Gruber; Stamm; Bucquoy; A. Gubler; Nicaise; E. Meyer; Murchison; Paleari; Panthiel.

Second Annual Report of the State Board of Health of Massachusetts, 1871, p. 21.

Tardieu, Ambroise. *Dictionnaire d'Hygiène publique et de Salubrité*, deux. édition, tome troisième, p. 334.

Zincum.—Zinc. *Zinc*, Fr. ; *Zink*, Ger.

Zinci Oxidum.—Oxide of zinc. A yellowish-white powder, insoluble in water, but soluble in dilute sulphuric and muriatic acids without effervescence. The solutions, when neutral, yield white precipitates with ferrocyanide of potassium and hydrosulphate of ammonium. Dose, gr. ss—grs. v.

Zinci Carbonas Precipitatus.—Precipitated carbonate of zinc. A light, white powder, odorless and tasteless, and insoluble in water or alcohol.

Ceratum Zinci Carbonatis.—Cerate of carbonate of zinc. (Not official.) (Carbonate, ℥ ij ; ointment, ℥ x.)

Zinci Sulphas.—Sulphate of zinc. In colorless crystals, which effloresce on exposure to air. It is soluble in water, and the solution affords white precipitates with ammonia, chloride of barium, ferrocyanide of potassium, and hydrosulphate of ammonium. The precipitate thrown down by ammonia is wholly soluble in an excess of the alkali. Dose, gr. ¼—grs. vj.

Zinci Acetas.—Acetate of zinc. In micaceous crystals, which effloresce in a dry atmosphere. It is soluble in 3 parts of water, and its solution yields white precipitates with ferrocyanide of potassium and hydrosulphate of ammonium. The salt is decomposed by sulphuric acid, with the escape of acetous vapors. Dose. gr. ss—grs. ij.

Liquor Zinci Chloridi.—Solution of chloride of zinc. An aqueous solution, containing about 50 per cent of the salt.

Zinci Chloridum.—Chloride of zinc. A white deliquescent salt, wholly soluble in water, alcohol, and ether. Its aqueous solution yields with nitrate of silver a white precipitate, insoluble in nitric acid. (These preparations are for external use only.)

Zinci Valerianas.—Valerianate of zinc. A white anhydrous salt, in the form of pearly scales, having a faint odor of valerianic acid, and a metallic styptic taste. It dissolves in one hundred parts of water, and in forty of alcohol of the specific gravity of 0·833. Dose, gr. ¼—gr. j.

Unguentum Zinci Oxidi.—Ointment of oxide of zinc. (Oxide of zinc, 20 parts ; benzoinated lard, 80 parts.)

Antagonists and Incompatibles.—Lime-water, the alkalies and their carbonates, nitrate of silver, and the vegetable astringents, are incompatible with zinc-salts. The acetate of lead is also incompatible, but a solution containing sulphate of zinc and acetate of lead, notwithstanding the double decomposition which ensues, is an effective

injection in gonorrhœa. With valerianate of zinc, acids, many of the metallic salts, soluble carbonates, and vegetable astringents, are incompatible. The antidotes to be used in cases of poisoning by the zinc-salts are lime-water, mucilaginous drinks, milk, tannic acid, the carbonated alkalies, common soap, etc.

Synergists.—The mercurial, silver, antimonial, and copper preparations favor the action of the zinc-salts.

Physiological Actions.—The preparations of zinc are active in proportion to their solubility and power of diffusion. The chloride, the sulphate, and the acetate, are the most active, and in the order in which they are placed ; the carbonate and the oxide being insoluble, have very feeble diffusive power, and possess consequently very slight activity. The chloride is a very active escharotic. Applied to the denuded integument, it sets up decided inflammation, and produces an intense burning pain, followed by sloughing. Owing to its great affinity for water and power of combination with albumen, it penetrates deeply and widely, and the eschar which it produces is thick, hard, and white. The dried sulphate of zinc (deprived of its water of crystallization by heat) is also feebly escharotic when applied to an open wound. Solutions of the sulphate and acetate act locally as *astringents* by combining with albumen.

