Thesis on
the
Botany, Chemistry, Physiological and Therapeutical properties of the Cistus c. Libanum.

Thomas J. Gray
Leaves moist alive in May.

Perforated a la décoteau.

Three Principles, the Bryonys.

Cystine & L-Dopa

Dopa

Dopa, a pale-brown, powdery, dry, granular, lumpy, material, not bitter, not marked, not toxic, not readily perishable. In dry season it is very bitter, not sweet.

Cystine dark red delapidated very bitter, tobacco-taste, neutral

L-Dopa: red, dark brown, and (with acid owing) a little more red and marked. Perforated the base (colorless). Unmarkable.

Dopa: in cakes, breads, purées, & flour, with or without baking. Harmless but not necessary. In dry season it is bitter, not sweet.

Cystine: dark, brown, often oblong, very bitter, yellow, without bitterness. No bitter, sweet.

Dopa: red, dark brown, often oblong, very bitter, yellow, without bitterness. No bitter, sweet.

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## Contents

1. History Botany and physical characters of the Lathamum  
2. Parts of the Tree containing the active principle  
3. Method of extracting and separating the active principle  
4. Mode of analysis by which we can separate this active principle instead of ores stated by Chevelli and Lassagne  
5. Physical and chemical properties of these principle  
6. Preparation of the crude drug and Active Principle  
7. Uses and mode of administration of the Crude drug and Active Principle  
8. Physiological action of the Crude Drug on the Lat  
9. Physiological action of the active principle on this animal  
10. Physiological action of the Crude Drug and Active Principle on the Rabbit  
11. Physiological action of the Crude Drug and Active Principle on the Dog  
12. Physiological action of the Crude Drug and Active Principle on the Common earthworm, Frog and the Insect  
13. Physiological action on Plantia  
14. Physiological action of the Crude Drug and Active Principle on the Human subject  
15. Modus operandi  
Treatment to be adopted when the active principle of the Lachrymator have been administered in poison and

Theoretical Conclusions.
History, Botany, and Physical Characters of the Cyrticus Laburnum.

The medical or rather the medical-legal history of the Cyrticus Laburnum is confined to the present century. The Ancients make no mention of its poisonous properties, and its physiological and therapeutic effects have never been properly investigated. The term Cyrticus is derived from Cynthis, one of the Cyclades on account of some of the species having been first found in that island. Laburnum, according to Cellier, is derived from the alpine name Labérous. It is called in France, Cyrticus des Alpes, Horns and Faux Ébenier. It is a native of Helvetia and was first cultivated in 1595. It is now cultivated in England on account of its beauty, and is very common in the shrubberies and plantations in the northern counties of Scotland. It belongs to the Linnaeus' class and order Diadelphiea, Decandria, and to the class and sub-class Decotyledones, Leguminuloe of Linnæus. We have a broad and a narrow leafed variety. It belongs according to Professor Bolzoni's classification to the class Decotyledones, sub-class Leguminuloe, section Polypteralae or Diacypteralae, natural order Leguminuloe, sub-order Papilionuloe, genus Cyrticus, species Laburnum. The stem is gorgeous and may, if allowed to grow, attain a considerable size. It is nearly cylindrical in form. The branches are also erect, and externally...
present a granular white silvery appearance. The wood is hard and admits of a beautiful polish. The albumen has a yellow colour while the auramen or heart-wood acquires from the deposit of lignin, a reddish tint. In very old wood this colour assumes more or less of a brownish hue. The appearance of the wood resembles that of the green Elm, and hence the French call it the green Elm of the Alps. The bark can be readily separated from the wood. The external surface of the epidermis has a silvery tint, and the suberous envelope a reddish yellow colour. This phellogen is thick and tough and when the bark is dried can be easily separated. The gran cellular envelop or mesophlolein is very distinctly seen in this kind of bark. The inner bark or endophlolein has a beautiful yellowish white colour. The bark, as well as the stone, has the peculiar not unpleasant odour characteristic of the Laburnum. The medullary rays, which run from the bark to the pith, are very numerous and can be easily seen by the naked eye. The flowers are petiolate, ovate lanceolate in form, and slightly pubescent beneath. The margin of the leaf is reticulated. The petals are perennial, and pinnate. A transverse section of the bark exhibits a structure very like to that seen in a similar section of the stone. The flowers appear early in summer, in the form of simple pendant lilac flowers of a beautiful yellow colour. The flower is papilionaceous, the corolla consisting of petalium,
two alae and carina. It is a pentamous flower, two sepals being superior, one inferior, and two lateral. They are clothed with an adpressed pubescence. The petals, by the law of alternation, have an opposite arrangement. The upper lip of the calyx is usually entire, while the lower one is tridentate. The vexillum is ovate and long, while the carina is very obtuse and encloses the stamina and pistil. The stamina are perigynous and monadelphous. The ovary is superior, one celled, and many seeded. The style and stigma are simple. The fruit is a legume which is long and narrow and contains many seeds. It is also a little compressed. The pods are more or less kidney-shaped and assume, on being preserved and dried, a dark shining appearance. They have a bitter unpleasant taste.

