

carminatives belong to the aromatic oils, alcohols or ethers, and are named in the following list:—

Asafetida.	Mace.	Oil of Cloves.
Camphor.	Mustard.	Oil of Coriander.
Capsicum.	Pepper	Oil of Eucalyptus.
Cardamom.	Serpentaria.	Oil of Fennel.
Chloroform	Spirits.	Oil of Peppermint.
Ether.	Oil of Anise.	Oil of Spearmint.
Fennel.	Oil of Cajuput.	Oil of Nutmeg.
Ginger.	Oil of Caraway	Oil of Pimento.
Horse-radish.	Oil of Cinnamon.	Oil of Valerian.

Cathartics or Purgatives (*καθαίρω, purgo*, I cleanse),—are agents which increase or hasten the intestinal evacuations. According to their respective degrees and direction of action they are subdivided into several groups, as follows:—

Laxatives (*laxo*, I loose), or **Aperients** (*aperio*, I open),—include those which excite moderate peristalsis, and produce softened motions without irritation. *Sulphur* is the typical laxative.

Simple Purgatives,—cause active peristalsis, and stimulate the secretions of the intestinal glands, producing one or more copious and semifluid motions with some irritation and griping. *Senna* is the type of this group, which also includes Aloes, Rhubarb, Castor Oil, etc.

Drastic Purgatives (*δράσω*, to draw),—act still more intensely, producing violent peristalsis and watery stools, with much griping pain, tenesmus, and borborygmi. They irritate the intestinal mucous membrane, cause exosmosis of serum from its vessels, and in large dose set up inflammation and symptoms of irritant poisoning. *Jalap* is a typical drastic.

Saline Purgatives.—This group includes the neutral salts of metals of the alkalis or alkaline earths. They stimulate the intestinal glands to increased secretion, and by their low diffusibility impede reabsorption, causing an accumulation of fluid in the intestinal tract, which, partly from the effect of gravity and partly by gentle stimulation of peristalsis excited by distention, reaches the rectum and produces a copious evacuation. *Magnesium Sulphate* and *Sodium Sulphate* are the typical salines. They should be given in plenty of water and during active movement (as in walking) in order to produce their best effects.

Hydragogue Purgatives (*ἕδωρ*, water, *ἄγω*, I bring away),—include the most active of the drastic and saline groups, especially those which remove a large quantity of water from the vessels. *Elaterium* is a typical hydragogue cathartic.

Cholagogue Purgatives (*χολή*, bile, *ἄγω*, I bring away),—are those agents which stimulate the discharge of bile and produce free purgation at the same time, the stools being green-colored ("bilious") and liquid. *Podophyllin* is the type of this group.

The principal Cathartics are the following-named:—

Laxatives.

Sulphur.
Magnesia.
Cassia.
Manna.
Figs. Prunes.
Tamarinds.
Honey.
Cascara Sagrada.
Physostigma.
Ergot.
Belladonna.
Stramonium.
Hyoscyamus.
Almond Oil.
Olive Oil.
Soap.
Taraxacum.
Glycerin.
Oatmeal.
Bran Biscuit.
Brown Bread.

Simple Purgatives.

Senna.
Aloes.
Rhubarb.
Castor Oil.
Rhamnus Frangula.
Ox-gall.
Calomel.
Small doses of drastics, salines or cholagogues.

Saline Purgatives.

Magnesium Sulphate.
Magnesium Citrate.
Potassium Sulphate.
Potassium Tartrate.
Potassium Bitartrate.
Sodium Sulphate.
Sodium Phosphate.
Sodium Chloride.
Pot. and Sodium Tartrate.
Manganese Sulphate.

Drastics.

Jalap. Gamboge.
Colocynth.
Elaterium.
Scammony.
Croton Oil.
Cathartic Acid, hypodermically.

Hydragogues.

Elaterium.
Gamboge.
Potassium Bitartrate.
Croton Oil.
Salines in large doses.

Cholagogues.

Podophyllin.
Mercurials.
Aloes. Rhubarb
Euonymin.
Iridin.

Cerebral Depressants lower or suspend the functions of the higher cerebrum after a preliminary stage of excitement. Under this head may be included the Hypnotics, Narcotics, General Anesthetics, and several of the Antispasmodics, all acting on the cells of the convolutions; at first stimulating the brain-functions, they produce after a time stupor, coma and insensibility.

The most useful of this class are the Bromides, Zinc Salts and Caffeine, as they also diminish reflex excitability and thus secure rest of the nervous system. Some of them are decidedly dangerous, as they may paralyze the heart or the medulla and its centres of organic life before the consciousness is much disturbed; such being Chloroform, Chloral, Phenol, Aconite, Opium, and the irritant poisons.

Cerebral Excitants are remedies which increase the functional activity of the brain, without producing any subsequent depression, or any suspension of the cerebral functions. They act partly by increasing the action of the heart and consequently the rapidity of the circulation, partly by a direct action upon the gray matter of the brain. The chief members of this group are—

Acetic Acid (inhaled).	Cannabis. Camphor.	Ether.
Alcohol (at first).	Coffee, Caffeine.	Quinine.
Ammonia (inhaled).	Tea, Theine.	Tobacco.
Ammoniac.	Guarana, Guaranine,	Strychnine.
Asafetida.	Coca, Cocaine.	Valerian.