The soluble salts of zinc have a styptic metallic taste, which is very disagreeable. The sulphate of zinc is a very prompt and efficient emetic, acting without much preliminary nausea, and without much constitutional depression. It is a *specific emetic ;* it acts to produce emesis when injected into the veins. Long-continued use of the sulphate, even in small medicinal doses, may excite ulceration of the mucous membrane. The oxide and carbonate, although insoluble and inactive, slowly produce systemic effects. The chloride is a powerful irritant poison, causing heat and a sense of constriction of the throat, a strong metallic taste, burning at the stomach, nausea, vomiting, great depression of the pulse, coldness of the surface, cold sweat, cramps of the legs, etc. The mind is unaffected. In a few instances nervous symptoms have followed, besides the cramps, and in one notable case there was loss of the senses of taste and smell.

All of the salts of zinc, when long continued, may produce a train of symptoms not unlike those caused by lead, viz., emaciation, pallor, loss of strength, constipation and colic, muscular weakness and trembling, paralysis, etc. The oxide in large doses, and used for a long period, has produced wasting, a fetid breath, gastro-intestinal catarrh, weakness, and feeble mind.

The zinc-salts most probably exist in the blood in the form of albuminate, and in close relation to the red blood-globules. They manifest much less tendency to accumulate, and are excreted much more rapidly than mercury, lead, and copper. They diffuse out of the blood

chiefly by the liver and intestinal glandular apparatus, and are found in great quantity in the fæces. To a slight extent they are also excreted by the kidneys.

THERAPY.—The sulphate of zinc is much employed as an *emetic* in cases such as *narcotic poisoning*, where prompt and efficient action is necessary. Six grains will generally prove sufficient. It may be repeated every fifteen minutes, well diluted with water, until emesis occurs. It was formerly much employed as an *emetic* in *croup*, but now tartar-emetic, but especially the subsulphate of mercury, is preferred.

The oxide of zinc is an excellent remedy for *gastralgia*. It is indicated also in the following state of things: *pain after taking food, nausea, intestinal pain, succeeded by prompt alvine discharges*, the fæces being made up largely of undigested food. From five to ten grains mixed with aromatic powder and combined with morphine, if need be, may be given before each meal. In the *summer diarrhœa of children*, it is a very efficient remedy. It may be administered with bismuth and pepsin. ℞ Bismuthi subnitrat., ʒj—ʒij; pepsinæ sacch. (Sheffer's), ʒss; zinci oxidi, grs. vj—grs. xij. M. Ft. pulv. no. xii. Sig.: *One powder every four to six hours.* In the *chronic diarrhœa* both of children and adults the oxide of zinc (from two to ten grains) is serviceable under the same circumstances in which bismuth is presumed to be indicated, but it is a less pleasant remedy in action than the latter. The sulphate (gr. ss—grs. ij) often gives great relief in that form of *dyspepsia* which is the cause of *oxaluria*. In small doses, the sulphate, like most of the mineral remedies of this group, increases for a time the appetite and digestive capacity, but this effect is soon succeeded by gastro-intestinal catarrh, nausea, and loss of appetite. The sulphate, as well as the oxide, is an astringent; it arrests the peristaltic movements and causes constipation, and is therefore an appropriate remedy in *chronic diarrhœa* and *chronic dysentery*. In its action and results it is similar to but less efficient than sulphate of copper. It may be combined with opium and ipecacuanha: ℞ Zinci sulphat., pulv. opii, pulv. ipecac., āā grs. xij. M. Ft. pil. no. xij. Sig.: One pill three or four times a day.

The zinc preparations possess undoubted efficacy in certain disorders of the thoracic organs. The *night-sweats of phthisis* are often prevented by a pill of oxide of zinc and extract of belladonna (three grains of the former and half a grain of the latter) given at bedtime. The zinc is serviceable without the belladonna, but the combined action is more efficient. The sulphate of zinc, by virtue of its astringency, has been prescribed in *bronchorrhœa*, but other agents are now preferred. The oxide of zinc is a serviceable *prophylactic* against the recurrence of the attacks of *spasmodic asthma*. It is also one of the numerous remedies which has been used with a varying degree of success in *whooping-cough:* ℞ Zinci oxidi, ʒj; ext. belladonnæ, grs. v.

