

NUX VOMICA. STRYCHNIA. BRUCIA. THEBAIA.

THE three alkaloids, strychnia, brucia, and thebaia, appear to exert a similar action on the spinal cord, so that for convenience sake they are grouped together; but it must be stated that strychnia is more powerful than brucia, and brucia than thebaia. The remarks which follow apply mainly to nux vomica and its alkaloids, as thebaia has not yet been put to any therapeutic application.

It was formerly an occasional custom to blister the skin over paralyzed muscles, and to apply strychnia to the raw surface, with the hope of producing a greater effect on the diseased muscles than when the medicine is swallowed. This method, being superseded by the hypodermic injection, has now fallen into disuse.

Dr. Anstie recommends the hypodermic injection of strychnia in one-hundred and twentieth of a grain-doses to relieve the pain of cardialgia and gastrodynia, knowing, he says, "at present no such remedy for gastralgia as this."

Mr. Charles Hunter advises the injection of strychnia hypodermically, in cerebral, spinal, and other forms of paralysis. About one-eightieth to one-sixtieth of a grain administered twice or three times a week, will, he says, after three or four injections, almost always show if strychnia manifests any effect on that particular form of palsy. The injection produces a general warmth or glow of the skin, lasting a few hours, felt most in the paralysed limbs and down the spine; removes the sensation of heaviness or weight and the muscular twitchings, spasms, or cramps, of the paralysed parts, and may induce sweating, especially of the palsied parts. Most of these results I have myself witnessed.

Mr. Barwell employs strychnia hypodermically, in essential paralysis of children and eccentric paralysis of adults; in loss of motor power from pressure on a nerve; from debility after exhausting diseases, as diphtheria, scarlatina, or low fevers;

also in the latter stages of lead or gout paralysis. In opposition to the experience of Mr. Hunter, he cautions against the use of these injections in cerebral and spinal paralysis. Mr. Barwell injects from one-twentieth to one-twelfth of a grain, and employs a two per cent. solution, believing that of this solution a larger dose may be injected with safety, than a corresponding dose of a weaker solution. I have often injected the same relative dose of the pharmacopœia solution, without inducing any of the toxic effects of the drug. The injection should be made into the muscles every second day, or even daily.

Dr. Julian Chesolm employs hypodermic injections of strychnia in eye and ear diseases. He begins with one-fortieth of a grain, daily increasing the quantity till in fifteen to twenty days one-sixth or one-fifth of a grain is reached, and no benefit may take place till these larger doses are administered. As we meet with idiosyncrasies in respect of strychnia, it is well to begin with a small dose. These injections he employs in muscular asthenopia, amblyopia, tobacco amaurosis, and in progressive nerve atrophy not dependent on intra-cranial disease. Dr. Werner finds strychnia by injection useful in traumatic amaurosis. Perhaps these large doses given by the stomach might prove just as serviceable.

The preparations of nux vomica have an intensely bitter taste, and, like other bitters, augment the flow of saliva.

They produce a sensation of hunger, but there is no evidence that strychnia or any other bitter substance increases the digestive power in a healthy person. Like other bitters, and perhaps more efficaciously, these preparations, by their slight irritant action, obviate departures from health of the gastric mucous membrane, and under such circumstances promote digestion. Their action, and especially that of the tincture of nux vomica, for this purpose far the best and most agreeable, is well shown in certain perverted conditions of the digestive canal. For example, in the course of chronic diseases, as bronchitis or dilated heart, or cirrhosis of the liver, the tongue not unfrequently becomes thickly coated

with a white fur, and the state of the digestion indicates chronic catarrh of the stomach. One or two drops of the tincture of nux vomica in a teaspoonful of water, every two hours or oftener, for twenty-four to forty-eight hours, will often clean the tongue, improve the digestion, and clear the way for the administration of nourishment at a critical time. Again, during early convalescence, when the tongue still continues coated, and the digestion weak, nux vomica will improve the condition of the digestive organs, and prepare the way for stronger tonics and more liberal diet.

