bleed with every motion. The enema of aloes, in quantity corresponding to the age of the subject, is an efficient remedy for the destruction of *ascarides vermiculares.*

The purgative enemata above given are employed to act on the large intestine, chiefly by virtue of reflex stimulation, but, in part, absorption of the purgative principle takes place, whence it follows that they may affect the whole canal. They are used, therefore, as cathartics, and for the ordinary purposes of these remedies. The purgative enemata are not suitable for habitual use. They excite irritation of the rectum, which may result in ulceration, ischio-rectal abscess, *fistula in ano*, fissure of the anus, and other serious accidents.

Irrigation of the bowel is resorted to for the removal of *impacted fæces*, to overcome *intussusception*, etc.

Cases of intestinal invagination have been very quickly relieved by sudden inflation of the large intestine with carbonic acid. The process consists in the injection of a solution of sodium bicarbonate, followed by a solution of tartaric acid—about one drachm of each to eight ounces of water. The escape of the gas through the *sphincter ani* must be prevented by forcible pressure upon the anus.

Suppositoria Aloës.—(Aloes and cacao-butter.) Each suppository contains about five grains of purified aloes. One of these, introduced into the rectum at night, will generally procure one or two evacuations on the following day. It is not good practice to employ such a method of treatment frequently.

A piece of hard white soap cut into a conical shape, and of a suitable size, is frequently used in domestic practice to relieve the *constipation of infants.* The soap suppository thus prepared is carefully introduced into the rectum. The habit of a daily evacuation may be thus induced. A piece of paper rolled into a conical shape, and dipped into oil, may be used instead of the soap suppository.

ANTHELMINTICS.

Anthelmintics are remedial agents used to cause the expulsion of parasites from the intestinal canal. *Vermifuges* are remedies which expel worms; *vermicides* are remedies which kill as well as expel worms. Some of these agents act mechanically, as mucuna and powdered tin; others are administered in such quantity as to sicken and disable the worms, when their expulsion is easily effected: for example, pumpkin-seed emulsion. Others again possess narcotic and toxic properties, as turpentine, chenopodium, santonin, etc.

Anthelmintics are conveniently divided into those employed against ascarides vermiculares, those employed against ascarides lumbricoides, and those employed against the different varieties of tænia.

Ascarides vermiculares infest the rectum and large intestine, extending up occasionally as high as the ileo-cæcal valve; in females, they may also spread into the vagina. As they deposit their ova in the folds of the anus, and in the vagina, it is obvious that the parasiticide, to be effective, must be applied in these situations.

Infusion of quassia, decoction of aloes, and a weak solution of carbolic acid, are the most frequently-prescribed remedies for the destruction of ascarides. If carbolic acid is used, the strength of the injection for children should not exceed ten grains to the pint, and it should not be retained. Infusion of quassia is at the same time safe and effective; but, when this injection is used, a solution of carbolic acid should be applied also, by means of a sponge, to the folds of the anus, and, in the case of female children, to the external genitals. If the ascarides extend up into the large intestine beyond the sigmoid flexure, a dose of santonin and calomel should precede the use of the rectal parasiticide.

REMEDIES USED FOR THE EXPULSION OF ASCARIDES LUMBRICOIDES.

Mucuna.—Cowhage. The hairs of the pods of *Mucuna pruriens.* This remedy is now rarely if ever used. It is administered in the form of electuary, mixed with molasses. A teaspoonful or more of the mixture should be administered fasting, and after the action of a cathartic. When several doses have been taken a brisk purgative should be given.

When cowhage is applied to the skin it excites intense itching, inflammation in the skin, and pustulation. It has been proposed as a counter-irritant, but a more disagreeable one could hardly be conceived. It is very irritant to the intestinal mucous membrane, as it is to the skin, and an action is speedily set up for its expulsion. When by the use of a purgative, and by reason of fasting, intestinal worms are uncovered and exposed to attack, it is held that the mucuna-hairs pierce the parasites and irritate them, so that their stay in the intestine is rendered intolerable. In consequence of the active peristaltic movements induced by the cowhage, and by the purgative with which it is followed, the worms are hurried out with the remaining contents, if any, of the intestines.