M. Ft. pil. no. xx. Sig.: *One pill three times a day* as a prophylactic for asthma, and as a remedy for whooping-cough. The sulphate of zinc (gr. ¼—gr. j) and extract of belladonna (gr. ⅛—gr. ss) may be used in combination for the relief of the same cases. It is highly probable that the sulphate of zinc, being more soluble, is much more efficient in the treatment of these neuroses of the digestive organs than the oxide.

The preparations of zinc exert an influence upon the nervous system which has been and is called *antispasmodic*. In certain disorders of the nervous system, of which the chief manifestations are *spasm* and *convulsion* (clonic), they are sometimes very serviceable. Much has been said for and against the oxide of zinc as a remedy for *epilepsy*. A few cases are improved by it; in the great majority it fails utterly. The author expresses with diffidence his conviction that this remedy is most useful in those cases in which the peripheric irritation has its origin in the stomach; it acts by allaying irritability of the terminal filaments of the pneumogastric, and probably also by removing a diseased state of the gastric mucous membrane. *Epileptiform vertigo* and *epileptiform angina pectoris*, when they arise (as they not unfrequently do) from gastric disorder of some kind, are sometimes cured by the oxide of zinc. The so-called *nervous headache* of hysterical women, *nervous cough*, and *aphonia*, due to uterine and ovarian irritation, are often relieved by the valerianate of zinc. Sulphate of zinc is one of the numerous remedies for *chorea*, acting in a manner similar to arsenic, but inferior to this agent in curative power. In *neuralgia* due to reflex irritation from the female pelvic organs, the preparations of zinc, notably the valerianate, are often extremely beneficial. ℞ Zinci valerianat., ℈j; ext. gentianæ, ℈j; ext. nucis vom., grs. v. M. Ft. pil. no. xx. Sig.: *One pill three or four times a day.* In *chronic alcoholismus*, to relieve the trembling, to diminish the appetite for strong drink, and to relieve the gastric catarrh, the oxide of zinc is very useful: ℞ Zinci oxidi, ʒj; piperin., ℈j. M. Ft. pil. no. xx. Sig.: *One pill three or four times a day.*

EXTERNAL USES.—The author has personal knowledge of several cases of *caries* cured by the injection of *Villate's solution*. The following is the composition of this fluid: Sulphate of copper, sulphate of zinc, of each 15 parts; solution of subacetate of lead, 30 parts; vinegar, 200 parts. The sinus or sinuses leading to the carious bone should be thoroughly injected with the solution. It need hardly be remarked that this treatment would not remove a sequestrum.

An excellent caustic for the destruction of *lupus*, *epithelioma*, and *unhealthy ulcers*, is the *dried* sulphate of zinc, which may be freely dusted over the affected surface. A superficial slough forms, the separation of which may be aided by a poultice. The most efficient escharotic consistent with safety is the chloride. No danger is to be ap-

prehended from its absorption, and the strength of the application may be easily regulated. For the destruction of *malignant growths*, chloride of zinc is applied of varying strength, by the admixture of different proportions of flour, or better, of powdered althea-root, so as to form a paste, sufficient water being added. One part of the chloride to two, three, four, or five parts of flour are the proportions advised by Dr. Canquoin. Instead of flour, the chloride may be mixed with anhydrous sulphate of lime. A very convenient and useful mode of applying chloride of zinc is, to mix it, while in a finely-powdered state, with its weight of gutta-percha melted with as little heat as possible. The mixture may be molded into any desired shape. The so-called "caustic arrows" are nothing more than chloride-of-zinc paste, dried and cut into arrow-like slips. These are inserted into the malignant growth, usually at its base, in order to separate it from the healthy tissues.