The Lithium is a hardy tree and is reared in its pride. It will grow on any soil but thrives best in that of a light loam or sandy character. Its wood is not unfrequently used by cabinet-makers and turners on account of its hardness, beauty, and durability. Matthiæus speaks of it as being particularly used in making the best kind of boxes.

The Gypsium purpureum has been reported on the Gypsium Lithium and the flowers which result from the species are of a dull purply purple-like red colour. The following
Remarks will be entirely confined to the common fixed
Lobanum.

Parts of the tree from which the active principle can
be obtained.

The active principle can be extracted from all parts of the
tree. The seeds yield them in large quantity. The bark of
the root ston and branches is quite as fertile a source.
The leaves also, when green, yield them. The flowers and pods
also contain them but in a much smaller proportion than
those just mentioned. The pod also, when broken into small
pieces and brought in contact with boiling water, will yield
them in small quantity.

The leaves are most active in April and May before the flowers
expand. The seeds and pods should be collected and dried
in the beginning of October. The flowers are most active in
July when they are in full bloom. The bark of the root ston
and branches may be employed for extracting the principle
during any period of the year.

Method of extracting the Principles from the Tree, their Chemi
ical Analyses.

The different parts of the Optica Lobanum readily
yield their principles to water and the most convenient
mode of extracting them is in the form of Decotion.
This preparation, when concentrated and carefully fil-
tered presents a beautiful cherry red colour. It has a
Slightly acid reaction, reddens reddens reddens, and has a disagreeable bitter nauseous taste. It produces with a solution of acetate of lead a greyish white precipitate soluble in acetic acid. It strikes a deep dark red colour with the peroxides of Irn. It gives with the most sulphides of Irn a pale reddish precipitate which adheres together in small shreds or masses. It mixes with the compounds of gold some copious gelatinous red precipitate. When a solution of ammonium is added to it, we get a greyish white deposit. We, by heating the red oxide of lead with nitric acid, get a dark product, which, after the addition of this fluid in small quantities and at the same time continuing the application of heat, becomes converted into a brilliant yellow solution. Nitrite of silver gives a white flaky precipitate soluble in nitric acid forming a faint yellow solution. Nitric acid, on being added to this solution, produces no deposit, but changes the colour of the concentrated solution to a fawnish yellow which, on the acid being added in excess, assumes an orange tint which, when heated again changes to a faint yellow coloured solution. Lime water, on being added, causes a faint yellow colour and slight turbidity.

We, after boiling the back or any other part, for some time in alcohol, obtain a peculiar yellow solution.
which, on cooling, deposits a substance in the form of flakes. These flakes, when collected and heated, to evaporate all the spirit which adheres to them, have a nauseating, oily taste and are readily soluble in water. This solution has narcotic properties and consists of one of the active principles of the Laburnum which is not very soluble in cold alcohol. I shall describe this substance at greater length after I have given an outline of the method by which we can resolve the crude drug into its different active vegetable principles. In the meantime this short sketch is sufficient to show that alcohol is not a convenient solvent in extracting the active principle of the Laburnum. It is much inferior to distilled water in which they are all readily soluble.

