

**GROUP X**  
**Agents Acting Upon Micro-organisms and Parasites**

**CHAPTER II.**  
**Agents Acting upon Intestinal Parasites—**  
**Anthelmintics.**

**SANTONICA**  
**SPIGELIA**  
**ASPIDIUM**  
**CHENOPODIUM**  
**CONVOLVULUS**  
**MALLOTUS**  
**KOUSSO**  
**POMEGRANATE**

**SANTONICA.**                      *Artemisia pauciflora.*

Synonym—Levant Wormseed.

**CONSTITUENTS—**

Santonin, volatile oil, gum, resin.

**PREPARATIONS—**

**Santonin** is a crystalline neutral principle, derived from Santonica. it occurs in the form of shining, colorless, or slightly yellowish, flattened, prismatic crystals, odorless, and at first tasteless, but subsequently bitterish. Nearly soluble in cold water, soluble in 250 parts of boiling water, and in forty parts of alcohol. Slightly soluble in chloroform and ether.

**TrochesciSantonine**, Troches of Santonine. Dose, from one to six troches. Santonin. Dose, from one-fourth to two grains.

**Physiological Action**—Five grains of santonine given to a child caused pain in the stomach, convulsions, insensibility and death. Various phenomena are produced by even smaller doses, as everything appearing yellow or red throughout the field of vision; urine stained deep yellow; a punctiform rash or an eruption like that in measles; amaurosis, flushed face, hot head, twitching of the eyeballs, dilatation of the pupils, foaming at the mouth, clenching of the teeth, jerking of

the arms, stertorous breathing. Two grains caused the death of a feeble child.

Generally, recovery takes place after these symptoms, but occasionally death follows.

**Specific Symptomatology**—The following indications, seldom all present at the same time, point to the presence of lumbricoid worms in the alimentary canal. They may also be present in part, induced by various other causes of intestinal irritation. There may be intense itching of the nose in children, the child rubbing or boring the nostrils, with bloated abdomen, restless sleep, crying out in affright, grinding of the teeth at night, groaning in sleep, complete loss of appetite, tongue deep red without coating, deficient saliva, nausea, vomiting, fetid breath depraved, erratic appetite with longings, great thirst, aversion to food, abdomen enlarged and hard, diarrhea with whitish, slimy stools, or bowels constipated followed by looseness, colicky pains in the bowels, vomiting and purging after meals, worms discharged with the stools, cramps in the bowels at night, itching at the arms, limbs wasted, face pale, skin sallow and unhealthy looking, constant urging to urinate, wetting the bed, urine whitish and cloudy, scalding, dry, hacking, constant cough, tickling in the larynx and trachea, convulsive movements of the hands and arms, sensitiveness to the touch over the whole body, twitching of the muscles, lividity of the face, arrested breath, severe choking sensations, convulsive contraction of the fingers, general convulsions with violent agitation of the limbs, chorea, haziness of sight, loss of consciousness, restlessness, not satisfied with anything, will not sleep, fever occurring daily, usually in the afternoon.

**Therapy**—The generally accepted influence of santonine is in the line of its anthelmintic properties. It is an excellent remedy for the long worm—*ascaris lumbricoides*. It is given in doses of from one-half to one grain, twice or three times daily. In the above symptomatology, however, I have named a long list of symptoms, which are due to **intestinal** or **gastro-intestinal irritation**. In a few cases they may be due to other reflex influences. Many of these symptoms should be treated with santonin, without regard to the presence of worms. In fact, if we properly study this remedy, we must put aside entirely the idea of its anthelmintic properties, and consider it as a nerve sedative, as an antispasmodic and as a positive and reliable agent with which to

relieve, **nerve irritations**, especially those of a **reflex** character.

I have made some very conclusive observations in the past fifteen years that convince me that this remedy is the best remedy we have with which to relieve reflex irritation, when the cause of the irritation cannot be at once determined. This is an entirely new field for santonin. I was once treating a child who suffered from all the symptoms of nerve irritation which are present with worms. I gave santonin to remove the worms. Santonin relieved the nervous irritation in a most satisfactory manner, but subsequent observation proved that there were no worms present, but that the irritation was due to faulty digestion and decomposition of food. I was at once impressed that the agent had relieved the irritation by its influence upon the nervous system, independent of any action it might have had upon the worms.