This treatment greatly mitigates the annoying flatulence and indigestion occurring in cases of mechanical obstruction of the circulation in the digestive organs, as from cirrhosis and dilated heart; indeed, nux vomica is more or less serviceable in flatulency of any kind. Heartburn, too, frequently yields to small quantities of the tincture given three or four times a day.

Nux vomica is of great service in a group of symptoms, including weight at the pit of the stomach after food, acidity and heartburn, flatulence, accompanied by heat and weight at the top of the head, the last symptom occurring usually in women, especially about middle age. This dyspeptic condition is often benefited by five drops of the tincture of nux vomica taken about a quarter of an hour before food three times a day. The heat and sensation of weight on the top of the head, even when occurring independently of any gastric disturbance often yields to the same treatment.

In acute gastric catarrh, accompanied by "sick headache," the action of tincture of nux vomica is often very conspicuous. This common and troublesome complaint is sometimes traceable to error in diet, or constipation, but it occurs often without any apparent cause. Headache is often the most prominent symptom, the nausea being very slight, amounting only to mere qualms. A drop of the tincture in a teaspoonful of water, taken every five or ten minutes, to the extent of eight to ten doses, and then continued at longer intervals, often quickly mitigates this kind of headache, and

in a few hours removes it, when otherwise it would continue severe all the day.

The tincture or extract of nux vomica has long been employed to obviate constipation, habitual or temporary. The extract, variously mixed with other remedies, as rhubarb or colocynth pill, should be taken daily, a little time before dinner, both to aid digestion and the proper unloading of the bowels. Or the same effect is often obtainable by giving one or two drops of the tincture twice or three times a day; this small quantity often proving amply sufficient to ensure daily one comfortable motion. In our lack of knowledge of the exact circumstances indicating its employment in cases of constipation, it seems to be capricious in its action, and it is as well, therefore, not to be too sanguine of its success; for in some cases it answers beyond all expectation, while in other apparently similar cases it fails as completely. If the sluggishness of the bowels has persisted a long time, and is very obstinate, the patient should take occasionally, early in the morning, half a tumblerful of some natural purgative water to assist the nux vomica. Should the tardy action of the bowels be due to insufficient supply of bile, the motions being pale in colour, nux vomica will fail, and other more appropriate medicines are required.

Strychnia, as Mr. Savory has shown, is much more poisonous when injected into the rectum than when swallowed, a curious difference not owing to the digestion and destruction of the alkaloid by the gastric juice, as Mr. Savory has proved that this secretion exerts very little, and probably no effect, upon strychnia.

Strychnia and the other active principles of nux vomica quickly enter the blood, as is shown by the rapidity with which a poisonous dose is followed by characteristic symptoms. Moreover, the alkaloid can be extracted from the blood and urine, a conclusive proof of its absorption.

A large and poisonous dose produces symptoms very closely resembling those of tetanus. The first symptoms are general uneasiness, with restlessness and soreness of the

limbs. Shooting pains like electric shocks occur in various parts of the body, often first in the back, and down the arms and legs. Tetanic and paroxysmal contractions of the muscles soon set in, which rapidly grow worse, make the body rigid while the paroxysm lasts, and completely arrest the respiratory movements, so that the face becomes bloated and livid, the jugular veins stand out in the neck, the eyes are staring and prominent, the jaws firmly clenched, and the pupils dilated. Each spasmodic attack lasts from a few seconds to a minute or more, and then generally ceases altogether for a time. Throughout the paroxysms, the mind is quite unaffected, and the patient's sufferings are agonizing. A breath of air, a slight noise, movement of the bed-clothes, the most trivial cause, will excite tetanic spasms. In a fatal case death is rapid; and if the patient survive two or three hours, sanguine hopes of his recovery may be entertained. A fatal termination may be due either to exhaustion from the repeated convulsions, or to asphyxia from spasms of the muscles of the chest.

