Some clinical considerations of the actions of Nux vomica and other emetics.

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Some Clinical Considerations of the actions of Specacuama, and other Emetics.

There is nothing in the economy of human nature more wonderful than the exquisite nicety with which terminal nerve filaments are enabled to discriminate or distinguish various sensations. The nerves of sight and taste discover different tints and flavours in almost every substance in nature, and it is quite consistent with, and analogous to, these facts, that irritating substances of neither taste nor smell should excite the body nerves of the body in many cases, and it is also natural to suppose that the actions which are brought about in consequence of these irritations should likewise vary.

In the case now under consideration, viz., the effect of the action of certain substances, which irritating the nerve endings in the stomach wall, bring about the condition of vomiting, although the actions differ in some respects yet they have probably all one common object, that is, to throw off the irritating substance.
and relieve the body of its presence.

Nausea is a sensation peculiar to the stomach. It has nothing akin to pain, and is so different from it that it might almost be called a special sense. The stomach is however susceptible of pain when inflamed or injured, but under such conditions it does not necessarily suffer the sensations of nausea. The sensations of pain and nausea are entirely distinct, and are probably conveyed by distinct nerve fibres.

Nausea is produced by substances which, in doses just sufficient to produce vomiting, have no power to injure the stomach either chemically or mechanically. It is an impression felt by the nerves of the stomach, as flavours and tastes are perceived by the nose and tongue.

As the stomach is susceptible of these two sensations, so different from each other, it would be interesting to know precisely the method of transmission of each.

No satisfactory explanation can be given of this sensation of nausea. There must be some reason, definite enough, why the stomach is made susceptible of it. All enterics must possess some common quality by which they excite it, and clinically speaking, it can hardly be doubted that the sensation of nausea, and the power of vomiting, are given to the stomach for the beneficial purpose of throwing out of the body such substances as would prove detrimental to it if they
remained in it. As further evidence of this, if any emetic substance be administered in repeated doses, each so small as not to excite vomiting, it will usually occasion purging; as for instance, Copper Sulfate, which though generally in small doses astringent in Emetic doses, if it fail to produce emesis, will act as a violent and irritant purgative; Tarloremetic has a similar action; andSpecacanaba, though not an irritant purgative under such circumstances, nevertheless produces copious and characteristic 'Specacannah stools.'

Further, if the emetic substance be absorbed into the blood, it acts either as a sudorific, elucrete or expectorant.

There seems then good reason for stating that the body mechanism rebel against certain emetic substances, for as long as they remain in the body they excite general uneasiness and considerable excretions or evacuations. They do not usually produce one evacuation but many, when in the stomach they excite vomiting, when in the intestines purging, when in the blood sweating, increase of urine, of bile, of pulmonary secretions. In short wherever they get into the body, every effort is made to throw them out.

The various clinical symptoms then which take place in vomiting are explained in the following manner. Emetics are substances noxious to the human body, and nausea is a disagreeable sensation produced by contact
Of these substances with the walls of the stomach, the violent muscular contractions which are brought about when an emetic is swallowed, are an effort of the body to expel it. The effect also of many of these substances when absorbed, is to act as irritants, to produce by direct stimulation or irritation of the liver cells, a cathartic action, to increase the activity of the kidneys (as in the case of Squills) and also the intestinal, salivary, bronchial and lacrimal glands; probably also other secretory glands, for the purpose of expelling the offending substance from the body.

The general effect of an emetic in large doses is to bring on a condition of acute depression and nausea, a condition of activity of the vaso-dilator nerves of the cutaneous blood vessels, with a resulting cold clammy perspiration, similar to that which occurs in the condition of Collapse, if the substance, taken in large doses, were not rapidly expelled from the body by every possible means, the effects might be even further reaching with syncope and death, fortunately they are their own antidote.

