opium, and although he described most of its properties he never hinted at its alkaline nature. ‡ Sertuerner at Eimbeck, in Hanover, had at the same time as Derosne and Seguin, obtained these crystalline bodies, (Ann. de Chim. et de Phy. T. v.) but it was not until the year 1817, that he first unequivocally proclaimed the existence of a vegetable alkali, and assigned to it the narcotic powers which distinguish the operation of opium ; to this body he gave the name of Morphia, and it appears to be the same as the essential salt noticed by Seguin. The salt of Derosne, now more usually denominated Narcotine, is quite a different principle, although it was constantly mistaken for one of the salts of Morphia, till M. Robiquet (Ann. de Chim. and de Phy. T. v.) pointed out its distinctive properties. It is an azotized substance, crystallizing in beautiful pearly prisms or tables ; soluble in fixed oil, and still more so in æther and the acids ; insoluble in water, and little soluble in alcohol ; destitute of action on the vegetable colours, and incapable of neutralizing acids. There still exists, however, very considerable confusion with respect to this salt, and farther experiments are required to ascertain its chemical nature, as well as its physiological action.

§ The discovery of an alkaline body in opium induced the French and German chemists to examine the composition of other active vegetables, with a view to detect the existence of an analogous principle ; and their labours have been rewarded with unexampled success. They have accordingly obtained STRYCHNIA from the nut of the Strychnos nux vomica ;—BRUCIA from the bark of the Brucea Anti-dysenterica (False Angustura Bark) VERATRIA from the Veratrum album, V. Sabadilla and Colchicum Autumnale ;—CINCHONIA from the bark of the Cinchona Oblongifolia (Red Bark) ;—QUINA (or Kina) from that of the Cinchona Cordifolia (Yellow Bark) ; —EMETA from the Callicocca Ipecacuanha ;—DELPHIA, from the Delphinium Staphisagria ;—PICROTOXA from the Menispermum Cocculus ;—SOLANA from the Solanum Nigrum, and S. Dulcamara ;—GENTIA, from Gentiana lutea ;—ATROPIA from the Atropa Belladonna ; HYOSCYAMA, from Hyoscyamus Niger. Besides which, Capsicum, Piper nigrum, and Senna, have been said to yield analogous principles of a salifiable character. With respect to most of these alkaline bodies farther experiments are required to establish our confidence ; it is more than probable that several of them will turn out to be disguised modifications of each other ; it has already been questioned whether QUINA and CINCHONIA be not varieties of one alkali ; indeed it is possible that all these bodies may have the same alkaline base, and that they differ from each other in consequence of their combination with other principles, derived from the vegetable in question, and impressing upon the salt its characteristic virtues ; and this idea receives material support from the fact, that they are neutralized by a very small proportion of acid. (See a paper on this subject in the 70th number of the Edinburgh Med. and Surg. Journ.)

They have all many properties in common, such as a degree of bitterness varying in intensity in different species ; they are inodorous ; are not altered by air or light, but are decomposed by a moderate heat ; most of them enter into fusion, but at different temperatures, some for instance at below 212° Fahr. others not until they are about to be decomposed ; HYOSCYAMA will even resist a low red heat. They are very sparingly soluble in water, but they are in general rendered more so by the presence of resinous matter. They are nearly all highly soluble in alcohol. Æther readily dissolves DELPHIA, VERATRIA, EMETA, QUINA, and GENTIA ; but MORPHIA, CINCHONIA, and PICROTOXA, are very sparingly soluble : and STRYCHNIA and BRUCIA are nearly insoluble in it ; they combine with the acids ; and, in general, form neutral salts ; but it appears that VERATRIA and EMETA always unite with an excess

to the directions of these two latter chemists: viz. *Robiquet's* process. Three hundred parts of pure opium are to be macerated during 5 days, in 1000 parts of common water; to the filtered solution, 15 parts of perfectly pure magnesia (carefully avoiding the *carbonate*,) are to be added; boil this mixture for ten minutes, and separate the sediment by a filter, washing it with cold water until the water passes off clear; after which treat it alternately with hot and cold alcohol, (12, 22, Bé.) as long as the menstruum takes up any colouring matter; the residue is then to be treated with boiling alcohol (22, 32, Bé.) for a few minutes. The solution, on cooling, will deposit crystals of *Morphia*.