The Cerebellum is markedly disturbed by the few drugs which affect it specifically, their action upon its different lobes producing various disturbances of coordination and equilibrium. *Alcohol* in considerable dose causes a staggering gait, and a tendency to fall; and different preparations thereof seem to affect different portions of the cerebellum. Intoxication by wine or beer is said to be accompanied by a tendency to fall sideways,—that, by whiskey, especially Irish whiskey, an inclination to fall on the face,—and that by cider a backward tendency; and these disturbances correspond exactly with those caused by injury to different lobes of the cerebellum (Brunton). *Apomorphine* in large doses seems to act upon the cerebellum or corpora quadrigemina, as the animal poisoned by it does not vomit, but moves round and round in a circle.

Ciliary Excitants are substances which, when dissolved in the mouth, promote the expectoration of bronchial mucus by their reflex excitation of the

tracheal and bronchial cilia. This group includes such agents as the Chlorides of Ammonium and Sodium, Potassium Chlorate and Gum Acacia.

Delirians excite the functions of the higher brain to such a degree as to disorder the mental faculties, producing intellectual confusion, loss of will-power, delirium and even convulsions. They are all narcotics (though all narcotics are not delirians), and the most important may be listed as follows:—

Belladonna.	Alcohol.	Cannabis Indica.
Stramonium.	Chloral.	Lupulus (at first).
Hyoscyamus.	Ether.	Opium (at first).
Turpentine.	Chloroform.	Nitrous Oxide Gas.

Demulcents (*demulceo*, I soothe),—are substances usually of oleaginous or mucilaginous nature, which soothe and protect the parts to which they are applied. This term is generally used for substances employed for mucous membranes, and the term *Emollients* for similar agents used on the skin. The chief agents belonging to this class are:—

Acacia.	Starch.	Honey.	Olive Oil.
Cetraria.	Glycerin.	Marsh-mallow.	Isinglass.
Barley.	Flaxseed.	White of Egg.	Tragacanth.
Licorice.	Gelatin.	Almond.	Bland Oils.

Dental Anodynes are substances employed locally in toothache due to caries exposing a nerve filament. Such are *Aconite*, *Opium* and *Cocaine salts*,—also Creosote, Chloral, Phenol, and Potassium Chlorate. A solution, containing the three first named, applied on a pledget of cotton, will promptly relieve whenever the nerve is accessible. *Chloral* should never be employed for this purpose, as in solution sufficiently strong to be of any service it is very apt to cause sloughing of the gum, especially if injected thereinto by a hypodermic syringe, as is frequently done by ignorant dentists, who advertise the "extraction of teeth without pain."

Dentifrices (*dens*, a tooth, *frico*, I rub),—are medicated powders or pastes applied with a stiff brush to cleanse the teeth and gums. *Chalk* is the basis generally used, for its mechanical action and its alkaline quality. Antiseptics, as *Borax*, *Quinine*, *Phenol*, etc., should also be employed, so as to prevent the acid fermentation of food products between the teeth and the consequent decay of the dentine. *Tincture of Myrrh* is an excellent ingredient, being an aromatic local stimulant and disinfectant.

Many drugs affect the teeth injuriously, such being the Mineral Acids, Persalts of Iron and Alum. The first two should be taken through a glass tube, and the mouth should be rinsed afterwards with a weak alkaline solution.

Deodorants are agents which destroy foul odors. The *Volatile Deodorants* are chiefly oxidizing and deoxidizing substances, acting chemically on the obnoxious gases; while the *Non-volatile* ones are mainly absorbents, which condense and decompose the effluvia. The deodorants in general use are the following-named:—

Formaldehyde.	Hydrogen Dioxide.	Charcoal.
Chlorine Gas.	Potassium Permanganate.	Earth. Lime.
Sulphurous Acid Gas.	Coffee, freshly roasted.	Ferrous Sulphate.

For removing the fetid exhalations emitted by the feces, the following powder is a very efficient and cheap deodorizing and disinfecting agent. Zinc Sulphate, lbs. ij, Sulphuric Acid, ℥jss to ℥ijss, Essence of Mirbane, ℥j, Indigo Blue, gr. ij. About a dessert-spoonful of this is placed in the bed-pan or chamber utensil before it is used. Contact with urine or a liquid stool causes its prompt solution, deodorization is instantaneous, the liquid excreta are at once sterilized, and the fetor is changed to a rather agreeable odor. *Oil of Eucalyptus* has the property of spreading rapidly over water in a thin film, and if a few drops are sprinkled over the water in the pan of a water closet before using the latter, no fecal odor will arise therefrom.

Destructive Metamorphosis of the tissues is promoted by a number of agents, most of which are classed as *Alteratives* or as *Astringents*, the most important of which are the following-named:—

Alkalies.	Sulphides and Iodides.
Vegetable Acids.	Sarsaparilla.
Metals and their salts.	Stillingia.
Colchicum.	Xanthoxylum.
Tannic and Gallic Acids, and substances containing them.	

Destructive Metamorphosis may be diminished by many substances, the following-named being the chief ones:—

Alcohol.	Salicin.	Resorcinol.
Glycerin.	Salicylates.	Chinolin.
Oils and Fats.	Quinine.	Cocaine

Diaphoretics and Sudorifics (*διαφορέω*, I carry through; *sudor*, sweat, *facio*, I make),—are remedies which increase the action of the skin and promote the secretion of sweat. When they act energetically, so that the perspiration stands in beads upon the surface, they are known as *Sudorifics*. They may be subdivided into the following groups, viz.—

- (1) *Simple Diaphoretics*, which enter the circulation and are eliminated by the sudoriferous glands, which they stimulate to increased action.
- (2) *Nauseating Diaphoretics*, which produce relaxation and the dilatation of the superficial capillaries.
- (3) *Refrigerant Diaphoretics*, which reduce the circulation, at the same time acting directly on the sweat-centres in the spinal cord and medulla.