Santonica.—Santonica. The unexpanded flowers of *Artemisia maritima*, var. *Stechmanniana* Besser (Nat. Ord. *Compositæ*). (U. S. P.) *Semencine*, Fr.; *Wurmsamen*, Ger.

Composition.—Resin, malic acid, essential oil, and a crystallizable principle (*santonin*).

Santoninum.—Santonin. A neutral principle obtained from santonica. A colorless substance, crystallizing in shining, flattened prisms,

without smell, and nearly tasteless when first put into the mouth, and afterward bitter. It is not altered by the air, but becomes yellow on exposure to light. Nearly insoluble in cold water, it is dissolved by two hundred and fifty parts of boiling water. It is soluble in forty-three parts of cold, or in three parts of boiling alcohol, and in seventy-five parts of ether. Dose, gr. ss—grs. v, according to age.

Trochisci Santonini.—Troches of santonin. (Not official.) (Santonin, ʒ ss ; with sugar, tragacanth, orange-flower water, to form four hundred and eighty troches.) Each troche contains a half-grain of santonin.

Antagonists and Incompatibles.—We do not possess any satisfactory data in regard to the physiological antagonists of santonin. When a poisonous dose has been taken the stomach should be emptied, and the systemic effects should be treated symptomatically.

Synergists.—Therapeutically the action of santonin is aided by cathartics, especially by calomel.

Physiological Actions.—In ordinary medicinal doses as used for the expulsion of lumbrici, santonin causes no sensible intestinal disturbance. In considerable doses nausea and vomiting are produced, and are followed by colic and diarrhœa. Santonin enters the blood, probably, in combination with soda, for, although it has no acid properties, it has the power to form such combinations. Santonin, according to Hesse (Flückiger and Hanbury), is the anhydride of a crystallizable acid, which, when heated, is resolved into santonin and water. Vision is affected in a remarkable manner. Usually all objects appear as if viewed through yellow glass ; but other colors sometimes appear, as green, blue, or even red (*Gelbsehen*, Rose). The chromatopsia is probably due, according to Rose, to the solution of santonin in the alkaline serum, and its action on the perceptive centers (vol. xviii, page 26). In passing out with the urine santonin imparts a yellowish, and, when the amount is large, a reddish-purple, hue to this fluid.

In toxic doses santonin produces very decided cerebral effects : trembling, vertigo, convulsive movements, tetanoid cramps, stupor, cold sweats, dilated pupils, insensibility, etc.

Therapy.—Cures of *amaurosis* have been reported from the use of santonin, but we possess no exact indications for its administration. It is, probably, effective only in functional derangement. The chief use of this remedy is for the expulsion of *ascarides lumbricoides*. It is the most effective and pleasant remedy which can be employed for this purpose. A convenient form for administration is the troche, or it may be prescribed in a powder with calomel. The following is a successful plan of using this parasiticide : A laxative in the morning, fasting through the day, a dose of santonin and calomel at bedtime, a senna-draught on the following morning.

Authorities referred to :

Brown, Dr. Dyce. *Schmidt's Jahrbücher*, vol. cl, p. 138.
Flückiger and Hanbury. *Pharmacographia*, p. 347.
Hermann, Dr. L. *Lehrbuch der exper. Toxikologie*, p. 383.
Husemann, Drs. Aug. und Theod. *Die Pflanzenstoffe*, p. 927.
Köhler, Prof. Dr. Hermann. *Handbuch*, vol. ii, p. 1292.
Rose, E. *Virchow's Archiv*, vols. xvi, xviii, xix, xx, xxviii.

Spigelia.—Pink-root. The rhizoma and rootlets of *Spigelia Marilandica* Linné (Nat. Ord. *Loganiaceæ*). (U. S. P.)

Extractum Spigeliæ Fluidum.—Fluid extract of spigelia. Dose, ʒ j—ʒ ss.