*Rationale of the Process.* A soluble *Meconiate of Magnesia* is formed, whilst the sediment consists of *Morphia* in the state of mixture, with the excess of magnesia; the boiling alcohol with which this residuum is treated, exerts no action upon the magnesia, but dissolves the *Morphia*, and on cooling surrenders it in a crystalline form. A repetition of the treatment with boiling alcohol will procure a fresh crop of crystals, and the process should be continued until they cease to appear.

*Sertuerner's* method. It differs from the preceding, in substituting ammonia for magnesia, and in adding to the sediment, separated as before mentioned, as much sulphuric acid as is sufficient to convert the *Morphia* into a sulphate, which is subsequently decomposed by a farther addition of ammonia; the precipitate thus produced is then dissolved in boiling alcohol, which on cooling surrenders the *Morphia* in a state of crystalline purity. It appears however that the *Morphia* produced by this latter method, is less abundant and more impure and coloured, than that which is furnished by the process of Robiquet.

*Characters of Morphia.* When pure, it crystallizes in very fine, transparent, truncated pyramids, the bases of which are either squares or rectangles, occasionally united base to base, and thereby forming octohedra. It is sparingly soluble in boiling water, but dissolves abundantly in heated alcohol; and the solution is intensely bitter; in æther it is far less solu-

of acid. All the combinations with the mineral acids, excepting the salts of PICROTOXA, are exceedingly soluble in water; and, with the exception of NITRATE OF CINCHONIA, and all the salts of VERATRIA, they are crystallizable. The acetates too, with a few exceptions, are also soluble, and they are disposed to form super-salts. All the oxalates, except that of PICRATOXA, which is the most soluble of its salts, and all tartrates, are rather insoluble, and have likewise a tendency to unite with an excess of acid. The action of concentrated nitric acid on these alkaline bodies is very peculiar, converting the greater number of them into artificial tannin; but it appears to peroxidate MORPHIA, STRYCHNIA, and BRUCIA, rendering them less powerful as salifiable bases, and diminishing or destroying their action on the animal body. See Edinburgh Med. & Surg. Journ. supra citat.

By analysis, with the deutoxide of copper, these alkalies yield carbon, hydrogen, and oxygen; but no azote, unless they have been obtained by precipitation with ammonia, as in the process of Sertuerner.

It would appear that these bodies exist in their native plants, in combination with peculiar acids; some of them are found in the state of Malates.

With respect to their physiological action it may be stated, that they would appear to concentrate in themselves the characteristic properties of the vegetables to which they belong, and yet, although their effects are much greater than those of the undecomposed vegetables, the same quantity of alkali is not so powerful in its pure form, as in its natural state of combination. Thus one grain of morphia produces no more effect than two grains of Turkey opium, which do not contain more than a sixteenth part of the alkali. To explain this loss of efficacy which usually attends our attempts at concentration, the reader is referred to the observations which have been already offered upon this subject in the first part of this work, page 157.

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ble. It has all the characters of an alkali ; affecting test papers, tinged with turmeric or violets ; uniting with acids, and forming neutral salts, and decomposing the compounds of acids with metallic oxides. It unites with sulphur by means of heat, but the combination is decomposed at the same instant : it is incapable of forming soap with an oxidized oil. It fuses at a moderate temperature, when it resembles melted sulphur, and like that substance, crystallizes on cooling ; it is decomposed by distillation, yielding carbonate of ammonia, oil, and a black resinous residue, with a peculiar smell ; when heated in contact with air, it inflames rapidly ; the voltaic pile exerts but little action upon it, yet, when mixed with a globule of mercury, the latter appears to become increased in bulk, and to change consistence. When analyzed by means of the deutoxide of copper, it yields carbon, hydrogen, and oxygen ; and if ammonia has been employed, as a precipitant in its preparation, we shall also obtain some nitrogen, but not if prepared according to the improved process of Robiquet. Its habitudes with different bodies have not hitherto been sufficiently investigated, but they are highly important, in as much as they will explain the operation of those medicinal compounds, into which opium enters as a principal ingredient. *Sertuerner* has given us an account of the effect of the alcoholic solution of Morphia on himself and three of his pupils ; he found, that repeated small doses of half a grain produced at first decided excitation ; then weakness, numbness, and tendency to fainting ; after swallowing vinegar while in this condition, violent vomitting was excited, profound sleep intervened in one delicate individual, and next day he suffered from nausea, vomiting, head-ache, anorexia, constipation, and heaviness (*Ann. de Chim. et de Phys.* T. v.) This case is sufficient to show that although Morphia possesses the characteristic powers of opium, its strength is by no means commensurate with its supposed concentration. When uncombined it exerts little or no action in consequence of its insolubility. The following history of its saline compounds may be useful.