The principal diaphoretics are the following-named, the figures referring to their respective supposed modes of action as indicated above;—

Aconite. ³	Ipecacuanha. ³	Mezereon. ¹
Veratrum. ³	Opium ^{2,3} (large doses).	Sarsaparilla. ¹
Tobacco. ^{2,3}	Dover's Powder. ²	Guaiacum. ¹
Lobelia. ^{2,3}	Tartar Emetic. ²	Serpentaria. ¹
Alcohol. ^{2,3}	Sulphur. ¹	Sassafras. ¹
Ether. ^{2,3}	Camphor. ¹	Senega. ¹
Nitrous Ether. ^{2,3}	Cocaine. ³	Vapor Bath. ²
Salicylates. ¹	Ammonium Acetate. ¹	Turkish Bath. ²
Pilocarpus. ^{1,3}	Ammonium Citrate. ¹	Wet Pack. ²
Pilocarpine. ^{1,3}	Potassium Salts. ³	Warm Drinks. ²

Diluents (*diluo*, I dilute),—are indifferent substances which, after their absorption, dilute the excretory fluids and enable the latter to hold more solid material in suspension. *Water* is the one true diluent, whatever form it may be disguised in, as teas, weak fluid foods, acid drinks, etc.

Discussants or Sorbefacients (*discutio*, I dissipate; *sorbere*, to suck),—are agents which promote absorption, and may be divided into two classes; (1) those which stimulate the lymphatics to the removal of morbid or inflammatory deposits, (2) those which promote the imbibition of nutritive or medicinal material into the system. [Compare ALTERATIVES.] These agents include the following-named:—

Arsenic.	Ichthyol.	Vapor Bath.
Mercury.	Lanolin.	Hot Water Bath.
Iodine.	Oleic Acid.	Poultices.
Iodides.	Cacao Butter.	Counterirritation.
Cadmium.	Massage.	Galvanism.

Lanolin and *Oleic Acid* have remarkable power of penetration through the skin and are used as excipients for drugs which are to be administered by cutaneous absorption. *Cacao Butter* possesses the same penetrative property, and is usually employed in making medicated suppositories.

Diuretics (*διούρησις*, urination),—are agents which promote the secretion of urine, either by raising the local or general blood-pressure and so increasing the renal circulation, by stimulating the secreting cells or nerves of the kidneys, or by flushing the kidneys with water. Diuretics may be classified according to their physiological action or according to the different purposes for which they are employed. *Refrigerant Diuretics*, especially the salines, excite the renal epithelium, induce a hyperemic condition of the kidneys and increase the water of the urine. They possess a sedative action upon the heart and the general circulation, but used to excess they depress the heart and impoverish the blood. Potassium Chlorate is a decided renal irritant, and should never be used as a diuretic. *Hydragogue Diuretics* increase the water of the urine largely, and in general act by raising arterial pressure, either—(a) throughout the body, or (b) locally in the kidneys. This they accomplish in various ways, direct and indirect,—increasing the action of the heart, contracting the efferent vessels or dilating the afferent vessels, so as to raise the blood-pressure in the glomeruli, etc. The action of the *Stimulant Diuretics* is directly upon the renal tissue, by which they are largely eliminated from the body. In small or moderate doses they dilate the renal arterioles, increase the renal blood-supply, and so induce diuresis, but in large doses they irritate the renal epithelium, contract the renal arterioles, diminish the renal blood-supply, excite renal inflammation, render the urine albuminous and bloody, and may even induce suppression of the urine. All the members of this division should be used with caution.

Individual members of the diuretic class act in various modes, some of them in more than one manner, and probably as follows, viz.—

1. By increasing the action of the heart (Alcohol, Digitalis, etc.) or by contracting the intestinal and other vessels, thus raising the general blood-pressure.
2. By dilating the afferent renal vessels, thereby increasing the renal blood-supply and raising the pressure in the glomeruli.
3. By contracting the efferent vessels, raising the pressure in the glomeruli and lessening absorption in the tubules, or both.
4. By stimulating the secreting cells or nerves of the kidneys.
5. By flushing the kidneys, as by the ingestion of Water in large quantity.

The following list contains the most important agents of this group, which are usually subdivided into the three classes indicated by the subtitles. The numbers refer to the probable modes of action of the drug in the above synopsis:—

<i>Refrigerant Diuretics.</i>	<i>Hydragogue Diuretics.</i>	<i>Stimulant Diuretics.</i>
Potassium Acetate. ⁴	Digitalis. ^{1,2}	Alcohol. ²
Potassium Bitartrate. ⁴	Strophanthus. ²	Blatta orientalis. ⁴
Potassium Citrate. ⁴	Convallaria. ¹	Cantharides. ⁴
Potassium Chlorate. ⁴	Cimicifuga. ^{1,2}	Turpentine. ⁴
Potassium Nitrate. ⁴	Adonis vernalis. ^{1,2}	Juniper. ⁴
Sodium Acetate. ⁴	Erythrophloeum. ¹	Savin. ⁴
Sodium Chlorate. ⁴	Squill. ^{1,2}	Copaiba. ⁴
Sodium Chloride. ⁴	Broom. ³ Sparteine. ³	Cubeb. ⁴
Ammonium Acetate. ⁴	Calomel. ⁴	Cannabis. ⁴
Calcium Chloride. ⁴	Caffeine. ^{1,4} Theocin. ⁴	Capsicum. ⁴
Lithium Carbonate. ⁴	Theobromine. ⁴ Agurin. ⁴	Buchu. ⁴
Lithium Citrate. ⁴	Apocynum. ^{1,2}	Asparagus. ⁴
Magnesium Citrate. ⁴	Nitrous Ether. ² Nitrites. ²	Guaiac. ⁴
Magnesium Sulphate. ⁴	Strychnine. ¹	Fennel. ⁴
Water ⁵ Milk. ⁵	Colchicum. ⁴	Urea. ⁴
Carbonic Acid.	Tobacco. ³	Uva Ursi. ⁴
Cold to surface. ¹	Sugar of Milk. ^{1,4}	Zea. ⁴

Diuretics are employed in medicine for certain definite purposes, as follows:—to remove fluid from the tissues and cavities of the body in cases of dropsy; to promote the elimination of waste-products and other poisons from the blood; to maintain the action of the kidneys; to dilute the urine, and to alter morbid conditions of that excretion.