The salts of zinc are useful applications to certain forms and stages of skin-diseases. In *eczema*, during the secretory stage, the following may be used: ℞ Zinci oxidi, ʒ ij; glycerinæ, ℥ ij; liq. plumbi subacetat., ʒ jss; aquæ calcis ad ℥ vj. M. Sig.: *Lotion* (Fox). This formula is serviceable also in *impetigo* and *herpes*. An excellent *absorbent powder for excoriated surfaces* is the following: ℞ Corn-meal, finely sifted, ℥ iv; oxide of zinc, ℥ j; iris powder, ℥ ss; oil of almonds, gtts. x. M. The following is recommended by Neumann in *seborrhœa*, when there is inflammation: ℞ Zinci oxidi, ʒ j; plumbi carbonat., ʒ j; cetacei, ℥ j; ol. olivæ q. s. ft. ung. Sig.: *Ointment*. In *erythema*, *intertrigo*, and *eczema*, the following lotion is useful: ℞ Aluminis, ↄ j; zinci sulph., grs. x; glycerinæ, ʒ j; aquæ rosæ, ℥ iv. M. Sig.: *Lotion*. For *erythema* and *herpes*, the following may also be used: ℞ Zinci acetat., grs. ij; aquæ rosæ, ʒ j; ung. aquæ rosæ, ℥ j. M. Sig.: *Ointment*. The ointments of the oxide of zinc and the cerate of the carbonate are excellent applications in many of the cutaneous affections above named.

Probably the most efficient means for treating *gonorrhœa* consists in the use of a weak zinc-injection frequently repeated. ℞ Zinci chloridi, gr. j; aquæ rosæ, ℥ iv—℥ viij. M. Sig.: *As an injection*. ℞ Zinci sulph., grs. viij; aquæ rosæ, ℥ viij. M. Sig.: *As an injection*. After the acute symptoms have subsided, the following injection is very effective: ℞ Zinci sulphat., plumbi acetat., āā grs. viij; ammoniæ muriat., aluminis, āā grs. iv; aquæ rosæ, ℥ j. M. Sig.: *As an injection*.

The sulphate of zinc is very much prescribed by the ophthalmologists in *conjunctivitis*, *otorrhœa*, etc. It is usually associated with morphine and atropine. ℞ Zinci sulphat., grs. ij—grs. viij; morphinæ sulph., grs. ij—grs. iv; atropinæ sulph., gr. ss—gr. j; aquæ rosæ, ℥ j. M. Sig.: *For the eye*.

Authorities referred to:

Fox, Dr. Tilbury. *On Diseases of the Skin*, second American edition.

Gubler, Dr. Adolphe. *Commentaires Thérapeutiques du Codex Medicamentarius*.

Hirt, Dr. Ludwig. *Die Krankheiten der Arbeiter*, erster Theil, Breslau, 1871, p. 97, *et seq*.

Nothnagel, Dr. Hermann. *Handbuch der Arzneimittellehre*, p. 281, *et seq*., *Zink-Präparate*.

Simpson, Sir James Y. *Clinical Lectures on Diseases of Women*, American edition, 1872, p. 195.

Trousseau et Pidoux. *Traité de Thérapeutique et de Matière Médicale*, eighth edition, by Paul.

Waldenburg und Simon. *Handbuch der allgemeinen und speciellen Arzneiverordnungs-Lehre*, Berlin, 1873.

Antimonium.—Antimony. *Antimoine*, Fr.; *Antimon*, Ger.

Antimonii et Potassii Tartras.—Tartrate of antimony and potassium. Tartar-emetic. In transparent crystals, which become white and opaque on exposure to the air. It is wholly soluble in twenty parts of water. The solution yields no precipitate with chloride of barium, or, if very dilute, with nitrate of silver. Hydrosulphuric acid causes an orange-red precipitate. A solution containing one part in forty of water is not disturbed by an equal volume of a solution of eight parts of acetate of lead in thirty-two of water and fifteen of acetic acid. Dose, gr. $\frac{1}{12}$—grs. ij.

Emplastrum Antimonii.—Antimonial plaster. (Not official.) (Tartrate of antimony and potassium, ℥ j; Burgundy pitch, ℥ iv.)

Unguentum Antimonii.—Antimonial ointment. (Not official.) (Tartrate of antimony and potassium, 100 grains; lard, 400 grains.)