The *Carbonate* crystallizes in short prisms.

The *Acetate* in needles, very soluble, and extremely active.

The *Sulphate*, in arborescent crystals, very soluble.

The *Muriate*, in plumose crystals, much less soluble ; when evaporated, it concretes into a shining white plumose mass on cooling.

The *Nitrates*, in prisms grouped together.

The *Meconiate*, in oblique prisms, sparingly soluble.

The *Tartrate*, in prisms.

Morphia is separated from the above combinations by ammonia.

Morphia is very soluble in olive oil, and according to the experiments of M. Majendie, the compound acts with great intensity ; with extractive matter, it forms a compound which is almost insoluble in water, but very soluble in acids.

The solubility of Morphia in acids explains why the administration of vinegar increases the powers of opium, (*see* page 139.) *M. Majendie* considers Morphia to produce a more purely soporose effect than opium, and that it is moreover exempt from the consecutive operation which so generally renders opium objectionable. This opinion, however, has not been confirmed by the trials made in this country : equally gratuitous is the assertion of the same physiologist, that by ringing changes on the salts of Morphia, its hypnotic effects may be kept up without increasing its dose.

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As *M. Majendie* considers the *after* effects of opium to be independent of Morphia, it was necessary for him to point out the particular principle from which these noxious consequences arose, and he accordingly ascribed them to the *Salt of Derosne*, now more usually denominated *Narcotine*, and which may be entirely removed from the extract of opium by macerating it in sulphuric æther ; and in this way, it is said, a preparation is obtained, which, like Morphia, is exempt from the occasional bad consequences of the common drug ; but no satisfactory trials have as yet been made with it.

The *Meconic Acid*, when separated from the residuum of the magnesian salt, as described above, does not appear to possess any medicinal activity. Its distinguishing *chemical* character is, that it produces an intensely red colour in solutions of iron oxidized *ad maximum*.

East India Opium is an inferior species ;* it differs from *Turkey Opium*, in its *texture* being less compact, and much softer ; its *colour* darker ; its narcotic *odour* fainter, but combined with a strong empyreuma, and in its *taste* being more bitter, but less acrimonious. According to the experiments of Mr. A. T. Thomson, *Turkey Opium* contains three times more morphia than the *East Indian* variety. This latter, when triturated with water, is taken up without any residuum ; hence it contains no gluten, but the sulphate of lime is more abundant, as appears from the relative proportion of precipitate produced by oxalic acid. The solution of the acetate of barytes, whilst it occasions no disturbance in the solutions of the Turkey variety, produces a copious precipitate with the East Indian.

Med. Uses. Are so well known that a few practical remarks will suffice.†

*Chemistry, it appears, has developed the principle of its activity, and accumulated experience has established the value and importance of its* medicinal applications, but Physiology is still unable to demonstrate the manner in which it produces its effects. It must be admitted that its primary operation is that of a powerful and diffusible stimulant, but it is immediately followed by narcotic and sedative effects, which are far greater than could have been inferred from the degree of previous excitement, and hence much keen controversy has arisen in the schools concerning its *modus operandi*, (*see* page 78.) In large doses, the primary excitement is scarcely apparent, but the powers of life are instantly depressed, drowsiness and stupor succeed, and when the dose is excessive, these are followed by delirium, stertorous breathing, cold sweats, convulsions, and apopletic death. Its stimulant effects are apparent only in small doses, by which the energy of the mind‡ the strength of

* The manufacture, however, of Indian Opium has been of late years greatly improved by Dr. Fleming, under whose superintendance that important department was placed by the Marquis Wellesley.

† Forty thousand pounds weight of Opium are annually imported into the port of London.