In Dropsies from Cardiac Disease, or other dropsies due to venous congestion, the most efficient diuretics are those which act on the general vascular system, as Digitalis, Strophanthus, Squill, etc. Calomel is often very efficient in this form of dropsy, also Theobromine Sodio-Salicylate (Diuretin).

In Dropsy from Renal Disease, Diuretin, Broom-tops, Nitrous Ether, Oil of Juniper, Digitalis and Squill are the most reliable diuretics, in the order named.

In Ascites from Hepatic Cirrhosis, Copaiba is the best diuretic when the kidneys are healthy. In this form and the previous ones a little Pil. Hydrargyri given occasionally will often aid the diuretic action of the other agents.

To eliminate Waste-products from the Blood, Potassium Nitrate and Bitartrate, Turpentine, Juniper, Caffeine, and Water in large quantity. [Compare LITHONTRIPTICS.]

To Dilute the Urine, Water is the best agent, its most efficient form being Distilled Water charged with Carbonic Acid gas.

As Adjuvants to Diuretics, when pressure on the uriniferous tubules or venous congestion prevent their action,—paracentesis abdominis, purgation, cupping over the loins, and even venesection, are often necessary to start the diuretic action.

The activity of the renal cells is directly depressed by the *Renal Depressants*, which thereby lessen or suspend the secretion of urine. Morphine, Quinine and Ergot act in this manner through their influence on the circulation. Instead of acting as a diuretic Digitalis may stop the secretion of urine, by so stimulating the vaso-motor centre as to greatly contract the renal vessels, and arrest the renal circulation (Brunton). This it might do if a preparation were used which was deficient in Digitoxin or Digitalein, the dilators of the renal arteries: (see under DIGITALIS.) The same is true of Caffeine and Strychnine, hence it is well to combine these with other diuretics which dilate the renal

vessels, as the Nitrites, (Nitrous Ether, etc.), and Alcohol. Digitalis contains in itself the power of doing both these actions, and hence it is the ideal diuretic.

Emetics (ἐμέω, I vomit),—are agents which produce vomiting. They may be subdivided into two groups, *Local Emetics*, or those which act by irritating the end-organs of the gastric, pharyngeal or esophageal nerves, and *General or Systemic Emetics*, which act through the medium of the circulation. The members of both these groups produce emetic action by irritation of the vomiting centre in the medulla, the first by reflex, the second by direct stimulation. The principal emetics are the following named:—

<i>Local Emetics.</i>	<i>General Emetics.</i>
Alum, Mustard, Salt.	Ipecacuanha. Emetine.
Ammonium Carbonate.	Apomorphine.
Zinc and Copper Sulphates.	Tartar Emetic
Subsulphate of Mercury.	Veratrine.
Tepid Water, in quantity.	Senega.
Vegetable Bitters, as Quassia,	Squill.
in strong infusions.	Ouabain.

Tartar Emetic, *Ipecacuanha* and probably *Apomorphine*, act locally as well as systemically, for if injected subcutaneously they are excreted by the stomach in part, thus irritating the gastric nerves as well as the vomiting centre. *Pilocarpus* is a local emetic, and *Digitalis* and its congeners, also *Muscarine*, are systemic emetics, but none of these agents are used medicinally for that purpose. *Opium*, *Morphine*, and *Codeine* usually produce emesis as one of their after effects.

Vomiting is an evacuant act which consists in compression of the stomach by the simultaneous spasmodic contraction of the diaphragm and abdominal muscles; also in relaxation of its cardiac orifice by contraction of the radiating muscular fibres in the gastric wall. If both acts occur at the same time, the contents of the stomach are expelled and vomiting occurs; if, however, the two acts do not take place simultaneously, the contents of the stomach are retained, and the abortive efforts are called *retching*. These acts are controlled and regulated by a nerve-centre in the medulla oblongata, which is closely connected with the respiratory centre, the muscular movements of vomiting being merely modified respiratory movements. This vomiting centre is ordinarily excited in two ways,—(1) by the peripheral stimulation of afferent nerves going to it from other parts of the body, (2) by impulses sent down to it from the brain (Brunton).

Nausea and vomiting are diminished by agents termed *Anti-emetics*, including gastric sedatives and general sedatives; some of which act by means of a local sedative influence upon the end-organs of the gastric nerves, others by reducing the irritability of the vomiting centre in the medulla. The act of vomiting being occasioned by irritation of afferent nerves from many regions of the body or impulses from the brain excited by impressions on the nerves of special sense, the measures and agents by which it may be combated are very diversified. [Compare the article entitled VOMITING, in Part III.] The most important anti-emetics are named in the following lists:—

<i>Local Gastric Sedatives.</i>	<i>General Sedatives.</i>
Alcohol.	Creosote.
Alum.	Ether.
Arsenic.	Ice.
Belladonna.	Opium.
Bismuth.	Hydrocyanic Acid.
Carbonic Acid.	Silver Nitrate.
Cerium Oxalate.	Calomel } small
Chloroform.	Ipecac } doses.
Phenol.	Hot water.
Potassium Nitrate.	Cocaine.
	Opium.
	Morphine.
	Codeine.
	Hydrocyanic Acid.
	Bromides.
	Chloral.
	Nitro-glycerin.
	Alcohol.
	Amyl Nitrite.
	Food.