Vinum Antimonii.—Wine of antimony. (Tartrate of antimony and potassium, 4 parts; boiling distilled water, 60 parts; stronger white wine to make 1,000 parts.) Nearly two grains to the ounce. Dose, ♏ v—ʒ ij.

Mistura Glycyrrhizæ Composita.—Compound glycyrrhiza mixture. (Brown mixture. Contains extract of glycyrrhiza, paregoric, nitrous ether, and wine of antimony.) Dose, a tea to a tablespoonful.

Syrupus Scillæ Compositus.—Compound sirup of squill. Hive-sirup. (Squill, seneka, tartar-emetic. Contains about three fourths of a grain of tartar-emetic to the ounce.) Dose, ♏ v—ʒ j.

Antimonii Oxidum.—Oxide of antimony. A grayish-white powder, insoluble in water, but readily and wholly soluble in muriatic or tartaric acid. Dose, gr. j—grs. iij.

Antimonii Sulphidum Purificatum.—Purified sulphide of antimony. A dark-gray powder, odorless and tasteless, and insoluble in water or alcohol. Dose, gr. $\frac{1}{4}$—gr. j.

Antimonii Sulphuratum.—Sulphurated antimony is a reddish-brown powder, insoluble in water. Dose, gr. j—grs. v.

In the remarks which follow, tartar-emetic is the only antimonial

preparation referred to, unless otherwise stated. None of the other preparations are employed by modern physicians.

Antagonists and Incompatibles.—Tannic and gallic acids, and vegetable infusions containing them, form an insoluble tannate, and are therefore incompatible. Alkalies and the salts of lead decompose tartar-emetic. It follows that the proper antidotes to poisoning by tartar-emetic are tannic acid and substances containing it. Opium, alcohol, ether, etc., and the antispasmodics generally, are physiologically antagonistic.

Synergists.—The mineral substances of this group promote the action of the antimonials; also the emetics and cathartics, and depressing remedies generally, as veratrum viride, etc.

Physiological Actions.—Tartar-emetic has a sweetish, styptic, and metallic taste. In small medicinal doses, it excites a sensation of warmth in the stomach, followed by nausea, increased flow of saliva and buccal mucus, an abundant secretion of the gastric and intestinal glandular apparatus, and also of the liver and pancreas. In somewhat larger doses—a half-grain to one or two grains—it excites vomiting, first of the contents of the stomach, then of gastric mucus, and afterward of mucus and biliary matters. The alvine dejections are more fluid and increased in number, and consist at first of fluidified fæces; afterward they are made up of a colored liquid, in which there are present biliary matters and some fæces; and, finally, there appears only a colorless or whitish liquid, having flocculi of epithelium floating in it, and bearing a striking resemblance to the "rice-water discharges" of cholera.

The gastro-intestinal symptoms are accompanied by systemic disturbance—paleness of the face, coldness of the surface (sometimes preceded by a very temporary rise of temperature), irregularity and feebleness of the pulse, and great nervous and muscular prostration. When the quantity is sufficient to cause lethal symptoms, they are as follows: epigastric pain, vomiting and purging, shrunken features, cold breath, cyanosis, arrest of the urinary secretion, aphonia, cramps—the assemblage of symptoms belonging to the collapse of cholera.

Tartar-emetic, when used in considerable medicinal doses, sets up an irritation of the fauces followed by aphthous ulcerations, which continue along the œsophagus to the stomach, and are accompanied by salivation and painful deglutition.

Applied to the skin by friction, tartar-emetic excites a follicular inflammation, succeeded by a papule, a vesico-pustule, a surrounding inflammation with indurated base, a central umbilication, and finally desiccation, terminating in a brownish scab. These antimony-pustules are very similar to those of vaccine or variola.

When applied to the skin or injected into the veins, tartar-emetic is absorbed, and manifests a selective action on the gastro-intestinal

mucous membrane, causing the same irritant effects as are produced by its stomach administration. It is, therefore, a specific, and not a merely irritant emetic.