This depression induced by the emetic substance, together with the violent exertions in vomiting, is accompanied by a lowering of the circulation and an absentmindedness of the pulse, and after the while tumult is over a considerable degree of debility and languor results is left, partly proceeding from the evacuations, secretions, secretions that have been violently taking place, partly from the depression.
It is not only substances that excite disgust that prompt the body mechanism to act in such a manner as is calculated to rid it of their presence, but some substances that are not of themselves noxious and not unwholesome may prove emetic in action. Warm water frequently has this effect, through externally applied of a soothing nature. Even a stomach overdistended with food, as in infants, is frequently sufficient to induce vomiting, though this does not necessarily cause vomiting or nausea 'per se', and may do so also merely as the result of chemical production of noxious products of excessive fermentation within the stomach.

Object human associations have an effect similar to that of an absorbed emetic substance, such for instance as disgusting sights, bad smells, even sometimes mental impressions affecting reflexly the vomiting centre, and passing along the efferent nerves - chief of which are the vagi and phrenic - producing vomiting and even diarrhea.

When a moderate but sufficient dose of Specranthus is swallowed, after the nauseous taste has passed away, the stomach remains for some time undisturbed, but within twenty minutes to half an hour, an uneasy sensation and nausea come on, the feeling of sickness increases, often pain is felt in the head, probably from induction of an anaesthetic state of the brain, shivering, amounting to rigor, frequently occurs, the pulse becomes
feebly, the face and lips pale, and the countenance depressed, the muscles become placid and lose their power from depression of the motor centres, a cold perspiration almost identical with that accompanying collapse sets in, and vomiting ensues.

During the act of vomiting the blood pressure is increased, there is great straining, and agitation of the whole body, and there may be much pain in the stomach. The face and eyes now become flushed, and all the veins appear turgid with blood, perspiration becomes profuse, and for a time the pulse feels to be of much greater strength and fullness.

Emetics influence sympathetically the whole system, and these sympathetic effects are especially noticeable in the administration of doses not quite sufficient to induce emesis. This effect is of use in commencing inflammation, and for the purpose of allaying spasm, as in attacks of pneumo-pneumonia, and in the doses of cutting short fevers and other diseases at their onset.

After the Specacuamba emetic has had its effect, the vomiting presently ceases, there may be a few fits of retching for a time, the violent symptoms pass away, leaving the patient in a languid condition and feeling still the effects of nausea. After short intervals there may occur two or more attacks of retching with similar symptoms. The vomiting
Cases at last, but nausea may persist for some time. The pulse is now weak and low, and the patient exhausted and anxious.

Eucalytes seldom exert any sensation in the stomach for some time after they have been swallowed. This may be due to the protecting influence of the mucus on the internal surface of the stomach, preventing the substance from coming into actual contact with the peripheral nerves, or absorbers.

Locally, eucalytes operate probably by stimulating or irritating the nerve endings in the stomach, which irritation is conveyed to the centre in the spine, generation of motor impulse is produced, and consequent action of nervous and muscular tissues involved in the act of vomiting.

According to Lanier Brunton — Materia Medica, 3rd Edit. 274 — section of the vagi usually, but not always, destroys the power to vomit, because it destroys the coordination of muscles producing the act of vomiting, they no longer act simultaneously.

The vomiting centre is usually under -sided to be situated near the respiratory centre in the medulla, and vomiting may be, and is frequently, induced by the absorption of substances into the blood stream, and by direct stimulation of the centre.

In other cases of vomiting the effect is produced directly by action on the stomach nerve endings, the afferent impulse being conveyed by the vagus, sympathetic, and glossopharyngeal nerves, and the efferent-
mainly by the phrenic and vagus. The vagus, containing both afferent and efferent fibres being the one chiefly affected.

Some emetics act only when locally applied to the stomach, as warm water and mustard, and do not excite vomiting when introduced directly into the blood. They act directly by stimulating the gastric nerves, and this peripheral irritation is transferred by afferent nerve fibres to the centre in the medulla, or by transference to the spinal centre, and muscular contractions of the stomach and abdominal wall is set up.

Others, no matter how introduced into the blood system, act as irritants, and produce vomiting, not only when locally applied, but also when absorbed or injected into the blood. Of this class especially are Speciaenanda and Antimony.

That Speciaenanda is a substance irritating to the tissues is shown by its action when applied to the skin, after the application of a paralysing, purulent lesion being raised.