‡ It has been stated in the Historical Introduction to this work, (page 8,) that the nepenthe, which Helen mixed with wine, and gave to the guests of Menelaus, was probably opium ; such was the opinion of Sprengel, expressed in his *History* of Botany. Other authors have entertained a different belief. Delile, in his "Flora Egyptiaca," considers it to have been a preparation of hyoscyamus albus. Dr. Christen, in his late elaborate dissertation on Opium, agrees with Forbes, who states, in his Oriental Memoirs, that in Hindostan Bendsch, i. e. nepenthe is prepared from the cannabis sativa of *Linnæus*. Lindner informs us that bangue is prepared from the dried leaves

the pulse, and the heat of the body, are considerably increased, but all the secretions and excretions, except the cuticular* discharge, are diminished ; for example, the fæces of persons, after the use of opium, are not unfrequently clay-coloured, from the suspension of the biliary secretion ; this circumstance suggests some important precautions with respect to its exhibition. Opium, when properly directed, is capable of fulfilling two great indications ; 1st, of supporting the powers of life, and 2nd, of allaying spasm, pain, and irritation, and of blunting that morbid susceptibility of impression, which so frequently attends fever. Its use is contra-indicated in all cases where inflammatory action prevails, as in pulmonary affections, attended with an accelerated circulation and a dry hard cough.† It is employed by some of the oriental nations for the same purposes that we take spirituous potations : by the Turks especially, to whom our more generous beverages are prohibited by religious prejudice, opium is solicited to inspire courage, or to invigorate fortitude ;—to soothe sorrow ;—or to dissipate the remembrance of misfortune ;—to awaken the fancy to more brilliant exertions ; or to create that mild composure and serenity of feeling, which is desirable after the cares and solicitudes of an active, perplexing, and arduous scene : like spirituous liquors among other people, it is, in short, the support of the coward,—the solace of the wretched,—and the daily source of intoxication to the debauchee. Notwithstanding all this, spirit and opium are by no means parallel medicines ; on the contrary, the latter substance offers the best remedy for the *Mania a Potu*, and in cases of habitual drunkenness from alcohol, where our wish is to abstract the spirit, but are for obvious reasons unable so to do, we may frequently alternate its use with that of opium, with considerable advantage. Many of the beneficial effects of this remedy are to be referred to its power of allaying irritability ; Sir G. Blane has remarked, that in ill-conditioned ulcers in the West Indies, opium was found superior to all other internal medicines for producing a disposition to heal. Under the free use of it, such ulcers would in place of a sanious discharge produce a healthy pus succeeded by granulations and cicatrization. It appears to do this by suspending irritation, and perhaps by promoting absorption.

of the wild cannabis, the smoke of which is said to be more narcotic than even that of opium. There seems, however, to be good reason for supposing that Indian bangue is a compound of several ingredients. Ray says that he learned from Sir Hans Sloane, that the principal ingredient was not hemp, but a plant somewhat like it.

* The operation of Opium is not unfrequently attended with an itching, or sense of pricking of the skin, which is sometimes terminated by a species of miliary eruption.

† Opium is the Quack's sheet anchor. The various nostrums advertised as "Cough Drops, for the cure of colds, asthmas, catarrhs, &c." are preparations of Opium very similar to paregoric elixir. Pectoral Balsam of Liquorice, and Essence of Coltsfoot, are combinations of this kind. Grindle's Cough Drops, are a preparation of the same description, only made with Rectified, instead of Proof Spirit, and consequently more highly charged with stimulant materials. "The mischief," says Dr. Fothergill, "that has proceeded from the healing anodynes of quacks can be scarcely imagined ; for in coughs, arising from suppressed perspiration, or in inflammatory diathesis, Opiates generally do harm.

Squire's Elixir. Opium, camphor, serpentaria, sub-carbonate of potass, anise and fennel seeds, made into a tincture, and coloured with cochineal.

Ford's Balsam of Horehound. This nostrum may very properly be classed under the present head. It consists of an aqueous infusion of horehound and liquorice root, with double the proportion of proof spirit or brandy ; to which is then added, opium, camphor, benzoin, squills, oil of aniseed, and honey.