Ice, swallowed in small pieces, is probably the most efficient of the local sedatives. *Phenol* and *Cocaine* are also effective anti-emetics, given in small doses by the mouth at short intervals. *Astringents* are very useful where there is congestion of the gastric mucous membrane, as in the vomiting of alcoholism and phthisis, when *Silver Nitrate* and *Alum* are especially to be recommended. *Opium* and its principal alkaloid, *Morphine*, will produce nausea and vomiting in many persons, even when given in very small doses.

Emmenagogues (ἐμμηρία, the menses, ἄγω, I move),—are remedies which restore the menstrual function, either directly by stimulation of the uterine muscular fibre, or indirectly by improving the blood and toning up the nervous system. Some of the direct emmenagogues are *oxytocic* in large doses. The principal members of this class are named in the following list:—

<i>Direct Emmenagogues.</i>	<i>Indirect Emmenagogues.</i>
Ergot.	Apiol.
Savin.	Borax. Myrrh.
Tansy. Rue.	Guaiacum.
Digitalis.	Polygonum Hydropip.
Cantharis.	Potass. Permanganate.
Pulsatilla.	Manganese Dioxide.
Asafetida.	Cimicifuga.
Alcohol.	Oxalic Acid.
Indigo.	Hedeoma.
Hydrargyrum Binioidide.	Origanum.
Caulophyllum.	Viscum Flavescens.
	Iron.
	Manganese.
	Cinnamon.
	Quinine.
	Strychnine.
	Aloetic Purgatives.
	Cod-liver Oil.
	Hot Hip-baths.
	Leeching the genitals.
	Rubefacients to thighs.
	Tonic Remedies.

Emollients (*emollio*, I soften),—are substances which soften and relax the tissues to which they are applied. They relieve tension, dilate vessels, diminish pressure on the nerves, and protect inflamed surfaces from the air and from friction. The principal articles which may be classed under this heading are the following:—

Hot Fomentations.	Linseed Oil.	Petrolatum.
Poultices.	Olive Oil.	Soap Liniment.
Glycerin.	Spermaceti.	Starch.
Lard.	Almond Oil.	Cacao Butter.

Errhines and Sternutatories (ἐν, in, ῥῶν, the nose; *sternuto*, I sneeze),—are agents which produce increased nasal secretion and sneezing, when locally applied to the mucous membrane of the nose. The first term is usually applied to substances which cause increase of the mucus without sneezing, the latter to those which invariably produce sneezing. The drugs should be applied in powder. The stimulus produced by these agents is transmitted by the nasal branches of the fifth nerve to the respiratory centre, exciting the sudden and forcible expiratory effort called sneezing; also to the vaso-motor centre, contracting the smaller vessels throughout the body and producing a general rise in the blood-pressure. The principal agents of this class are—

Tobacco, as snuff.	Euphorbium.	Capsicum.
Ipecacuanha.	Sassy Bark.	Hellebore.
Sanguinaria.	Saponin.	Ammonia.
Veratrum Album.	Ginger.	Cubebs.

The last two named may be used as simple Errhines, as the vapor of dilute Ammonia-water or the smoke of burning Cubebs do not excite sneezing generally.

Escharotics or Caustics (*εσχάρω*, a slough or scab; *καίω*, I burn),—are agents which destroy a tissue to which they are applied, and produce a slough. They may be divided into two classes, the *actual*, or those in which heat is the active agent, and the *potential*, by which a chemical process is called into play. Escharotics act usually in one of the following modes:—

1. By abstracting the water of the tissues.
2. By combining with the albumin of the tissues.
3. By corrosive deoxidation of the tissues.
4. By conversion of the tissues into carbon or gaseous bodies.

The principal escharotics are named in the following list, the numbers pointing out the mode of action as stated above:—

Mineral Acids. ¹	Caustic Potash. ¹	Mercuric Chloride. ²
Glacial Acetic Acid. ¹	Caustic Soda. ¹	Mercuric Oxide. ²
Phenol. ¹	Dried Alum. ²	Mercuric Nitrate. ²
Chromic Trioxide. ³	Silver Nitrate. ²	Bromine. ³
Arsenic Trioxide. ¹	Copper Sulphate. ²	High Heat. { Cautery. ⁴ Moxa. ⁴ Boiling Water. ⁴
Antimony Chloride. ¹	Zinc Sulphate. ²	
Lime. ¹	Zinc Chloride. ²	

Nitric Acid and *Zinc Chloride* are probably the safest and most generally useful of the potential caustics where any decided escharotic action is desired. *Silver Nitrate* is the best for superficial use, its action being limited to the part with which it comes in contact, and being stopped at once by the application of a solution of common salt. *Chromic Trioxide* is one of the most efficient escharotics, but it must be carefully used.

Expectorants (*ex*, out of, *pectus*, the breast),—are remedies which modify the secretion of the broncho-pulmonary mucous membrane, and promote its expulsion. They may be divided into the following groups:

Nauseating Expectorants in large doses act mechanically by expelling the mucus in the act of vomiting, in small doses by increasing osmosis from the inflamed mucous membrane. The members of this subdivision generally increase secretion and tend to lower the blood-pressure. The chief ones are the following named:—

Antimony, Tartar Emetic.	Apomorphine.	Potassium Iodide
Ipecacuanha, Emetine.	Quebracho.	Lobelia.
Pilocarpus (Jaborandi).	Alkalies.	Lobeline.