By its irritating effect on the mucous lining of the respiratory tract when inhaled,

and Frankel (Zeitschrift Encyclopaedia. Vol IV p. 120) has observed persons "who cannot step into a room containing powdered Speciaenanda without getting a cold in the head". And I have been acquainted with a case where the presence of a Dover's powder in a room brought on a severe attack of asthma.

Ringer (Handbook of Therapeutics, art. Speciaenanda)
states also that *Sennauxana* thus excites symptoms and appearances similar to those met with in hay fever, that is, it excites a catarrhal inflammation in the mucous membrane of the air passages.

Further, it has been observed in the administration of *Sennauxana*, that if it fails to produce vomiting in large doses, absorption of the drug takes place, and severe remote symptoms occur, even to pneumonia.

After this general survey of the effects of *Sennauxana* and other emetic substances from a clinical standpoint, we shall proceed to take notice of some of their uses.

Their most obvious use is to empty the stomach when too full, or when its contents are likely to act adversely to the well being of the body generally. They are also useful on entirely different occasions when the stomach may be empty, for the production of more remote effects, or account of the power they possess of exciting other evacuations or secretions, and of lowering arterial tension.

In inflammatory forms of fever, where the pulse is hard and strong and of high tension, with a dry hot skin, an emetic is often of the greatest service, even if the dose be insufficient to bring about the emetic effect, the result generally is to lessen the vascular tension and the severity of the fever, by favouring perspiration and reducing blood pressure in various ways.
Specerchuha has been given in emetic doses, and also in smaller but nauseating doses frequently repeated, in apparently irreducible hernias with very decided and beneficial effect in relaxing the tension, and enabling the bowel to be returned with ease. I have adopted this method of dealing with hernias in hospital practice on many occasions, and where there is any chance at all of returning the gut it is of the greatest value, and frequently leads to a successful result when hot baths have failed.

In place of administering opium in such cases for the purpose of relaxing the tension and relieving pain, and so enabling free manipulation, I am in the habit of using Dulc. Peronici in somewhat large doses, 15 to 30 grs.

The act of vomitting not only empties the stomach and duodenum, but also the gall bladder and hepatic ducts. After these viscera are emptied their various secretions go on again with rapidity. This may then occasion diminution of secretion elsewhere, and whilst the act of vomitting may clear their contents from out of the stomach, gall bladder and duodenum, the emetic substance itself will probably also be entirely vomited. But as in the act of vomitting the Breechial tubes may be cleared of their mucous contents in, say, acute Breechialitis, this increase in secretion elsewhere will tend to diminish that from the bronchi, and so to relieve the irritation and cough for some length of time, if
free sweating and urination are also induced. The relief will be all the more con-
siderable on account of the resolution of action which takes place.

For this reason an Ipicaeausta emetic is most useful in cases of Acute Bronchitis, where present of
low in the muscular tissue of the bronchi, and tenacity of the mucus secretion, this secretion
cannot be expelled from the bronchi, or only with difficulty.

In Haemoptysis, emetics have been suggested as remedies worth the trial, and
highly recommended, especially by Gravez, Trouseau and A Weber. Any beneficial effect
that may be brought about by vomiting, and the coincident nausea, in relieving haemorrhage
from the lungs, may be due to diminution of vascular tension and the depressing effect on
the circulation, and to the clearing out of the bronchi of any blood that may be contained
there. During the initial stage of the action of the emetic, and when vomiting and
reaching are taking place, the rapidity and force of the circulation are increased considerably,
and further, the inspirations are usually more forcible and deeper, conditions which
probably will not lead to diminution the bleeding, but may by inducing more
vigorous muscular action. Set-up fresh
haemorrhages, it is not such a method
of dealing with haemoptysis as has met with
wide practice, and may be cleaned with a
possible method of checking haemorrhage as suggested by Ribbroth (surgical pathology) as an interesting one, viz,—by bleeding, or allowing the haemorrhage to continue until the blood pressure become so low, and the heart's beat so imperceptible, as to automatically terminate the haemorrhage.

In Haemophilia, Specenacian powder in nauseating doses has been given, and followed by a temporary amelioration of the tendency to congestions, but it is at most only palliative, and since these bleedings are commonly preceded by symptoms of plethora and congestion and probably result from engorgement of vessels, it is probable that checking the haemorrhage prematurely may do harm.