Brucia, thebaia, and most of the opium alkaloids affect the body in the same way.

The symptoms of strychnia poisoning differ from those of tetanus in the following particulars:—From the first they are very strongly marked, and rapidly reach their worst, perfect intermissions occur, and death soon takes place, or the symptoms rapidly decline, and the patient recovers.

Treatment of poisoning.—*Stomach pump*, when it is available in time, for after tetanic symptoms have set in, the introduction of the stomach tube would excite a paroxysm. *Animal charcoal*. Tannin solution of iodine. *Chloroform inhalation*. Injection of curare or of methyl and ethyl compound of strychnia, of brucia, or of thebaia. Artificial respiration. Fats.

Leube and Rosenthal find that pulmonary insufflation arrests strychnia tetanus by increasing, as he supposes, the absorption of oxygen. Brown-Séguard confirms these statements concerning insufflation, but contends that the arrest of

convulsions is due to the mechanical effect produced by the air forcibly impinging upon the ramifications of the vagus, of the bronchi, and of the nerves of the diaphragm, and exciting a reflex inhibitory action; for section of the cord above or below the origin of the phrenic nerves and section of the vagi prevent the action of insufflation.

Strychnia excites tetanus, not through the brain; for in poisoning by strychnia the mind, to the last, remains unaffected, and between the paroxysms animals can execute voluntary movements. Nor does it tetanize through the muscles or nerves; for after division of one sciatic nerve, strychnia excites tetanus in every part of the body except in the limb supplied by the divided nerve; yet as the vessels of this limb are undivided, its unconvulsed muscles and nerves are as much poisoned by strychnia as those parts which are convulsed. As strychnia tetanizes neither through the brain muscles nor nerves, it must act through the cord. Since tetanus depresses the functional activity of the motor nerves and muscles of a tetanized limb, the one conveying and the other responding imperfectly to stimuli, it would seem that strychnia paralyzes these parts in some degree; a surmise apparently strengthened by the fact that the tetanized muscles quickly become stiff from rigor mortis. Kölliker, however, has shown that tetanus depresses the functions of the motor nerves and muscles through the excessive activity they have been made to undergo. On division of the sciatic nerve, Kölliker found that the posterior limb was not convulsed, and that the motor nerves of this limb retained perfectly their power to conduct impressions, and the muscles to contract on stimulation. Kölliker is of opinion that the afferent nerves are unaffected by strychnia.

Harley's experiments show that the poison acts on all parts of the spinal cord. Its effect on this organ appears to be twofold. It dilates the vessels, and thus increasing the supply of blood, augments the activity of the functions of the cord. But apart from this property of dilating the vessels, it is supposed that strychnia exerts a direct stimulating influence on

the spinal cord, although, as Harley has shown, it can act only through the blood, and does not, as was formerly supposed, exalt the functions of the cord when divested of all its vessels, and when a solution of strychnia is brought into direct contact with its elements.

It is stated that traumatic and strychnic tetanus produces minute ecchymoses in the cord; but this is not the case with tetanus excited in frogs by strychnia; for these animals may be tetanized for weeks without the production of ecchymoses,—a fact proving that they are the result, and not the cause, of the tetanic spasms.

Kölliker asserts that strychnia affects but little the blood of frogs.

Nux vomica or its alkaloid is commonly employed, often with great benefit, in motor paralysis. It is sometimes administered with the view of exciting slight twitchings in the paralysed muscles, so as to keep a sort of artificial exercise to maintain their nutrition, and prevent their wasting; but if strychnia benefited in this way, surely galvanism would effect this object better. Dr. Brown-Séquard recommends *nux vomica* or strychnia in those forms of paraplegia dependent on softening and wasting of the cord, as when the supply of blood conveyed to it is diminished through degeneration and partial blocking-up of the vessels. Strychnia is supposed to dilate the vessels, and to increase the supply of blood in the degenerated tissues, and thus avert their further destruction.