Moreover, by using the latter we exclude the chemical analysis of the Laburnum.

Haring in the first place carefully studied the action of the crude drug on the lower animals and also the symptoms which are said to have supervened in cases of accidental poisoning, came to the conclusion that these symptoms were unlikely to be produced by one individual principle. I thought it was more probable that there existed more than one active ingredient and that the symptoms varied according as one or other of these predominated in quantity, or whether
Combination of more than one acting on the economy at once and the same time produced symptoms of result different from what they would give rise to if they were separated and administered singly. I think I have succeeded in separating these principles which are quite different from one another. I have tried to extract them in various ways and for the inference, I simply used most of the solvents and reagents used by pharmacetical chemists. The following mode of analysis is the simplest and most economical and I believe the only one by which they can be separated with any degree of purity.

Boil the part of the tree from which we are to obtain the principle in distilled water until we obtain a concentrated decoction. We must then filter this carefully and the precipitate it by a solution of bichromate of lead in distilled water. Allow the mixture to stand for some time, and agitate it frequently during this period. We then collect the precipitate on a filter, allowing it to remain on it until all the fluid has passed through. We now collect the substance on the filter and agitate it in distilled water. Pass sulphured hydrogen gas through it suspended in the water until all the lead present is converted into sulphuric acid, which is to be removed from the fluid by filtration.
Heat the fluid which passes through the filter until the excess of sulphuretted hydrogen gas is driven off. If we have then remaining dissolved in the water an acid which for want of a better term I shall denominate Lactic Acid. I shall afterwards describe this substance more minutely, and in the meantime we will continue the analysis. We now pass sulphuretted hydrogen gas through the solution which we obtained after filtering the precipitate produced by acetate of lead, until all the lead is converted into sulphuret. We now remove this sulphuret of lead by filtration. Then the fluid which passes through the filter, until we get a semi-fluid extract. The excess of sulphuretted hydrogen is the acetic acid derived by the decomposition of the acetate of lead, are thus wholly removed. This substance which we have now obtained is what the French chemist Chevalier and Lassaigne discovered and called lactic acid. If these chemists however had continued their observations they might have found that this substance consists of two active principle, instead of one. I shall now indicate how these two can be separated. We after allowing the extract to cool add to it pure pepsic acid spirit. We may add about an ounce of spirit to a dram of the semi-fluid extract. The mixture is to be allowed to stand for 10 or 12 hours and agitated frequently.
during this period, we then filter it through a fine white cotton cloth. The pyrexic spirit which passes through the cloth is then to be prepared by a gentle heat, and at the same time we may condense the spirit if we find proper. It will be found to be pure and may be paid in a subsequent analysis. We may very conveniently evaporate the spirit by placing the vessel which contains it into the boiling water. We can then evaporate it at a very equable temperature, we obtain from the evaporation a dark red perceptible extract which I shall call pyrexic. It is a modification of the name from which pyrexic is derived and, though perhaps not a very appropriate term, will serve to distinguish it from the pyrexic of Chevallier, and Lavoisier. We now take the cotton filter and place it over a vapour bath so as to evaporate any spirit which may adhere to the substance left on the filter. When the substance is sufficiently dry we reduce it to a fine powder in a mortar and then again expose it to heat on the reapplication of which, the pyrexic spirit will be entirely removed. We have then left a dark brown colour, which may be conveniently called Labor medic.

We may perform this analysis in another way. We evaporate the concentrated decoction, after having been filtered, to an extract which, from the presence of the pyrexic
Existent principle, Laruminic and Laburnic acid, from attains a consistence such that it can be reduced to a state of powder. We can then agitate this powder with successive small quantities of Acetone Spirit until the Laruminic alone remains. The Acetone Spirit which adheres to it can be removed in the way I have indicated in the preceding experiment; we can then get the other two principles in the form of an extract by evaporating the Acetone Spirit. We then dissolve the extract in distilled water and then separate the Laruminic acid from the pyrogallic by adding to it a solution of acetate of lead. Remove the Larumate of lead by filtration, and remove the lead from both by sulphuretted Hydrogen gas. The excess of gas and the acetic acid can then be driven off by the application of heat, leaving the two active principles in a state of comparatively purity. This second method is however is very troublesome and is much inferior to the first.