Stimulant Expectorants are largely eliminated by the bronchial mucous membrane, which they stimulate, altering the secretion and facilitating expectoration. These remedies generally diminish secretion and increase blood-pressure. This subdivision includes the following named:—

Ammonium Chloride.	Acids.	Nux Vomica.
Ammonium Carbonate.	Squill.	Strychnine.
Benzoin and Benzoic Acid.	Garlic.	Senega.
Balsams of Peru and Tolu.	Onion.	Saponin.
Wood Tar, and Tar.	Turpentine.	Licorice.
Oleum Pini Sylvestris.	Sulphur.	Saccharine Substances.

Besides the above many other remedies may act as expectorants, some by relieving bronchial spasm, as Opium, Stramonium, and Tobacco; others by soothing the irritable respiratory centre, as Opium and Chloral; and the ciliary excitants by reflex action through their impression on the nerves of the mouth.

Galactagogues (*γάλα*, milk, *ἄγω*, I bring away),—are agents which are supposed to increase the lacteal secretion. The value of most of them is very doubtful, probably the only efficient one being *Pilocarpus* (Jaborandi), but its influence is very transient and the excessive perspiration and salivation caused by it are objectionable. The leaves of *Ricinus communis*, the castor-oil plant, locally applied, have been highly recommended; but general measures are more trustworthy, such as the correction of anemia, attention to sore nipples, administration of tonics and good food. [Compare the article entitled LACTATION in Part III.] Other agents reputed to have galactagogue properties are the following-named:—

Anise.	Gallega.	Beer, Ale, Porter.
Dill.	Physostigma.	Black Tea.
Fennel.	Strychnine.	Sinapisms.
Vanilla.	Potassium Chlorate.	Electricity.

Galactophyga (*α*, milk, *φέγω*, I shun),—are agents and measures which diminish or arrest the secretion of milk. *Belladonna* or its alkaloid *Atropine* is the most efficient, acting whether applied locally or administered internally. *Antipyrine* has similar power, so also has Camphor applied locally and Potassium Iodide, Colchicum with Magnesium Sulphate, Tobacco, Sage, Quinine, Tannin, etc. Compression of the breasts, by bandaging or strapping with adhesive plaster, has positive antigalactic action.

Hearing is affected by several drugs. *Strychnine* and *Morphine* increase the excitability of either the auditory nerve or the centre for hearing in the superior temporo-sphenoidal convolution, making that faculty much more acute. *Quinine*, *Antipyrine* and the *Salicylates* produce hyperemia of the auditory apparatus, causing subjective noises, as humming, buzzing, or ringing, which are very unpleasant. Hydrobromic Acid and the Bromides, also Ergot, will diminish the congestion and thus neutralize or prevent these noises to a great extent.

Quinine in large doses is believed by some to have produced permanent injury of the sight and the hearing, but authentic cases of such action are extremely rare, if indeed they can be found at all. Temporary deafness is often caused by Quinine, but it usually disappears soon after the administration of the drug is stopped.

Hepatic Depressants lower the functional activity of the liver, some reducing the secretion of bile, others lessening the production of glycogen, and others diminishing the production of urea. *Lead Acetate* is a direct hepatic depressant, especially in large doses, and is probably the only drug which lessens the biliary secretion without causing purgation. Many *Purgatives* diminish the secretion of bile by lowering the blood-pressure in the liver and by carrying off material from which bile may be formed. Contrary to the general opinion *Opium* and *Morphine* do not affect the biliary secretion (Murrell). The list of hepatic depressants includes the following-named agents:—

<i>Lessening Bile.</i>	<i>Diminishing Glycogen.</i>	<i>Lessening Urea.</i>
Lead Acetate.	Opium.	Opium.
Atropine.	Morphine.	Morphine.
Calomel. Chloral.	Codeine.	Codeine.
Castor Oil.	Arsenic.	Alcohol.
Gamboge.	Antimony.	Colchicum.
Magnesium Sulphate.	Phosphorus.	Quinine.

Hepatic Stimulants and Cholagogues (*χολή*, bile, *ἄγω*, I bring away),—are two groups of agents acting upon the biliary secretion, the first-named increasing the functional activity of the liver-cells and the amount of bile formed, the second removing the bile from the duodenum and preventing its reabsorption into the portal circulation. Some hepatic stimulants are also cholagogues, others are not, while cholagogues proper generally act indirectly as hepatic stimulants by carrying off the bile and thereby urging the liver to secrete more. The discovery of the enterohepatic circulation of bile has cleared up many of the discrepancies formerly existing with regard to the action of drugs upon this gland and its secretion, yet neither this subject nor hepatic chemistry has yet attained such results as would enable us to formulate positive doctrines thereon. *Bile*, *Bile Salts* and *Sodium Salicylate* are at present the only agents which have been experimentally proven to have the direct power of increasing the biliary secretion, though a number of drugs are believed to act in this manner upon clinical and other evidence. The following list includes the principal agents which are generally credited with the actions defined above:—

<i>Hepatic Stimulants.</i>		<i>Cholagogues.</i>
Bile, Bile Salts.	Ipecacuanha.	Mercury with Chalk.
Sodium Salicylate.	Colocynth.	Calomel.
Nitro-hydrochloric Acid.	Colchicum.	Pil. Hydrargyri.
Mercuric Chloride.	Podophyllin.	Sodium Phosphate.
Mineral Acids. Arsenic.	Euonymin.	Sodium Sulphate.
Sulphurated Antimony.	Iridin. Jalapin.	Potassium Sulphate.
Benzoic Acid.	Scammony.	Aloes. Rhubarb.
Sodium Benzoate.	Rhubarb.	Podophyllin.
Sodium Phosphate.	Aloes.	Colchicum.
Sodium Sulphate.	Sanguinarine.	Colocynth.
Sodium Phenolsulphonate.	Hydrastin.	Jalapin.