Tartar-emetic readily diffuses into the blood. In what form, unless as an albuminate, it exists in the blood, is not understood. It diminishes the number and force of the arterial pulsations, and rapidly lowers the blood-pressure. The pulse may fall from 72 to 40, but, according to Hirtz, rarely is the number reduced more than 6 to 10 per minute. In the healthy subject, the normal temperature, even when a full medicinal dose has been administered, remains unaffected as to the trunk, but it may be reduced in the extremities. In fevers and inflammations, a considerable reduction of temperature may take place, and the same result has been noted in the physiological state when the quantity of tartar-emetic has been sufficient to produce choleriform symptoms.

In man delirium, and in animals paralysis, motor and sensory, but without impairment of muscular contractility, have been observed from lethal doses of tartar-emetic.

Tartar-emetic promotes waste and hastens the elimination of the products of waste—the excretion both of carbonic acid and of urea being greatly increased by it.

The antimonial salts are found in the blood, in the liver, and other viscera, and are excreted by the bile, the milk, the perspiration, and the urine. It is, doubtless, also largely excreted by the intestinal glandular apparatus, as is the case with the metals generally.

If tartar-emetic is administered in small doses, and the quantity be gradually increased, the nauseating effects of the drug may be entirely prevented. When emetic doses even are continued in some subjects, this effect finally ceases, and the drug is borne without producing any gastric symptoms. To this state has been applied the term *tolerance*, by the contra-stimulant school of practitioners. It must not be lost sight of, that this tolerance, on the part of the stomach, of large doses does not mean an indifference to the action of the remedy, but very serious and profound anatomical alterations may result.

Therapy.—Tartar-emetic was, formerly, much more frequently prescribed than at present as an *emetic* in cases of *indigestion* characterized by a coated tongue, loaded stomach, and anorexia (*l'embarras gastrique*). It is sometimes used as an emetic in cases of *narcotic poisoning*, but sulphate of zinc is preferable. It was formerly used as an emetic in the first stage of *typhoid and other fevers*, but, notwithstanding this practice is frequently followed by good results, it is now rarely pursued. If emesis is desirable in these cases, a less irritating and depressing emetic should be used.

In *croup* tartar-emetic is an efficient emetic, but it must be used

with caution, owing to the great depression which it produces, and the fatal result which has occurred in many instances. It is not a suitable remedy for infants and very young children. The compound sirup of squills is a domestic remedy for croup, but the incautious use of this has proved fatal. Tartar-emetic is used in *laryngismus stridulus* to produce emesis and consequent relaxation of the muscles of the larynx, and in *true croup* to cause the expulsion of the false membrane. The yellow subsulphate of mercury is safer and quite as effective.

Tartar-emetic is an excellent remedy in the first stage of *acute catarrh, nasal, pharyngeal, and bronchial.* It is most efficient in the first stage, when the mucous membrane is dry and swollen. It promotes secretion, diminishes fever, induces diaphoresis, and hastens the elimination of inflammatory products. In these cases, from one twentieth to one twelfth of a grain is usually a sufficient quantity, for it is not necessary that nausea be excited. When cough is violent, a little opium may be added to the prescription. ℞ Antimonii et potassii tart., gr. ss ; morphinæ acetat., gr. ss ; aquæ, ʒ ij. M. Sig. : *A teaspoonful every hour or two.* In *acute bronchitis*, when the cough is dry and hoarse, this agent is useful, and small doses (one sixteenth of a grain), frequently repeated, are more serviceable than large doses at longer intervals.

Formerly, under the influence of the contra-stimulant school, tartar-emetic was given in large doses in *pneumonia.* It was sought to establish *tolerance* at an early period, and to administer the largest doses which could be borne. The comparative results of this method of treatment and of the expectant and restorative plans demonstrate the impropriety of the tartar-emetic treatment, and it is now abandoned. It is true that small doses of tartar-emetic, by increasing the action of the skin, kidneys, and intestinal canal, may exert a favorable influence over the temperature and diminish the plasticity of the exudation ; but even small doses must be employed with care, lest a depression should be induced which may interfere seriously in the natural course of a disease which is self-limited and has its period of crisis.