Strychnia sooner affects paralyzed than unparalyzed muscles.

Strychnia in medical doses is said to strengthen the beating of the heart. It has been shown that the heart of an animal poisoned with strychnia ceases to contract sooner after death than that of an animal destroyed by mechanical means; and further, that if a frog's heart is placed in a solution of strychnia, it ceases to beat sooner than another placed in simple water. It is not said whether this organ ceases to contract in the systole or diastole. Harley states that if a

solution of strychnine is dropped on a heart, its muscles become tetanic. The same authority says that both strychnia and brucia lessen the absorption of oxygen, and the production of carbonic acid; in other words, they lessen the respiratory function of the blood. Thus, if either of these alkaloids is mixed with blood recently drawn, the amount of oxygen it absorbs, and of carbonic acid it gives off, is less than with simple blood. Is it not probable that any substance capable of altering the physical or chemical condition of the blood will lessen its respiratory function?

Strychnia given to rabbits with young, causes them to abort; whence it has been concluded that it possesses a direct influence on the uterus, but there is no evidence to confirm this conjecture.

Strychnia is useful in prolapsus ani. If the prolapsus is associated with constipation, the *nux* may be added to a purgative, as tincture of rhubarb. In case of diarrhoea this should be checked, when the prolapsus will probably cease; but if not, strychnia will generally succeed quickly in curing a child of this troublesome complaint.

These preparations, and especially the tincture, are often of much use in the so-called hysteria met with in middle-aged people. It appears in many cases to control the distressing flatulence commonly connected with this state, and to relieve the sensation of heat and weight on the top of the head, and it often removes effectually, although less surely, the flushings of the face and hot and cold perspirations. It is still more effectual when combined with small quantities of *laudanum*.

Dr. Anstie has noticed that strychnia sometimes produces symptoms closely resembling intoxication, this peculiar effect manifesting itself in unsteadiness of gait, perversion of the intellect, and a meaningless smile. On one occasion the author was able to connect a peculiar wandering delirium at night with the employment of strychnia. In this case there were no tetanic twitchings.

According to Dr. Anstie strychnia promotes capillary cir-

ulation; hence he recommends it in troublesome coldness of the hands and feet.

Strychnia sometimes induces persistent erections, which phenomenon has led some medical men to give it in impotency and spermatorrhœa.

Large doses of strychnia, are sometimes useful in spermatorrhœa, especially when associated with impotence.

Strychnia is sometimes employed with much benefit in paralysis of the bladder in old people whose water constantly dribbles away. It may be useful in the incontinence of urine of children.

Strychnia is separated in part, at least, by the kidneys. Its influence, if any, on the urine has not yet been ascertained.

Drs. Crum Brown and Fraser, in a remarkably able paper, have recently published some experiments made with methyl and ethyl compounds of strychnia, brucia, and thebaia, and have arrived at some astonishing results. While retaining most of their chemical properties, giving the ordinary reactions of strychnia, brucia, and thebaia, yet the physiological action of these substances on the body is completely altered. These observers experimented with iodide of methyl-strychnium, sulphate of methyl-strychnium, and with the nitrate and hydrochlorate of the same base; likewise with iodide and sulphate of methyl-brucium, and with iodide and sulphate of methyl-thebium.

Strychnia, brucia, and thebaia, as we have already stated, affect the cord, and produce, according to the dose, more or less severe tetanic convulsion. But these substances, when converted into the ethyl and methyl compounds, cease to act in this manner, but produce general paralysis of the body, an effect shown by these experimenters to depend on paralysis of the ends of the motor nerves; that, in fact, these new compounds act on the body in the same way as curare.

In their action on the heart and muscles, these new substances were likewise found to differ much from strychnia, brucia, etc.; for, after poisoning by the methyl or ethyl

compounds, the heart continued to contract naturally for a long time, while the muscles for many hours continued flaccid, contractile, and alkaline.