(Immermann - Séances Ency. Vol. xvi. p. 97.)

I have only had experience of this method of treating haemorrhage from a person afflicted with Haemophilia on one occasion, and the result was nearly fatal.

Almost every substance taken in certain quantity will excite vomiting. Almost all purgatives are emetics in large doses, and every practitioner meets with cases in which the patient finds it difficult or impossible to keep certain purgatives on his stomach. On the other hand most emetics are certain or repeated doses will act as purgatives. This tends to show that they act on the body in much the same manner though in different doses, and that the distinction in some senses is an arbitrary one.

It is not uncommon in the
Administration of a purgative, to add a small quantity of an emetic substance in order to quicken and increase the action of the purgative, but we never reverse this and add to an emetic a purgative substance in order to increase the action of the emetic. This may be done more effectively by increasing the quantity of the emetic itself.

Probably the two drugs most used as emetics are Spermacoë and Suralut. Emetic, of these Spermacoë is the mildest in its action and excites the least depression. This is not solely due to a difference in the dose, for the dose may be increased to three times that needed to produce vomiting, and yet it still operates mildly, whereas Suralut emetic even when given in doses just sufficient to excite vomiting, operates more severely. It not only excites much more violent action of the stomach, but it also operates generally much more severely as a purgative or sudorific or both, probably because the whole amount taken into the stomach has not been thrown up by the act of vomiting.

It would naturally happen that part of a dissolved or soluble salt will be more likely to escape the action of the stomach in vomiting than part of an undissolved powder, and consequently to continue to act for a longer time.

Powdered Spermacoë will be more easily expected by the action of the stomach because it cannot so unitarily diffuse itself as a dissolved salt. This is
probably the reason that powdered Specocuamba is a much more manageable emetic than the
Wine or Tincture. That is to say, it is less difficult for the stomach to reject powdered
Specocuamba than tincture, or even Larlar emetic in solution, and it also explains
why a much larger dose had to be given. Specocuamba than is necessary to excite vomiting, does not
bring about more serious symptoms, because
as soon as sufficient has come into actual
contact with the walls of the stomach to
cause contraction the whole is expected.
Larlar emetic cannot in any case
be made to excite sweating and purging without
vomiting with as much success as Pulvis
Antimonicialis, for the reason that the powder
being given as a powder does not induce so
violent an action at one time, some nausea
is felt, but not sufficient to cause vomiting,
and the powder passes on into the bowel and
sweating and purging result.

The action of Specocuamba in Dysentery
probably depends on the passage of the substance
from the stomach into the duodenum, and on
its absorption, and stimulating effect on the
Bile secretion, in fact to its well known cholagogue
action, as well as to its irritative or stimulating
effect on the dysenteric portions of bowel locally.
But it is more probable that the great
increase of the antiseptic bile and intestinal
secretions, due to the cholagogue and other
actions of Specocuamba is the main factor
in its remedial action in dysentery,
Some years ago I suffered severely from dysentery in India for four days before being able to get a supply of Specacuanae powder, and lost two stones in weight in the time. After the second dose — the first was vomiting after having been down ten minutes, a dose of 30 g– for a time considerable nausea was experienced, this passed off, and then followed somewhat severe purgation of copious bilious looking stools, but without any gripping or straining. There was more in the one stool than in the score or more of painful mucous straining and evacuations of the previous twenty-four hours. A third dose on the succeeding day was followed by a similar effect and recovery was prompt and rapid.

It is therefore of the first importance to establish tolerance of large doses by the stomach as soon as possible, and the plan I frequently adopted in tropical regions at that time, when any difficulty arose in obtaining this tolerance, was to administer a small dose of Cocaine, in order to deaden the sensitiveness of the stomach, and after the lapse of a few minutes to allow of this effect to take place, to follow it with a large dose of pure Specacuanae, which was almost invariably retained.