Tartar-emetic gives great relief in *spasmodic asthma when the bronchial secretion is deficient*, and in those cases brought on by an overloaded stomach. In the former case small doses frequently repeated until very slight nausea is produced, and in the latter emetic doses, are necessary. The following is a useful form of expectorant in the acute inflammatory affections of the air-passages : ℞ Antimonii et potassii tart., gr. j ; ammonii muriat., ʒiv ; ext. glycyrrhizæ, ʒj ; morphinæ muriat., gr. j ; syrup. tolutan., aquæ lauro-cerasi, āā ʒ j. M. Sig. : A teaspoonful every two, three, or four hours.

The ointment of tartar-emetic was formerly much employed to produce *pustulation of the chest* in the more *chronic pulmonary diseases.* This painful and disfiguring form of counter-irritation has passed out

of use. To produce a crop of variolus-like pustules on the skin does not cause a morbid process like caseous pneumonia or tuberculosis to cease its ravages ; on the contrary, such extensive suppuration in the skin rather favors the development of these diseases.

A combination of tartar-emetic and opium is a serviceable *hypnotic* in some cerebral disorders. These remedies appear to be most useful when *wakefulness and delirium are due to cerebral congestion*, and in those subjects who become excited and wakeful from the use of opium alone. In the *active delirium and wakefulness of typhoid fever*, tartar-emetic and opium are prescribed : ℞ Antimonii et potassii tart., gr. j—grs. ij ; morphinæ sulph., gr. jss ; aquæ lauro-cerasi, ʒ j. M. Sig. : *A teaspoonful every two, three, or four hours.* In *delirium tremens*, when the same conditions exist, the same combination may be prescribed. Since the introduction of chloral and bromide of potassium, however, the use of these drugs for the purposes just indicated has been much restricted.

In acute inflammatory and febrile diseases, minute doses of tartar-emetic (gr. $\frac{1}{16}$), frequently repeated, render an incontestable service. *Typhoid, typho-malarial, and remittent fevers, acute rheumatism, erysipelas*, etc., are maladies thus benefited. This remedy is, of course, contraindicated when there is much irritability of the stomach and intestinal canal. *At the outset of fevers* it was formerly the custom to prescribe an active emetic, and good results certainly followed this practice. The author believes that he has frequently seen impending attacks of *malarial fever* aborted by emetic doses of antimony and ipecac. Free emeto-catharsis moderates the severity of *remittent fever* in robust subjects when produced in the incipiency of this disease, and also puts the mucous membrane in a better state for the disposition of medicines and food.

Before the days of anæsthesia tartar-emetic was much used to relax the *muscular system* for the *reduction of dislocations*, to *facilitate the taxis in strangulated hernia*, to *relax rigid os and perineum in labor*, etc., but it is now no longer employed for these purposes.

Authorities referred to :

Gubler, Dr. A. *Commentaires Thérapeutiques du Codex Medicamentarius*, p. 624, *et seq.*

Hermann, Dr. L. *Lehrbuch der experimentellen Toxicologie*, p. 218, *Antimonsalze.*

Nothnagel, Dr. Hermann. *Handbuch der Arzneimittellehre*, p. 218, *et seq.*, *Antimon-Präparate.*

Radziejewsky, Dr. S. *Schmidt's Jahrbücher der gesammten Medicin*, vol. cliii, p. 10, *Zur Wirkung des Antimon.*

Taylor, Dr. A. S. *On Poisons*, American edition, p. 476.

Trousseau et Pidoux. *Traité de Thérapeutique et de Matière Médicale*, edition by Paul, huitième édition, vol. ii, p. 951.

Cadmium.—Cadmium. *Cadmium*, Fr. ; *Kadmium*, Ger. (Not official.) *Cadmii Sulphas.*—Sulphate of cadmium.

Action and Uses.—There is a strong resemblance—an identity of action, indeed—between zinc and cadmium, except that the latter is the stronger. Cadmium has a decidedly caustic and astringent taste; it is powerfully nauseant and emetic, producing great depression of the powers of life. Locally the effects are those of an irritant poison, and the systemic effects correspond; although there are produced such cerebro-spinal symptoms as coma and convulsions. This agent is not administered internally, the preparations of zinc being preferred for all purposes to which cadmium might be applied as a remedy.