From this observation, I began at once to administer it in all cases where there was **reflex irritation**. I was consulted concerning a child seven months old, who had a **persistent hacking cough** from its birth, which resisted all treatment. I allayed the cough in twenty-four hours with half grain doses of santonin, and the cure was permanent.

I was consulted concerning an irritable heart in an old lady, who was so enfeebled from the violent and irregular action of the organ that she had not been able to do anything whatever for over two years. The heart disorder did not seem to be sufficient to cause the extreme weakness, and I treated it with santonin, as a case of reflex irritation. The results were indeed most surprising. The patient was around the house and assisting with the work within less than a week.

A physician reported a case to me that was suffering from persistent protracted fever, with nervous phenomena, that showed it to be of reflex origin, as all other causes were excluded in the examination. After all known methods had failed, three doses of santonine, one grain each, reduced the temperature almost to normal, and that agent alone caused the permanent abatement of the fever.

I advise with full assurance of satisfactory results, that this remedy be used freely in the treatment of reflex irritations. I do not think it will be found necessary to give it in large doses. From one-half a grain to a grain and a half in an extreme case, will, I think, be sufficient.

I would suggest that it be carefully used in the reflex irritations of pregnancy, especially when there is scanty urine, or when there is deficiency of renal action, with much local irritation. Also in the beginning stages of the **albuminuria of pregnancy**. I am confident that it will do much towards preventing **puerperal convulsions** if given early. I think there are some cases of the **vomiting of pregnancy** that will be quickly allayed by it. I advise that it be given in **hysterical** conditions, and in those difficulties where there is **irritation** of the **ovaries** and irritation at the menstrual epoch, especially if accompanied with some pain.

Lydston advised the use of this remedy in large doses in the treatment of **epilepsy**. Its antispasmodic properties would suggest that it be used in cases where the spasms are due to reflex irritation; whether it possesses sufficient antispasmodic properties to control spasm, as gelsemium, chloral and other agents of that character do, remains to be proven.

Santonine at times is a positive remedy with which to **increase** the secretion of **urine** in children. It gently stimulates the functional action of the organs, promotes normal secretion and relieves irritation. It is without doubt, our best remedy with which to restore the secretion in post **scarlatinal** or **post diphtheritic nephritis**. In these cases it may be alternated with positive doses of *belladonna*. In conjunction with a persistent application of heat, it will be found useful in **post puerperal** nephritis, of an acute character, and probably in other cases, where sudden suppression has resulted from profound sepsis.

Where we find colic with loose, slimy stools, it points to intestinal disorders, while convulsive movements are reflex symptoms, consequent upon the intestinal disease. These are benefited by this agent.

Santonine influences these conditions by stimulating the great sympathetic and giving tone to the functions of digestion and nutrition.

It has been employed with advantage in **nervous failure of sight**, nervous vomiting and nervous diarrhea; but it is doubtful whether it has ever improved the sight in amaurosis or cataract, as has been claimed.

Santonine causes yellow vision and yellow urine, Where worms are demonstrated to exist in the bowels, it is a common practice to give santonine with a cathartic of podophyllin, or follow it with castor oil. The agent is **toxic**, as stated, and should not be given in material doses for the special purpose of destroying worms, when the child is constipated or suffering from fever.

## **SPIGELIA.**

### ***Spigelia marilandica.***

Synonym—Maryland Pink.

#### **CONSTITUENTS—**

Spigeline (bitter principle), fixed oil, volatile oil, resin, wax, tannin, salts.

#### **PREPARATIONS—**

**Extractum Spigeliae Fluidum.** Fluid Extract of Spigelia. Dose, from one-half to two drams.

**Therapy—***Spigelia* is specific in the removal of intestinal worms. It need not be given in large doses, and if used with proper care, is most effectual. An excellent formula is the following, which contains united action of the two agents: Fluid extract of *spigelia*, two drams; santonine pulverized fifteen grains; simple elixir, a sufficient quantity to make two ounces. A teaspoonful is given on rising and retiring.