Composition.—A bitter, uncrystallizable principle (*spigelin ?*), volatile oil, tannic and gallic acid.

Actions and Uses.—In moderate doses spigelia produces a sensation of warmth at the epigastrium, stimulates the intestinal movements, accelerates the action of the heart, and promotes the cutaneous transpiration. In large doses it causes cerebral effects, vertigo, dimness of vision, dilated pupils, convulsions, and insensibility. Many of the serious symptoms supposed to have been produced by it in certain cases were probably really due to pre-existing cerebral lesions. Cases of basilar meningitis, for example, have not unfrequently been confounded with "worm-fever." Any vermifuge, given under these circumstances, might seem to have caused the head-symptoms which are characteristic of the brain-lesions.

Spigelia is used only as a vermifuge, and against the *round worm*, for the expulsion of which it has proved to be very efficient. A low diet and a brisk cathartic should precede the use of this remedy. The best form for administration is the fluid extract of senna and spigelia.

Authorities referred to :

Porcher, Dr. F. P. *Resources of the Southern Fields and Forests.*
Stillé, Dr. Alfred. *Therapeutics and Materia Medica.*

Chenopodium.—Worm-seed. The fruit of *Chenopodium anthelminticum* Gray (Nat. Ord. *Chenopodiaceæ*). (U. S. P.)

Oleum Chenopodii.—Oil of worm-seed. Dose, gtt. v—gtt. xv.

Actions and Uses.—The oil of worm-seed is the only preparation of the plant now used, and this is rarely employed, in consequence of its very disagreeable and characteristic odor and taste. It excites a sensation of warmth at the epigastrium, increases the action of the heart, and promotes cutaneous, bronchial, and renal secretions. It is a diffusible stimulant, and as such may be given with advantage in *hysteria* and *chorea*, as a carminative in *flatulence*, and as an antiperiodic in *intermittents*. The only use of worm-seed is as a remedy for ascarides lumbricoides. It is one of the most efficient of the class. It

should be given three times a day for two days, and followed by a brisk cathartic. An excellent combination for the expulsion of the round worm is ten drops of worm-seed oil, and a teaspoonful of fluid extract of senna and spigelia. It may also be administered in castor-oil.

REMEDIES USED AGAINST TÆNIÆ.

The success of tæniafuges depends largely upon the preliminary treatment. The parasite is imbedded in mucus, its hooklets fixed in the mucous membrane. The medicament which is administered for its expulsion must come in contact with the scolex. To dislodge a quantity, however large, of the segments (*strobila*), although temporary relief may follow, will not be permanently curative. The head of the parasite must be expelled.

Before using the tæniafuge the contents of the intestinal canal must be thoroughly evacuated.

Two days of fasting, some milk and bread only being taken, must precede the treatment.

Aspidium.—Male fern. The rhizoma of *Aspidium filix mas* Swartz, and of *Aspidium marginale* Willdenow (Nat. Ord. *Filices*). (U. S. P.) *Fougère mâle*, Fr.; *Wurmfarnwurzel*, Ger.

Oleo-resina Aspidii.—Oleo-resin of fern. Dose, ʒ ss—ʒ ij.

Composition.—A green, fatty oil, volatile oil, resin, tannin, etc. The ethereal extract deposits a granular, crystalline substance (*filicic acid*), on which the medicinal activity of the drug appears to depend.

Actions and Uses.—The oleo-resin of filix mas is a very efficient remedy for tape-worm, especially the unarmed variety; but, if suitable precautions be taken to insure success, it is quite a certain remedy for the armed tænia. The method of Trousseaux and Pidoux is as efficient as any (vol. ii, page 1040). On the first day, a strictly milk diet; on the morning of the second day, four grammes (about ʒ j) of the oleo-resin in four doses, with an interval of a quarter of an hour between each; on the third day, the same quantity at the same intervals, followed by fifty grammes of the sirup of ether, and, a half-hour later, an emulsion containing three drops of croton-oil. Kuchenmeister gives a number of methods, and Cobbold favors the employment of male fern in certain cases.