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In combination, the medical powers of opium are wonderfully extended, so that there is scarcely a disease in which it may not, during some of its stages, be rendered useful. By diminishing the sensibility of the stomach and bowels, it becomes a valuable and efficacious *corrigent* to many important medicines, and thus frequently favours their absorption and introduction into the system, as for instance, in the exhibition of mercurial alteratives, (*Form.* 141), and in certain diuretic combinations, (*Form.* 100, 106, 107, 110) in combination with antimonials, and with ipecacuan, its narcotic powers are obviated, and sudorific results are obtained. See *Pulv. Ipecac. co.* (*Form* 117, 119, 124, 125, 127, 130.) Forms of Exhibition. In substance, or under the form of tincture. When we wish to continue the operation of opium, and not to obtain its full effect at once, it may be advantageously combined with some substance capable of retarding its solution in the stomach, as *gum resins*. See *Pilulæ* and *Form.* 10, 11, 12, 13. A watery infusion, made by infusing powdered opium in boiling water, will often operate without producing that distressing nausea and head-ache which so frequently follow the use of this substance. With respect, however, to the best modes of correcting the operation of this remedy, *see* page 165 and 166. Dr. Porter of Bristol has introduced to our notice a solution of opium in citric acid; his formula* for its preparation is subjoined, because I am of opinion that it merits the attention of the practitioner; I have lately submitted it to the test of experience, and it certainly possesses the merit of a powerful anodyne, operating with less disturbance than the more ordinary forms of this substance. I also take this opportunity of stating, that the *pyro-ligneous acid* manufactured by Beaufoy was used as a menstruum, and the effect of the solution was similar to that of Dr. Porter. When the stomach rejects altogether the internal exhibition of opium it may be successfully applied along the spine, by friction, with the camphor liniment; a piece of solid opium introduced into the rectum, or dissolved in some appropriate solvent, and injected as an enema, affords also considerable relief in spasmodic affections of the bowels, and in painful diseases of the prostrate gland, or bladder, (*Form.* 9). When thus introduced into the rectum, it cannot undergo that change which the digestive organs produce upon it, and consequently it is more uniform in its action than when presented to the stomach. Opium appears to be readily obsorbed into the system when applied to the surfaces of sores; considerable relief has been thus afforded to irritable stumps, after amputation, on which occasions, all the characteristic effects of opium have been produced upon the system, such as costiveness, head-ache, nausea, &c. Incompatible Substances. *Oxymuriate of mercury; acetate of lead; alkalies; infusions of galls*, and *of yellow cinchona*. Orfila states that the decoction of *Coffee* is less energetic as an antidote, than the infusion. When we intend the opium to act as a sedative, we should not combine it with stimulants. The Edinburgh College certainly erred in this respect, when they made pepper an ingredient in their *Pilulæ Opiatæ*. In combination with vegetable acids, its narcotic powers are increased, in consequence of the formation of

* Liquor Morphii Citratis. ℞ Opii Crudi Optimi ʒiv; Acidi Citrici (Cryst:) ʒij: semel in mortario lapideo contunde, dein aquæ distillatæ bullientis oj affunde; et intime misceantur; macera per horas viginti quatuor; per chartam bibulosam cola.

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soluble salts with *morphia*.* When the opium however has passed out of the primæ viæ, vinegar and acids are then the best remedies for

* The Black Drop, or The Lancaster, or Quaker's Black Drop. This preparation, which has been long known and esteemed, as being more powerful in its operation and less distressing in its effects than any tincture of opium, has until lately been involved in much obscurity; the papers however of the late Edward Walton, of Sunderland, one of the near relations of the original proprietor, having fallen into the hands of Dr. Armstrong, that gentleman has obliged the profession by publishing the manner in which it is prepared, and is as follows:—"Take half a pound of opium sliced; three pints of good verjuice (juice of the wild crab,) and one and a half ounce of nutmegs, and half an ounce of saffron. Boil them to a proper thickness, then add a quarter of a pound of sugar, and two spoonsful of yeast. Set the whole in a warm place near the fire, for six or eight weeks, then place it in the open air until it becomes a syrup; lastly, decant, filter, and bottle it up, adding a little sugar to each bottle." One drop of this preparation is considered equal to about three of the Tincture of Opium. P. L. It would appear that an Acetate of Morphia is formed, which is more active, and less distressing in its effects, than any other narcotic combination.

The French Codex contains directions for preparing a compound very similar to the Black Drop; viz.

Vinum Opiatum Fermentatione Paratum, or Guttæ seu Laudanum Abbatis Rousseau. Take of white honey twelve ounces; warm water, three pounds; dissolve the honey in the water, pour it into a matrass, and set it aside in a warm place; as soon as fermentation has commenced, add four ounces of good opium, having previously dissolved, or rather diffused it in twelve ounces of water; allow them to ferment together for a month, then evaporate until ten ounces only remain, filter, and add four ounces and a half of alcohol.