If this agent is followed, on the third day, by an efficient non-irritating laxative, it seldom fails to remove **lumbricoids**. The worms are not always entire when removed, but the evidences of their presence are gone, a slimy or heavy mucous discharge occurring from the action of the physic.

*Spigelia* is said to have a mild influence upon the heart. Webster says it is beneficial in endocarditis, especially in the rheumatic form, and that it will protect the heart from rheumatic attacks. It is stated that it is beneficial in angina, in all neuralgic heart affections, and in functional palpitations. The *Spigelia Anthelmintica* is thought to be more active in its influence upon the heart than the *Spigelia Marilandica*; otherwise there is but little difference in the two species.

## **CHENOPODIUM.**

## ***Chenopodium ambrosioides.***

Synonym—American Wormseed.

The oil of the herb and of the seed is the only preparation of *chenopodium* used. It is a thin, colorless, or slightly yellow liquid having a penetrating camphoraceous odor and a pungent, and somewhat bitter taste.

This is strictly an American product, large quantities of the oil being produced in this country though the foreign demand should establish foreign sources of supply.

**Therapy**—This agent has long been used as a remedy for **worms** but because of an early objection made to its use on the grounds of certain subtle, dangerous properties, it has not come into general use. In sufficient doses of from ten to twenty minims of this oil, it was recommended to expel the round worm. Our own authorities seldom recommended above five minims which was not always sufficient though safer.

A recent report puts this agent in its exact place as an anthelmintic. In the Orient, especially in Singapore and in Sumatra, the *oil of chenopodium* is extensively employed against **hookworm** and other intestinal parasites. More than 100,000 cases of hookworm of both the Old and New World types have been treated with practically no untoward effects, and with greater success than with any remedy heretofore employed.

In Sumatra, it is used also with equal confidence, in the treatment of **roundworm, tapeworm, and whipworm**. Weiss of Kisaran treated 5,000 cases of hookworm with highly satisfactory results. There was one case of nephritis which he thought might have followed it, but the case was quickly controlled. Schuffner and Baermann in Sumatra have treated over 40,000 cases without after effects, and with results superior to those obtained from thymol. They conclude that the efficiency of this remedy over thymol is as 91 to 83.

**Administration**—The method of the above observers is to give the patient a liquid diet for an evening meal, no breakfast on the following morning. From ten to sixteen minims of the oil is placed on sugar

divided into three parts, one part being taken every hour. Two hours after the last dose, a full dose of *castor oil* and a full dose of chloroform is given.

Others give ten minims as a single dose in a capsule, giving it every morning for three days, and on the third day, following it with a tablespoonful of *castor oil*. In the case of certain well known anthelmintics, oil must be avoided, but better results are obtained with this remedy in getting rid of the worm, after the paralyzing influence of chenopodium. Perhaps more care should be taken in our country to avoid such complications as nephritis and paralysis, but foreign prescribers account the remedy as harmless in the above described doses.

**Toxicity**—In addition to the conditions named above which may be induced are persistent inclination to sleep, great drowsiness, and depression. The agent, if these symptoms appear, should be withheld, and the patient stimulated with strong coffee or other available stimulant, and wakefulness induced, as after opium.

There is little doubt that this will now immediately become the most dependable of our remedies for hookworm, as well as being reliable for other intestinal parasites.

## **ASPIDIUM**

### ***Aspidium felix-mas.***

Synonym—Male Fern.

#### **CONSTITUENTS—**

Felicic, felixolic, felosmylic, tomaspidic and pteritannic acids, volatile oil, wax, chlorophyll, gallic acid, albumen, pectin, starch, gum, sugar, salts.

#### **PREPARATIONS—**

**Oleoresina Aspidii**, Oleoresin of Aspidium. Dose, from six to eight grains.

**Therapy**—A most active gastro-intestinal irritant, it is given to remove tapeworm, The oleoresin is given in doses of half a dram in capsules. One-half to one dram of the fluid extract may be given, or half an ounce of the leaves are steeped in half a pint of water and this is taken before

breakfast. Oils should not be given after this agent, as they facilitate the absorption of its toxic principle which exercises a profound influence upon the nervous system. Saline laxatives or vegetable laxatives may be administered. The usual preparation of the patient is essential and it is necessary to follow the removal of the worm with mild tonics and restoratives. Unlike those often used, this agent does not produce unpleasant results, being in every way a safe remedy if taken in proper doses.