We can not make any advantageous use of chloroform or sulphuric ether in extracting and separating the active principle in the Larumnum. When we agitate the decoction with a small proportion of sulphuric ether, the latter as it rises to the surface Annex with it a portion of the active principle, but it does not enable us to separate them, when the ether added is in excess it
rises to the surface without taking with it any principle at all. Similar remarks may be made concerning the action of chloroform. Charcoal is also of little use in enabling me to separate the principle from each other. It does not however absorb the Labarnine so readily as it does the other two principles. Charcoal, though it can not be employed with much advantage in the analysis, is still of much importance in the treatment of poisoning by this drug as I shall afterwards mention.

I have in addition to these principles detected in the retortum of the combustion of the crude putrid some lime and occasionally a trace of silica. I have also noticed once a star-like group of crystals after cooling a small quantity of the secretion to evaporate spontaneously on porcelain. They resembled the crystals of citric acid.

I shall now give a more minute description of the different active principle which I have spoken of in the analysis and in the first place I shall enumerate the characters of Labarnine.

It is a greyish brown powder which is not crystallizable. It has a slightly nauseous, oily taste but no bitterness or acrimony and is not deliquescent. It is insoluble in cold peracetic spirit but sparingly soluble in it when hot. It is sparingly soluble in cold spirit of wine but soluble in hot alcohol. It is readily dissolv
when ASP is added with water forming a slightly reddishcoloured solution which has a nauseous oily taste. It isinsoluble in sulphuric ether. It produces no change inthe colour of tumeric or litmus papers and has no acidor alkaline reaction. It is a neutral principle and existsin this condition in the tree. It produces no very characteris-tic reactions when mixed with the other substances deriv-ed from the vegetable or mineral kingdoms. It does notproduce any precipitate with acetate of lead, acetate of am-moniac nitrate of silver, chloride of Barium, Schultze'sliquid (Richland of antimony added in small quantity,to phosphoric acid), chloride of mercury, chloride of plati-um and gold, or the salts of tin. It gives with the sub-acetate of lead a hazy yellowish deposit. It does notproduce any peculiar change of colour when added toferrocyanide of Potassium, Richarmate of Potash, peroxideof lead, peroxide of manganese, or chloride of Potash mixedwith sulphuric acid. I have also tried it withother substances remarkable for their beauty of colour, asCarbazotic acid and the preparations of pernigrin butcould obtain no decided change of colour. It is not chang-ed by the addition of sulphuric acid or any of the othermineral acids or bases. We do not get a distinct precip-itate on the addition of Ferric nitrate. If we dissolve a littleof the sulphate of copper or distilled water to which a
small quantity of sulphuric acid has been added and this has added to this a solution of the Laburnum in water, we have the blue colour changed to a pale greenish tint. We shall next consider the characters of Cytosteria. It has a slight yellowish colour when a thin layer of it is spread out on porcelain but a dark red hue when in considerable quantity. It has an intensely bitter taste and an odour somewhat resembling that of tobacco. This odour is very marked when this substance is being dissolved in hot water. It dissolves slowly in cold but very rapidly in hot water forming a yellowish red solution which has the taste and smell of the extract. It forms a similar looking solution in alcohol and paaonplic spirit in both of which it is readily soluble. It is insoluble in ether and phkoform. It is very deliquecsent so that if atmospheric air is accessible to it, it remains of a semipulbic consistence. It can be preserved very well in this form which is not the case when it exists in the form of solution in water. The tincture and the solution in pyaonplic spirit also keep very well. It has no acid or alkaline reaction and is evidently a neutral principle. It is like the Laburnum remarkable in not producing any of the very characteristic reactions with other vegetable and mineral substances. It is when added to a sol-
action of sulphate of copper in water and sulphuric acid, also strikes a green colour but of a shade quite different from that produced by Salammin. It is a much deeper green. It gives with the compound liquor of Soda a dark reddish gelatinous deposit which soon collects into one mass. This reaction is very well seen on a porcelain dish. When it is added to the subacetat of lead we, after a time, obtain a brownish sediment. Salammin gives with it a slight yellow precipitate. We get a faint haze on the addition of chloride of Barium.