When Specacuanae injected in large quantities per os down through a long tube, had not, so far as my experience went, so marked an effect in relieving the condition, but on one or two occasions, after some time had elapsed, and considerable absorption
had probably taken place, Specacuamba stools were produced, and usually also nausea and vomiting. There appeared to be no advantage in this method of administration, but the contrary, as it did not relieve to any permanent extent the condition for which it was given, but depressed still more the patient. The only real benefit was derived when large doses of Specacuamba powder administered by the stomach brought about large and characteristic 'Specacuamba stools'.

There have been observed many cases in which Specacuamba could not be borne at all. I have met with several patients in whom doses of 2-3 minims administered as expectorant (of the sinuses), produced violent emetic and other characteristic symptoms, but when I have had such apparent cases to deal with in which I desired to administer large doses, I have as before mentioned given it after rendering the sensitiveness of the stomach by cream, and administering the powder in milk. In many scores of cases amongst Emigrants, especially Chinese Coolies, I have not failed by these means to obtain sufficient tolerance of the drug to enable its characteristic effects to be brought about.

Hubner (Vol. 1. p. 254, Science's Encyclopaedia) says that in these cases of dysentery, where the 'status gastricus' and nausea coexist, it is best to administer an emetic at the beginning,
day 15-35 yr until thorough vomiting takes place, Elixir emetic was formerly used but is not now recommended.

In mild cholera, or acute cholerac diarrhoea, or acute dyspeptic diarrhoea, when nausea exists, and obstinate disturbance of digestion, an Ipecacuanha emetic is the best treatment.

A writer in the Practitioner (Vol. 2. 1848. p. 36) states that if Ipecacuanha is not tolerated it is evidence that the liver is affected, my experience of the drug does not give me any light on this assertion, as I have not met with cases of complete nilderance to large doses when administered as beforementioned.

A few years ago I was induced to try the effects of Ipecacuanha in the second stage of labour, with the object of inducing nausea, and so of relieving muscular tension of the uterus and perineum. No. The effect in this manner was frequently successful, but it also appeared to me at that time that the uterine contractions were strengthened and increased in frequency, and I now have recourse to this method of inducing uterine contractions when needed by the administration of Ipecacuanha very frequently, using doses too small to induce nausea, and repeating them frequently. Another method of employing it is to obtain tolerance very rapidly, by the previous administration of Cocaine if needed. Indeed it is often an
advantage that the first dose should act as an emetic, as this in itself aids much in the expulsion of the Child.

Specacananda has been used much more freely as an emetic of late years, many practitioners having found its value.

The effects of Specacananda in asthma are not always reliable in relieving the spasmodic condition. It may be given in emetic doses with advantage at times, but in very severe cases the method adopted by Seiby (quoted by Lewissoniency. Vol n. p. 580) of administering nauseating doses, instead of doses sufficient to induce vomiting sounds more plausible.

The therapeutic effects of Specacananda, as of other emetics of a directly acting character, are endless, or rather it would be safer to say the therapeutic effects of vomiting are endless when induced for therapeutic requirements, and of all substances that are used to bring about the condition of vomiting, powdered Specacananda is probably the most suitable all round emetic. It is certain in its action if administered in sufficient quantity, though sometimes slow, and yet as a rule causes little or no after-depression.

On account of this somewhat tardiness of emetic action it is not the most suitable emetic to administer in cases of poisoning. Its action is hastened by giving it in, or following it by, a quantity...
This method of inducing vomiting by administering Specacuama with hot water, instead of used in small quantities until a tumblerful has been taken, is the most satisfactory method I have met with in clearing the stomach of its fermented contents, and undigested aliment, and viscid mucus adherent to its walls, when other methods of treatment had failed, in cases of Chronic Gastritis. In ordinary bilious attacks it is frequently administered at the outset in order to cut short the attack. It is not always a satisfactory method of dealing with such conditions as endeavour to clear the stomach by means of purgatives, as this may superadd irritation of the whole intestinal canal, and may even leave behind therein noxious material carried from the stomach and set-up a further cataractal condition of the bowels. It is best to empty the stomach by way of the mouth, as by so doing not only can the offending material be cleared from the mouth; stomach as thoroughly, if not more so, but it is also at the same time removed from the body.