To secure the best cholagogue effect it is advisable to combine an hepatic stimulant with an intestinal stimulant which shall produce increased secretion from the intestinal mucous membrane and excite peristalsis. *Hydrochloric Acid* which has been kept long and has become a light or golden-yellow color, is relatively inert as an hepatic stimulant, but the freshly combined, deep red acid is active and valuable (Wood).

The glycogenic function of the liver, and the production of urea are stimulated by the following-named drugs:—

<i>Increasing Glycogen.</i>	<i>Increasing Urea.</i>
Amyl Nitrite.	Arsenic. Iron.
Sodium Bicarbonate.	Antimony. Phosphorus.
Nitro-hydrochloric Acid.	Ammonium Chloride.

Hypnotics (*ὑπνος*, sleep),—are remedies which produce sleep. In this wide sense the term includes the narcotics and the general anesthetics, but it is usually restricted to those agents which, in the doses necessary to cause sleep, do not disturb the normal relationship of the mental faculties to the external world (Brunton). Another definition of hypnotics is—that they produce sleep with-

out suspending the consciousness of pain, narcotics doing both. Hypnotics may be subdivided into the following classes:—

Pure Hypnotics,—which directly induce a sleep closely resembling the normal, without causing narcotic or other dangerous cerebral symptoms. The *Bromides* are the type of this subdivision, but the list is constantly growing smaller as experience reveals toxic powers in the action of its members.

Narco-hypnotics,—which induce sleep by direct depression of the cerebral functions and in larger doses are narcotic, suspending the consciousness of pain and producing coma. *Opium* is the type of this class.

Indirect Hypnotics,—which induce sleep by removing or suppressing any cause (not mental) which interferes therewith. Such are the non-narcotic analgesics,* acting against pain; the respiratory stimulants,† relieving dyspnea; the pulmonary sedatives,‡ relieving cough; the motor depressants,§ restraining excessive motor activity; also the vascular and cardiac tonics,¶ antagonizing cerebral hyperemia and regulating the cardiac action.

The principal members of each of the above subdivisions are named in the following lists:—

<i>Pure Hypnotics.</i>	<i>Narco-hypnotics.</i>	<i>Indirect Hypnotics.</i>
Potassium Bromide.	Hydrated Chloral. Chloretone.	* Antipyrine.
Sodium Bromide.	Opium, Morphine, Narceine.	* Acetanilide.
Paraldehyde.	Hycosine. Duboisine.	* Acetphenetidin.
Sulphonmethane.	Cannabis Indica.	† Strychnine.
Sulphonethylmethane.	Pellotine.	‡ Hydrocyanic Acid.
Veronal.	Passiflora Incarnata.	§ Conium.
Ethyl Carbamate.	Piscidia Erythrina.	§ Gelsemium.
Chloralformamide.	Amylene Hydrate.	¶ Ergot.
Hedonal.	Alcohol.	¶ Digitalis.

Hydrated Chloral is undoubtedly the most efficient of all hypnotics. *Paraldehyde* is one of the most reliable and safe, but its sleep is transient, lasting only a few hours. *Sulphonmethane* and *Sulphonethylmethane* are very efficient in some cases, but often fail entirely. *Ethyl Carbamate* is feeble and uncertain, and the same may be said of *Humulus* and some other agents which are not mentioned above. *Piscidia* is also somewhat uncertain in action, though its hypnotic and anodyne powers have proved very decided in many cases.

Dr. Wilcox rejects the dangerous, unreliable and objectionable hypnotics, and retains four as amply sufficient for all ordinary cases of insomnia. These he classifies as follows:

As to Potency: Paraldehyde, Chloralformamide, Pellotine, Sulphonethylmethane.

As to Rapidity: Pellotine, Paraldehyde, Chloralformamide, Sulphonethylmethane.

As to not causing Habituation: Pellotine, Sulphonethylmethane, Chloralformamide, Paraldehyde.

As to Safety: Chloralformamide, Pellotine, Paraldehyde, Sulphonethylmethane.

Intestinal Astringents contract the walls of the intestinal vessels, diminishing the exudation therefrom, and lessening the fluidity of the fecal discharges. The more powerful members of this group have also a constringing action on the intestinal mucous membrane. The principal agents of this class are named in the following lists:—

<i>Astringents.</i>		<i>Constringents.</i>
Phosphoric Acid.	} Diluted.	Tannic Acid.
Nitric Acid.		Vegetable Astringents.
Sulphuric Acid.		Alum.
Acetic Acid.		Zinc Oxide.
Lead Acetate.		Copper Sulphate.
Silver Nitrate.		Persalts of Iron.

Irritants are substances which, when applied to the skin, produce a greater or less degree of vascular excitement. When used to produce a reflex influence on a part remote from their site, they are termed counter-irritants. They may be subdivided into the following groups:—

Rubefacients, are those which produce temporary redness and congestion of the skin, unless left too long in contact with the surface, when they may cause exudation between the cuticle and the true skin (vesicants), or may destroy the tissue and form a slough (escharotics). They may also induce muscular atrophy.

Vesicants, Epispastics or Blisters, are those which cause decided inflammation of the skin and the outpouring of serum between the epidermis and the derma. *Cantharides* is the agent generally used for blistering purposes.

Pustulants, affecting isolated parts of the skin, namely—the orifices of the sweat-glands, giving rise to pustules.