It does not impair the appetite or reduce the strength.

## **CONVOLVULUS.                      *Convolvulus scammonia.***

Synonym—Scammony.

### **CONSTITUENTS—**

Resin (scammonin, identical with jalapin), gum, fibre, starch.

### **PREPARATIONS—**

**Regina Scammoniae**, Resin of Scammony. Dose, from three to eight grains.

**Therapy—***Scammony* is a **vermifuge** and is useful in combination with other vermifuges to increase their action. It also acts as a cathartic for their removal, as its cathartic influence is of considerable importance. It is hydragogue and irritating in large doses and more or less depressing. It has a certain eliminative influence, and like podophyllum, has been given in conjunction with alteratives. It is greatly superseded in this line of action, by many other of our agents better known.

## **MALLOTUS.                              *Mallotus philippinensis.***

Synonyms—Kamala, Kameela.

### **CONSTITUENTS—**

Resin 80 per cent, citric, oxalic and tannin acids, rottlerin, malotoxin, paraoxybenzoic acid.

### **PREPARATIONS—**

**Specific Kamala.** Dose, from thirty to sixty minims.



**Therapy**—Kamala is an efficient remedy for **tapeworm**, ranking next to *male fern*. No preparation for its administration is necessary. To counteract griping it should be taken in *cinnamon water* or combined with *hyoscyamus*. If the first does not act, it should be repeated in four hours or followed with a dose of *castor oil*.

*Kamala* may be employed as an external application in herpetic ring, worm, scabies and other skin diseases.

## **BRAYERA.**

## ***Brayera anthelmintica.***

Synonym—Kousso.

### **CONSTITUENTS—**

Brayerin (a bitter, acrid resin), volatile oil, tannin.

### **PREPARATIONS—**

**Extractum Kousso Fluidum**, Fluid Extracts of Kousso. Dose, from one to six drams.

**Therapy**—*Kousso* is given for the removal of the tapeworm. An infusion of half an ounce in a pint of water should be made and drunk on rising in the morning. The patient should take but little food during the day, and if the bowels do not move freely, a physic should be taken at night. An extractive is obtained from the plant, known as Koosin, which is given in doses of twenty grains. The fluid extract in two dram doses is also given. The agent is said to possess abortive properties. All intestinal irritants should be given with care in pregnancy.

## **GRANATUM.**

## ***Punica granatum.***

Synonym-Pomegranate.

### **CONSTITUENTS—**

Pelletierine, a colorless liquid, soluble in twenty parts of cold water, freely soluble in alcohol. Acted upon by sulphuric, hydrochloric, or hydrobromic acids, a crystalline salt is formed in each case. With tannic acid, the tannate of pelletierine is formed, a yellowish powder, odorless, pungent, astringent.

Dose of the **alkaloid**, from one-tenth to one-half grain.

Dose of the **salts of the alkaloid**, from one to five grains.

**Extractum Granatum Fluidum.** Fluid Extract of Granatum. Dose, from fifteen to thirty minims.

**Physiological Action**—*Pomegranate* has an astringent influence quite marked, at the same time in full doses it produces evacuation of the bowel, and in some cases irritation and emesis may be induced. A decoction of the fresh bark of the root will produce the best results, when the anthelmintic influence of the agent is desired.

**Therapy**—It is a specific for the destruction of the **tapeworm**. Two ounces of the fresh bark is macerated in two pints of water for twenty-four hours, when it is then boiled down to one pint. After fasting one day, the patient may take a wine-glass of this every hour, until the pint is taken. It may induce vomiting and purging, but if the bowels do not move freely, a physic should be given near the end of the treatment, or sometimes a glycerine enema will be sufficient. If not at first successful, the treatment should be repeated within a few days. When the fresh bark cannot be obtained, the alkaloid or its salts may be resorted to. This agent has been used in diarrhea and in **colliquative night sweats**. In **bronchorrhea** and as a gargle in various forms of **sort throat**, it has produced good results. It has been used both internally and as a douche in **leucorrhoea**.