Ringer (Handbook Therapeutics Art. Specac) highly extols a spray of Specacuama wine in obstinate cases of Winter cough, and gives some remarkable results. I have repeatedly acted upon his suggestion with equal benefit to patients, and recently very markedly so in a patient aged 82, who not only suffered
severely from Chronic Canker Cough, but occasionally also from Haemastigmia, his breathing was short, and usually towards evening there was some little rise in temperature. The sputum was purulent thick and heavy.

After a few inhalations of the Specacuamanda spray, the first one or two of which caused some irritation and also some degree of nausea, his condition was rapidly relieved in all respects. The dyspnoea quickly subsided, the evening temperature on the fourth day remained normal, the expectoration about the same time became more frothy and much easier to get up, sleep was more prolonged, and his appetite and general well being were very decidedly improved within ten days.

One other action (also referred to by Ringer, and Speere, P. P.,) of Specacuamanda is its property in small doses of arresting vomiting. This curious effect is probably the result of a slight stimulant action of the small quantity of the drug employed. This should not be the powder, I have found the best results in checking the sometimes severe vomiting of pregnancy, to be brought about by the administration of tablespoonfuls of a weak cold water infusion of Specacuamanda powder, and indeed this is a method very frequently employed for arresting severe and obstinate vomiting from other causes, such for instance as malignant disease about the stomach.

And from its sedative effect on the afflent
Serve fibres in these very weak doses, it may very often be used with most marked benefit in chronic dyspepsia, and forms a most useful adjunct to other ant-dyspeptic remedies, as, e.g., Pulu. Raecho, Bismuth, Soda Phthese, etc., especially when taken a little while after a meal.

For this reason it is that Specacuanha is frequently combined with these remedies and also as a dinner pill, and is of the greatest service in this manner.

Its action is that of a stimulant to the flow of the digestive secretions, and is of great value in assisting to carry forward the products of digestion by its cathagogue action.

As an aid to elimination, on the principles detailed in the earlier part of this paper, viz. that when absorbed into the blood, the secretions of all the secretory organs with which it comes in contact are increased, in order to effect its elimination, it is often combined with mercuric for administration in syphilitic diseases. And for a similar reason I am much in the habit of prescribing it in combination with Potassium Iodide, usually the Tincture Specacuanha in doses of about 5 minims, in such cases as I may require the Iodide for the purposes of an eliminant, as in serious effusions or in lead poisoning.

In the extreme constipation of women, prescribed in pill gr. v. it is scarcely equalled, and does not readily lose its effect.
In concluding this paper I cannot refrain from a note on the chemical or pharmacological side of the question. Though one of our most valuable drugs, not much is really known of this side. That Eucatine is the chief active alkaloid contained in the root is understood, but "more exact knowledge concerning it is needed. At present the therapeutic value of Specacuanda is calculated on the percentage of Eucatine it contains, but the percentage of Eucatine may not be the only guide for judging the therapeutic value of Specacuanda. It has been ascertained that roots from which this alkaloid has been extracted are still possessed of therapeutical and medicinal virtues."

— J. Attfield, Pharm. Journal 3rd Series xxiv 48

On the other hand Paul and Connellup (ib. 61-63) state that this alkaloid is associated with others that are crystalline, and differ from the amorphous base in physical characters, and that different investigators do not agree in their determinations of the alkaloids in Specacuanda, and the amount of Eucatine. This they account for by the possible existence of different alkaloids.

Whilst it is usually stated that Specacuanda contains from a quarter to one per cent. of Eucatine, these investigators think that the amount of alkaloid in Specacuanda root does not differ much from 2%, and Keller (in the same journal) stated that the best qualities contain as much as 2½% upwards.
The most satisfactory method of administering Sponagrum, therefore, would be by the *tincture*, standardized to contain a certain known percentage of *emetine*. But in spite of the apparent difference in alkaloid in different samples of the root, it remains, that for many practical purposes the root possesses properties and advantages that emetine alone does not, on account of the greater rapidity of the powder, and its slower and more prolonged action. I have used emetine occasionally in midwifery practice, and do not consider it to be so manageable as the powder, on the other hand, for the bringing on of mere emetic action, it may possess some advantages, as it appears to have also as an expectorant.