The following list includes the principal agents and measures belonging to these three groups:—

<i>Rubefacients.</i>	<i>Rubefacients.</i>	<i>Vesicants.</i>
Mustard.	Oil of Cajuput.	Cantharides.
Capsicum.	Oil of Turpentine.	Euphorbium.
Camphor.	Volatile Oils.	Mezereon.
Ammonia.	Pitch. Friction.	Iodine.
Mezereon.	Hot Water.	Rhus Toxicodendron.
Arnica.		Ammonia (the confined vapor).
Alcohol.	<i>Pustulants.</i>	Glacial Acetic Acid.
Ether.	Croton Oil.	Volatile Oil of Mustard.
Chloroform.	Tartar Emetic.	Heat. { Boiling Water.
Iodine.	Ipecacuanha.	{ Corrigan's Hammer.
Menthol.	Silver Nitrate.	

Lithontriptics and Antilithics (*λίθος*, a stone, *τρίβω*, I wear down),—are agents which are supposed to promote the solution of concretions in the excretory passages (lithontriptics) or to prevent their formation (antilithics). These terms are generally restricted to remedies affecting the urinary calculi, but those directed against the biliary form are included in this arrangement for the sake of consistent classification. The chief agents coming under these titles are the following-named:—

<i>Biliary Calculi.</i>	<i>Uric Acid Calculi.</i>
Ether and Turpentine. (Durande's Solvent.)	Distilled Water.
Sodium Bicarbonate.	Potassium Salts.
Sodium Salicylate.	Lithium Salts.
Sodium Phosphate.	Magnesium Citroborate.
Castile Soap.	Piperazin.
Alkaline Waters, especially Vichy.	Lysidin.
	Lycetol.
<i>Calcium Oxalate Calculi.</i>	<i>Phosphatic Calculi.</i>
Dilute Nitro-hydrochloric Acid.	Ammonium Benzoate.
Carbonated Water	Benzoic Acid.
Lactic Acid (for digestion).	Dilute Nitric Acid.

There is probably little or no solvent value to the agents recommended for biliary calculi. In the case of uric acid calculi the administration of *Potassium* or *Lithium Salts* is based on their power of combining with the acid in the calculus, thus forming urate of potas-

sium or of lithium, which salts are more soluble than uric acid itself. *Piperazin* is still more efficient in this respect, forming a piperazin urate which is seven times more soluble than lithium urate. *Lysidin* is still more powerful.

Motor-Depressants lower the functional activity of the spinal cord and other parts of the motor apparatus and in large doses paralyze them. Drugs which depress the cerebral motor convolutions, the motor centres in the medulla, the motor nerve-trunks and nerve-endings, or the muscular contractility itself, produce impairment of the motor power, and in large doses may cause complete paralysis of the part or parts involved. Some act indirectly by reducing the spinal circulation, as Aconite, Digitalis and large doses of Quinine, others by a direct paralyzant action on the centres. The principal members of this class are named in the following list:—

Curare.	Aconite.	Chloral.
Physostigma.	Veratrum.	Bromides.
Conium.	Tobacco.	Potassium Salts.
Gelsemium.	Lobelia.	Many metallic Salts.
Opium, Morphine,	Digitalis.	Amyl Nitrite.
Apomorphine.	Arnica.	Nitroglycerin.
Belladonna, Atropine.	Ailanthus.	Hydrocyanic Acid.
Stramonium.	Saponin.	Potassium Cyanide.
Hyoscyamus.	Sparteine.	Methyl-strychnine.
Muscarine.	Ergot (at last).	Many Methyl compounds.
Pulsatilla.	Quinine (large doses).	Ammonium Cyanide.
Grindelia.	Camphor.	Ammonium Iodide.
Phytolacca.	Alcohol (large doses).	Many compound Ammonias.
Pilocarpus.	Ether (large doses).	Galvanism.
Quebracho.	Chloroform (large).	Cold.

The motor centres in the medulla are powerfully depressed by Opium, Morphine, Aconite, Conium, Chloral, Physostigma, and large doses of Alcohol, Ether and Chloroform. These last three are also paralyzers of the motor convolutions in the brain, arresting all voluntary movements when administered in sufficient quantity. The anterior cornua of the cord are greatly depressed by Physostigma, Phenol, and other agents, and the motor nerves by Conium, Methyl-strychnine, etc., both actions resulting in paralysis of the limbs. Curare, even in small doses, paralyzes the end-organs of the motor nerves, and Belladonna, the compound Ammonias, Methyl compounds, etc., exercise a similar but less powerful influence. Galvanism is an effective local depressant of motor activity.

Motor-Excitants are agents which increase the functional activity of the spinal cord and the motor apparatus, producing disturbances of motility, heightened reflex excitability, and tetanic convulsions when given in large doses, their ultimate effect being motor paralysis from over-stimulation. The most important motor-excitants are those named in the following list:—

Nux Vomica.	Alcohol (small dose).	Ergot.	Digitalis.
Ignatia.	Ether (small dose).	Ustilago.	Convallaria.
Strychnine.	Chloroform (small dose).	Gossypium.	Cimicifuga.
Brucine.	Ammonia.	Picrotoxin.	Pilocarpine.
Thebaine.	Absinthe.	Aconitine.	Pyridine.
Morphine (large dose).	Buxine.	Nicotine.	Rhus Toxicod.
Atropine (large dose).	Calabarine.	Camphor.	Electricity.
Cocaine.			

The principal members of this class are Nux Vomica and Ignatia, with their alkaloids Strychnine and Brucine, also Thebaine, the tetanizing alkaloid of Opium. The group also includes Morphine and Atropine, which, though at first sedative, when given in large doses produce convulsions. The respiratory centre in the medulla is stimulated by Strychnine,