Granatum.—Pomegranate. The bark of the root of *Punica granatum* Linné (Nat. Ord. *Granitaceæ*). (U. S. P.) *Écorce de racine de grenadier*, Fr.; *Granatwurzelrinde*, Ger.

Composition.—Pomegranate-bark contains a principle—*pelleterine*—on which its activity depends. The tannate, an efficient tæniafuge, can be given in doses of five grains to one scruple.

Actions and Uses.—The rind of the fresh root only should be used.

The best preparation is the decoction, prepared by boiling gently two ounces of the bark in a quart of water down to a pint. Of this decoction a wineglassful may be given every hour until all is taken. It should be preceded by a brisk purgative, and should be taken fasting. It produces more or less nausea, borborygmi, intestinal pain, and usually purges. If a purgative effect is not caused by it, a brisk cathartic should follow. In the author's experience, this is a very certain and efficient tæniafuge. Tauret's preparation of unpurified pelleterine, in solution, has acted very efficiently in some cases.

Brayera.—Kousso. The female inflorescence of *Brayera anthelmintica* Kunth (Nat. Ord. *Rosaceæ*). (U. S. P.) *Brayère anthelminthique*, Fr.; *Kussoblüthen*, Ger.

Extractum Brayeræ Fluidum.—Fluid extract of brayera. Dose, ʒ ij—ℨ j.

Infusum Brayeræ.—Infusion of brayera (six parts to one hundred of water). Dose, ℨ iv—ℨ viij—Oj, or more.

Composition.—Brayera contains an active principle (*kosin*, or *koussin*), which crystallizes in rhombic prisms. Kosin appears to be inert of itself, and is active only when combined with the other constituents of the drug.

Actions and Uses.—Kousso is used solely as an anthelmintic. Opinions vary as to its utility. On the whole, it may be said that the first enthusiasm which attended its introduction into practice has died away. It brings the segments, but rarely expels the head of the parasite. It is necessary to take it in large quantity—half an ounce—mixed with water. It is retained with difficulty, and produces much intestinal distress. When successful, the worm is brought away without the action of a purgative.

Kamala.—Kamala. The glands and hairs from the capsules of *Mallotus Philippinensis* Mueller Arg. (Nat. Ord. *Euphorbiaceæ*). (U. S. P.) Dose, ʒ j—ʒ iij.

There are no official preparations. A saturated tincture may be given, in the dose of one to three drachms.

Actions and Uses.—It is an orange powder. It causes some nausea and griping, usually, but it may operate without producing any unpleasant sensations. It acts as a purgative, and causes the expulsion of the worm. If one dose is insufficient, its administration should be continued every three hours until five or six doses have been taken. Kamala is effective not only against tape-worm, but also against lumbrici and ascarides vermiculares.

Pepo.—Pumpkin-seed. The seed of *Cucurbito pepo* Linné (Nat. Ord. *Cucurbitaceæ*). (U. S. P.)

Actions and Uses.—This is one of the most efficient remedies which

we possess against tænia. Two ounces of the fresh seed are pounded in a mortar, with a half-pint of water, until the husks are loosened and an emulsion is made. The mixture is then strained, and the whole amount is taken fasting; but Squibb maintains that all should be taken, husks included. If an action of the bowels does not take place in two hours, the emulsion should be followed by castor-oil. If success is not attained, the dose may be repeated each morning until the parasite is produced. Numerous cases of successful use of pumpkin-seed emulsion have been reported.

The expressed oil, which is bland and unirritating, like almond-oil, may be used as a substitute for the seeds. It should be given in the dose of a half-ounce, two or more times, and after several hours followed by castor-oil. The rules already given, in regard to preliminary treatment, should also be followed.

Authorities referred to:

Cobbold, T. Spencer. *On Parasites.* Also various articles in *The Medical Times and Gazette*, 1875.

Husemann, Dr. Theodor. *Handbuch, op. cit.*, erster Band, p. 202.