Liquor Opii Sedativus. Under this name, Mr. Battley, a manufacturing druggist, of Fore-street, London, has offered for sale a narcotic preparation, which it is generally supposed owes its efficacy to the acetate of morphia; on being kept, however, I found that it underwent some important change, during which so much air was disengaged as to blow out the cork from the bottle with violence. This is an objection to its admission into practice, unless we can ensure recently prepared portions as often as they may be required.

In publishing the above statement, I have unfortunately been the cause of much unnecessary Ink-shed. A letter, by Mr. Battley, has been industriously circulated through the different ranks of the profession, purporting to be an apology for his preparation, but after a careful perusal of it, instead of being able to discover any argument in its favour, we receive a *full acknowledgment of the validity of the objection* above stated. "I explained to Dr. Paris, that the liability of the solution to undergo change, was a defect in the preparation, but that the addition of a little spirit would prevent decomposition," and yet in the next sentence he tells us that in those cases in which it is most beneficial, "the addition of spirit would be highly improper." See Medical Repository, vol. xiii. p. 273.

But the circumstance which has excited the greatest indignation in the mind of Mr. Battley, is my having applied the term nostrum to his preparation. Every medicine that is prepared by a secret process, and sold for the private advantage of an individual, is properly designated a nostrum. And I am at a loss to discover any features in the present case that can entitle it to be considered as an exception to this general rule; but perhaps Mr. Battley is inclined to be hypercritical, and as the preparation is not indebted to him, but to Wedelius or Le Mort, for its origin, is prepared to exclaim with the Roman Poet:

"Quæ non fecimus ipsi vix ea nostra voco."

Mr. Battley also complains bitterly of my having inserted his preparation under so odious a motto as "Arcana Revelata fætent," for my own part I cannot conceive any thing more appropriate to the case, viz. Arcana, *these secret preparations*, revelata, *exposed to the air*, fætent, *grow fœtid*. But, notwithstanding the objections which I have thus felt it my duty to offer, I am disposed to speak favourably of its mild and uniform effects, and in justice to Mr. Battley, I will further state that the same opinion has been formed by a great number of respectable practitioners. The late Mr. Haden, who during his protracted illness took a large quantity of this preparation, states, in his Translation of the Formulary of Dr. Majendie, that it is devoid of exciting, and

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counteracting its effects ; (see *page* 139). Dose, must be varied according to the intention of the prescriber, the constitution of the patient, and the nature of the disease. A quarter of a grain, frequently repeated, will keep up its exhilarating influence ; (*Form.* 15) from gr. j to ij acts as a narcotic ; its power on the system soon becomes weaker ; and from habitual use it is so much impaired that very large doses are required to produce its usual effects. Russel observes that the effects of opium on those addicted to its use, are at first obstinate costiveness, succeeded by diarrhœa and flatulence, with loss of appetite and a sottish appearance ; the teeth decay, the memory fails, and the unhappy sufferer prematurely sinks into the grave. Officinal Prep. Gr. j of opium is contained in *Confect. Opii.* L. grs. 36. *Elect. Opii.* E. grs. 43. *Elect. Catechu.* E. grs. 193. (**F**.) *Elect. Catechu. comp.* D. grs. 199. (**F**.) *Pil. saponis cum opio.* L. grs. 5. *Pil. Opiat.* E. grs. 10. *Pil. e Styrace* D. grs. 5. *Pulv. Corn. ust. cum Opio.* L. grs. 10. *Pulv. Cret. comp. cum Opio.* L. grs. 40. *Pulv. Ipecac. comp.* L. E. grs. 10. (**H**.) *Pulv. Kino. comp.* L. grs. 20. (**F**.) *Tinct. Opii.* L. ♏ 19. *Tinct. Camphor. comp.* L. f℥ss. *Tinct. Opii ammon.* E. f℥j. *Troch. Glycyrr. cum Opio.* E. ℥j. *Vinum Opii* L. ♏ 17. The Medicinal Dynameter will at once shew the quantity of opium in any proportion of the above preparations. Adulterations. The *Turkey Opium*, when good, is covered with leaves, and the reddish capsules of some species of *rumex;* the inferior kinds have none of these capsules adhering to them. It is frequently adulterated with the extract of liquorice ; it should be regarded as bad when it is very soft and friable, of an intensely black colour, or mixed with many impurities, when it has a sweetish taste, or marks paper with a brown continuous streak when drawn across it, or when it melts like wax, and makes a yellow solution in water. It frequently happens that in cutting a mass of opium, bullets and stones have been found imbedded in it, a fraud which is committed by the Turks, from which the retailer alone suffers. It is also adulterated with the extract of poppy capsules, or of the whole plant ; with that of *chelidonium majus*, with gum arabic or tragacanth, with the oil of linseed, and even with the dung of oxen.