These observers further experimented on codeia, morphia, and nicotia. At the conclusion of their treatise they say—“The change in the character of the physiological action is remarkably illustrated by strychnia, brucia, and thebaia, whose purely spinal stimulant action is converted into a paralyzing action on the periphery (end organs) of motor nerves; it is apparent in codeia and morphia, whose convulsant action is also converted into a paralyzing action on motor nerve-end organs, and whose hypnotic action is apparently altogether destroyed in the case of codeia, and certainly greatly diminished in that of morphia; and it is obvious, though less so than with the others, in the case of nicotia, whose convulsant action is diminished, if not altogether removed. We may conclude from these facts that when a nitrile base possesses a strychnia-like action, the salts of the corresponding ammonium bases have an action identical with that of curare.

“It is well known that curare and strychnia are derived from plants belonging to the same genus, and it is therefore interesting to observe such a relationship. It may not, however, be altogether superfluous to add that strychnia, brucia, and the other spinal stimulant alkaloids examined in this paper, have not been converted by chemical addition into curarina—the active principle of curare. The action of the methyl derivatives of these bases is of precisely the same character as that of curare, and they possess the same peculiarity of slow absorption by the mucous membrane of the digestive system, but the degrees of their activity are very different. If we confine our attention to the salts of the methyl derivatives of strychnia, brucia and thebaia, where the action is uncomplicated, we observe they form a series in which the fatal dose varies for each, while this dose, in the case of the most active of the three, is considerably above that of curare, and greatly above that of curarina. Besides, curarina has a characteristic colour reaction that belongs to

none of these bodies, and the latter further prove this dissimilarity by each of them possessing special colour reactions, by which they may be distinguished from each other."

LOBELIA INFLATA.

THIS remedy has been both highly extolled and as strongly condemned; for with some it has answered beyond expectation, but to others it has yielded nothing but failure and disappointment. This discrepancy of evidence may be reconciled; for it will be found that the medicine has been given in very different doses by the two differing sets of authorities. Unless given in large doses—doses considered by many, without any foundation, as poisonous—this remedy is inoperative. Many erroneously think that lobelia is a highly poisonous and dangerous drug, to be given with much caution and close watching.

Lobelia is of great service in many cases of asthma, whether dependent or not on visible structural changes in the lung. It is useful in the peptic and especially in the bronchitic form. These two forms are generally more or less mixed, the tightness of breathing in bronchitic asthma being increased by food, and the peptic asthma leading after a time to emphysema and bronchitis. Lobelia is less useful I think where the attacks come on periodically, at intervals varying from about three weeks to a month. It may indeed postpone or partly suppress the paroxysm for several days, but after a time it usually breaks out, the lobelia being apparently unable to prevent the attack. My experience leads me to esteem lobelia higher the more I try it. I frequently hear patients extol it though it must be confessed that in some cases it fails entirely. In the bronchitic form patients often say it "helps them to get up the phlegm." It is hardly necessary to observe that lobelia is not useful in all forms of dyspnoea; for instance,

it is useless when this depends on heart disease, and when the difficulty of breathing comes on only from exertion, or from a bad fit of coughing. This medicine being only remedial, and not curative of the conditions causing the dyspnoea, it should be given only during a paroxysm. On any signs of an oncoming fit the medicine must be taken immediately, in doses of a drachm of the simple tincture every hour, or even every half hour, or ten drops may be taken every ten minutes or quarter of an hour, till the dyspnoea gives way. It is better to adopt the smaller and more frequent dose, as, should sickness or depression occur, the medicine should be discontinued. The great drawback is its uncertain action, some patients being made sick and faint by doses which others take without any such effect. The risk of depression is obviated by small frequent doses, and a patient soon learns the suitable dose and periods necessary in his case. It is well to inform patients of the possible occurrence of sickness and faintness, which may make them feel very ill; but these symptoms soon disappear, and never, so far as the author has seen, become serious or dangerous. Thus he has repeatedly given two drachm doses without any dangerous consequences; but this large dose generally excites a sensation of sinking at the stomach, with nausea, and not unfrequently vomiting. Where the patient complains of more or less constant tightness of the chest with frequent exacerbations during the day, he should take ten minims of the tincture thrice daily, with an additional dose on the occurrence of the exacerbation. In bronchitic asthma where the breathing is a little tight all day but much worse at night, the patient should take ten minims, three times a day with additional doses, according to the state of the breathing at night. It should be given with caution to asthmatics with heart disease, or it may render the pulse irregular and very weak. Lobelia inflata allays the dyspnoea which accompanies capillary bronchitis in emphysema.