In ophthalmic practice, cadmium seems to be much esteemed as a *collyrium*. It is held to possess special powers in causing absorption of *opacities of the cornea:* ℞ Cadmii sulph., grs. ij; aquæ rosæ, ℥ j. M. Sig.: *Collyrium*. A solution of the same strength is said to be an excellent local application in *otorrhœa*. There is no doubt that cadmium is an efficient injection in *gonorrhœa;* but it is important in the application of this, as of so many other astringent remedies, that it be not too strong—one grain of cadmium sulphate to four ounces of water being sufficient in most cases.

An ointment of cadmium is used somewhat by French physicians, in the treatment of external affections. For this purpose we may direct ten grains of the sulphate to be intimately incorporated with an ounce of simple ointment.

Cerium.— *Cerii Oxalas.*—Oxalate of cerium. A white powder, insoluble in water, alcohol, and ether. Dose, two to five grains in pill-form, as it is insoluble in the ordinary menstrua. It may be suspended in mucilage.

Sir James Simpson was the first to propose the use of oxalate of cerium to restrain *vomiting* arising from various causes, especially from *pregnancy;* and he brought forward many cases illustrative of its value. As he pointed out, it sometimes succeeds immediately, but usually the best effects are experienced after several days' use. The oxalate of cerium sometimes succeeds remarkably in vomiting due to serious organic lesions, as in cancer (Peters). It has been narrated in one case, that four grains were administered every two hours until about 600 grains were taken. The good result which followed this large administration of the drug indicates that, in vomiting from similar causes, larger doses may be sometimes necessary to secure the best curative effects. In *chronic diarrhœa*, cerium may take the place of bismuth.

In cases of *cough* associated with vomiting, excellent results have been obtained from the oxalate of cerium. It is probable that the cough is reflex in origin, the point of irritation existing in the terminal filaments of the pneumogastric in the gastric mucous membrane.

Metallotherapy.—*Definition and Historical Development.*—By the term *metallotherapy* is meant a curative method in which metals are applied to the affected area.

The alchemists entertained extravagant notions of the therapeutical results to be achieved by the application of metals to the surface of the body. The influence of the noble metals over the bodily functions has been believed in from the remotest times within the historical period, and this belief has been acted on by many influential persons down to nearly our own era. The action of magnetic iron contributed to this mystical notion. Then came the wonder-working Mesmer. To the action of magnets was added that mysterious force evoked by the agencies employed by the Mesmerists. From such elements a pretended system of cure was elaborated, and a great many charlatans throve on the profits of this "system" of practice. Probably the most sustained success in this department of popular fallacies was effected by Dr. Perkins, of Connecticut, who invented a combination of metals arranged in the form of a cylinder, about six inches in length and two inches in circumference, which he called a *tractor*. Provided with a suitable handle, the tractor was slowly passed over the affected area, and the morbid process was drawn out or dispersed. Perkins's tractors excited great interest in this country, and in England an immense enthusiasm. An institution—known as the Perkinian Institute—was established in London, and many of the nobility and gentry resorted to it to be cured by the application of the tractors. In a book published by the son, there may be found many certificates of cures thus effected. These results are the less surprising when interpreted by the aid of subsequent developments from metallotherapy. Mesmer, Perkins, Hahnemann, appeared nearly simultaneously, and each had an influence on the thought of the time.

Metallotherapy, as now understood, had its origin in the experiments of Dr. Burq, which were first announced in a note addressed to the Academy of Sciences, and subsequently embodied in his thesis for the medical doctorate in 1851. He stated that a plate of metal—a silver coin, for example—applied to the skin, may remove the paralyses of motility or of sensibility occurring in hysteria; that the same metal was not equally successful in all cases, and that idiosyncrasies exist, so that in respect to each individual there is a special metal, active and curative. In one subject it may be gold, in another silver, and in a third copper, which has the power to restore the lost motility or sensibility. Burq also maintained that the same metal taken internally, whether in the form of a natural mineral water or in a pharmaceutical preparation, produced the same result. In other words, when a piece of metal, a coin, selected according to the special sensibility of the subject, is applied to an hysterical patient having permanent hemianæsthesia, the return of the normal sensibility is effected in from ten to twenty minutes