## OVUM. L. (Phasianus Gallus. *Ovum.*)

### *The Egg of the Domestic Fowl.*

Vitellus. The *Yolk* or *Yelk*, is principally employed in pharmaceutical operations, for rendering oils and balsams miscible with water. It is gently laxative.

*Oleum e vitellis*, Oil of Eggs. Obtained by boiling the yelks, and then submitting them to pressure ; fifty eggs yield about 5 oz. of oil. It is introduced into the Paris Pharmacopœia, being much employed on the Continent for *killing* mercury.

Albumen. Used principally for clarifying turbid liquors.

Testa. Similar to other absorbents.

almost of constipating, properties. He made a very good substitute, " by macerating the dregs, remaining after making tincture of opium, in a solution of Tartaric acid." The preparation formed a tolerably deep tincture, and 40 drops acted, he thought, in all respects, like 20 of the liquor opii sedativus. It neither stimulated, nor produced costiveness.

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## OXYMEL SIMPLEX. L.D. Mel Acetatum. P.L. 1787.

*Simple Oxymel.**

This composition of honey and acetic acid has been long valued on account of its detergent qualities, and has accordingly been much used as the basis of gargles, and expectorant remedies.

## OXYMEL SCILLÆ. L.D. Oxymel Scilliticum. P.L. 1720. 1745.

*Oxymel of Squills.*

This preparation certainly possesses considerable powers as an expectorant; especially if allowed to pass slowly over the fauces, as when applied in the form of a linctus, (*Form*: 135,) which by stimulating the top of the trachea may possibly act, by a kind of "*contiguous sympathy*," upon the pulmonary structure,† and thereby increase the activity of the exhalant vessels, and so dilute the mucus contained in the follicles as to cause it to be poured out in a less viscid form, and consequently in a state to be more easily brought up by expectoration. Its action will also admit of another explanation, but for this *see* page 105. Dose from ƒ℥ss to ƒ℥ij. In larger doses it is given for the purpose of exciting vomiting, especially in hooping cough.

## PAPAVERIS CAPSULÆ. L.E.D.

(Papaver Somniferum. *Capsulæ Maturæ.*)

*Poppy Capsules*, or *Poppy heads.*

These capsules are employed in medicine for the purpose of affording a decoction, to be applied as an anodyne fomentation, see *Decoctum Papaveris*, and as a syrup of hypnotic qualities, see *Syrupus Papaveris.*

The seeds of the poppy capsules are not directly used for any medicinal purposes, but they yield a fixed oil which is daily met with in the market, and is frequently used to adulterate *Olive Oil*, which see. As an article of trade it is considered very inferior to the other fixed oils; it burns very badly, and yields a great quantity of smoke. To the pharmaceutic chemist it is an article of interest from the controversies to which it has given origin‡.

* Godbold's Vegetable Balsam. In the specification of the Patent for this nostrum forty-two different vegetables are directed to be distilled "for the purpose of extracting their essences, which are to be preserved separately and apart from each other, in syrups, and are to be mixed with the following gums and drugs, viz. Gum Dragon, Gum Guaiacum, Gum Arabic, and Gum Canada, these being dissolved in double distilled vinegar, with a quantity of Storax dissolved in Spirits of Wine and Oil of Cinnamon. It is to be bottled off, and kept three years before it is fit to be administered for the Cure of Consumption, or any Asthmatic Complaint." It is hardly necessary to observe, that no such directions ever are, or indeed ever could be followed; in short the "Balsam," is little else than simple oxymel. It is, however, not a little curious that amongst the forty-two plants enumerated, there should be several that would on distillation yield Prussic acid, such as the Bays. We wonder that this accidental circumstance has not been noticed, and turned to account, by some of those worthy disciples of Esculapius who live by the credulity of mankind, and, as Falstaff expresses it, "Turn diseases to a commodity."

† It is in this manner, I apprehend, that stimulating syrups will frequently remove hoarseness.

‡ Although it has been long known that the seeds of the poppy, and the oil obtained from them by expression, do not possess any of the narcotic properties of the plant, and