In certain epidemics of whooping cough lobelia is very serviceable, whilst in some epidemic forms it seems useless. Lobelia is useful in the spasmodic stage, and generally, in

two or three days, reduces by one half the frequency of the attacks, lessening at the same time their severity. The speedy subsidence and disappearance of the whoop attest the influence of this drug. Like all other remedies for whooping cough, it acts best in uncomplicated cases, and when the weather is warm and mild. If the weather is cold, and the winds cutting and sharp, the child should be confined to a warm room; but under other circumstances the child should live as much as possible in the open air. For a child two years old, the author orders ten minims of the tincture of lobelia every hour, and an additional dose each time the cough is imminent, if it gives sufficient warning. Children bear large doses of the drug; for, in no instance, has the author witnessed nausea, sickness, or faintness, or any ill effects, follow the doses just recommended. He finds, indeed, that adults are much less tolerant of lobelia than children.* Sometimes, it is true, this medicine produces a slight burning sensation in the throat. Whooping cough is well known to be a very obstinate and dangerous affection in children only a few months old, and in such cases lobelia often appears to do less good than in older children. The author gives five minims of the tincture every hour even to very young children.

Lobelia has been praised in bronchitis; the author has tried it in several cases; but while it removed any paroxysmal dyspnoea, it appeared to be powerless over the bronchitis itself. It has been employed in laryngismus stridulus and in croup.

* Mr. Foster of Huntingdon, and Dr. Howard Sargent of Boston, America, recommend clover in whooping cough. Dr. Sargent gives a wineglassful occasionally through the day, of an infusion made with two ounces of carefully dried blossoms of red clover, steeped in a pint of boiling water for four hours.

CANNABIS INDICA.

ALL persons are not similarly affected by Indian hemp, and race and climate have been supposed to modify its influence. Its effects are most marked on the brain, whose functions it more or less perverts in various ways. It generally produces a pleasurable intoxication, and the dosed person becomes talkative, or sings, or perpetually giggles, and objects often assume to him very grotesque aspects, exciting him to much merriment. He is possessed with a feeling of happiness and contentment, and ideas of a pleasing kind pass with much rapidity through the mind, sometimes unconnected and immediately forgotten; but in other instances remembered on the return to the normal state. After a time sleep sets in, generally accompanied with delightful dreams. There may be pain in the head, and "a sensation as of the brain boiling over, and lifting the cranial arch like the lid of a tea-kettle." Among the early symptoms are a feeling of heaviness of the arms and legs. The head feels hot and heavy. The eyes are bright and shiny, with sometimes giddiness and noises in the ears. General sensibility is also affected, and pricking in the feet, or over the whole body with numbness, often of a pleasurable kind, is an early symptom. Pressure on the skin may excite a sensation of burning. After a time, complete anæsthesia sets in to such an extent, that while standing there may be no consciousness of touching the ground. The muscular sense is even lost, and pain is lessened or removed. Sometimes it produces complete catalepsy. It often occasions a ravenous sensation, not to be appeased by food. In some instances the pulse is said to be at first rather increased in frequency and strength, but neither pulse nor breathing is much altered. The pupils contract to light. Sometimes there is strong sexual desire.

Such is the group of symptoms induced by Indian hemp, but they do not all occur in the same person, but are variously combined; and sometimes it produces sensations anything