Köhler, Dr. Hermann. *Handbuch der physiologische Therapeutik*, zweiter Band, p. 1292.

Küchenmeister, Dr. Frederick. *On Animal and Vegetable Parasites*, Sydenham Society, vol. i, p. 147, *et seq.*

Stillé, Dr. Alfred. *Therapeutics and Materia Medica*, vol. ii.

Squibb, Dr. Edward. *The Ephemeris*, 1883.

URINO-GENITAL REMEDIES.

These remedies are employed chiefly for their action on the genito-urinary passages. They stimulate the kidneys to increased activity, and excite the functions of the pelvic viscera. In excessive quantity, or long continued, they may set up inflammation of the kidney, produce strangury and bloody urine, excite uterine contractions, and stimulate to an unnatural degree the sexual propensities. They contain an essential oil, or principle, which makes its exit by the urinary passages and excites local irritation by direct contact.

Terebinthina.—Turpentine. A concrete oleo-resin obtained from *Pinus australis* Michaux, and from other species of *Pinus* (Nat. Ord. *Coniferæ*). (U. S. P.)

Oleum Terebinthinæ.—Oil of turpentine. A volatile oil distilled from turpentine. (U. S. P.) *Essence de térébinthine*, Fr.; *Terpentinöl*, Ger. Dose, ♏ v—℥ ss.

Linimentum Terebinthinæ.—Liniment of turpentine. (Resin cerate, sixty-five parts; oil of turpentine, thirty-five parts.)

Antagonists and Incompatibles.—All remedies increasing waste, and the vaso-motor depressants, counterbalance the therapeutical actions of turpentine. In cases of poisoning the stomach should be promptly emptied, and anodynes and demulcents should be administered. Elimination should be favored, and the toxic symptoms treated according to the systemic indications. Ozonized oil of turpentine is an antidote to phosphorus, preventing the formation of phosphoric acid and converting the poison into an insoluble spermaceti-like substance. Turpentine worn in a vial about the neck prevents necrosis of the jaw and steatosis of organs in workmen engaged in manufactures employing phosphorus.

Synergists.—The diffusible and alcoholic stimulants favor the action of turpentine.

Physiological Actions.—Turpentine-oil is a limpid, colorless fluid, having a strong, peculiar, and diffusive odor, and a hot and pungent taste. It is very slightly soluble in water. The oil exposed to the air absorbs oxygen (ozone), which it retains with great tenacity. Applied to the skin, turpentine causes heat, redness followed by a vesicular eruption, and sometimes by intractable ulcerations. A few drops produce a sense of heat at the epigastrium, and a large dose (medicinal) causes intense burning pain, nausea, eructations of the oil, intestinal irritation and purging (usually). Notwithstanding its slight solubility in water, turpentine diffuses into the blood with facility, and is quickly recognized in the breath, sweat, and urine. The action of the heart and arteries is increased by it, the arterial tension rises, and a general sense of warmth and exhilaration is experienced. In large doses (one or two ounces) vomiting, thirst, and a febrile state, are induced; the muscular strength is diminished, the power of co-ordination is impaired; exhilaration of mind, incoherence of ideas, and rambling insensibility, follow. In toxic doses there are complete muscular relaxation and profound insensibility with abolition of all reflex movements; the face is flushed or cyanosed, the pupils usually dilated, and the breathing labored and stertorous. All the organs by which turpentine is eliminated, especially the kidneys, suffer from extreme irritation when large doses have been swallowed. The skin is usually moist, and exhales a turpentine-odor; the bronchial secretion is increased, and convulsive coughing is induced; the urine is scanty and bloody, and there is violent strangury. The only fatal cases which have been reported have occurred in children (Taylor). From four to six ounces have not destroyed life in adults.

As regards its action on the organs of circulation, the author's experiments show that turpentine stimulates the vaso-motor nervous system when administered in moderate doses. A large quantity quickly exhausts the irritability of the sympathetic ganglia, the action of the heart becomes weak, and the arterial tension falls; the respira-