We shall now finish the chemistry of the Salammin by giving a description of Salammin Acid. The solution obtained after evaporating the sulphuretted Hydrogen gas, has a yellowish colour, which, as this solution is being slowly concentrated, gradually changes to a red tint which becomes darker until at last we obtain a ferrimetal dark reddish extract. It readily reddens paper and has rather a strong agreeably acid taste. Dr. Taylor, in one of his editions of his work on Medical Jurisprudence, states that it is gallic acid. This is an error for, although in some respects it may resemble this acid, it has character and properties sufficient to demonstrate that it is essentially different. It does not take a bluish black colour with the peracids of Iron for when we carefully examine the reaction, the colour produced will be found
to be of a reddish brown hue. It gives a reddish yellow deposit with the protosulphate of iron. It, when mixed with a solution of prussic acid and exposed to the atmosphere, does not darken in colour but gradually becomes redder until it approaches a blood red tone, and at the same time develops a sediment of a similar colour. The solution, when evaporated, either spontaneously or by the aid of a gentle heat, yields a deposit which is quite ferrous sulphate.

I have also evaporated it in vacuo and examined the sediment under the microscope but could detect no tendency to crystallize. It gives a greyish white precipitate with acetate of lead. It also gives a yellowish precipitate with the iodide of lead. It causes a yellowish gelatinous deposit when added to the sub-acecate of lead. It gives a pale brown precipitate with the perchloride of antimony. It, when heated with the picrate of potash, produces a tarry-red colour which becomes much more intense after the addition of a little sulphuric acid. It gives with nitrate of potash to which a little sulphuric acid has been added a lively yellow colour. It gives with the phenate of potash an orange yellow colour which on the addition of sulphuric acid assumes a plumish yellow hue. It gives no precipitate with the chloride of barium.

Administration of the Pratt Agency and Active Principle.
Distilled water, although the best solvent for extracting the principles of the Laburnum, has not the power of preserving them for any length of time. The decoction, when kept for a week or two, loses its original colour and assumes that of a whitish green hue and soon emitting a disagreeable odour. It also at the same time deposits a gelatinous looking substance. It also generates a gas which on examination, I have found to be carbonic acid. This most probably arises from the suppression of some form of fermentation. The decoction, however, may be kept for a much longer period by the addition of sugar. This addition also serves to conceal the disagreeable nauseous taste of the preparation. A greater quantity of the carbonic acid gas is given off after the addition of the sugar so that the vessels in which it is contained requires to be very firmly packed. The solutions of the individual principles also do not keep for any lengthened period. The solution of the acid may however be preserved in the form during a considerable period. The tincture formed by dissolving the cyanin and Laburnum acid in proof spirit from elegant preparations which do not undergo decomposition. The Laburnum is too insoluble in proof spirit to form a tincture. The cyanin forms a beautiful clear coloured solution when dissolved in proof spirit, and the preparation forms a very valuable medicine.
combines the palmarive and amolyne properties of the
former with the direct sedative action of the latter. The ex-
tract formed by evaporating the decoction keeps well and
may be administered in the form of pills. If it is exposed
to the atmosphere, retains a very slight degree of softness,
arising from the deliquescent property of the cysteine.
The Lautunine is best preserved in the form of powder.
The cysteine, on account of its deliquescent property, remains in
a semisolid consistence and can be readily made into
pills with conserve of rose, which can be kept, without
becoming too hard, for a long period. The powder itself has
no tendency to decompose.

Dose and Modes of Administration.

Decoction Lautunni. We concentrate it until it
attains a specific gravity of 1.024. Two to five minims of
this strength may be given frequently excepted to children. We
may give to adults from 5 to 50 minims

Extraitum Lautunni. The dose of this may be varied from one-
hundredth of a grain to one and a half grains according to the
age of the patient.

Cysteine. It may be administered in doses of from one
half of a grain to five grains.

Tincture cysteine. The tincture may be formed as follows

Dissolve thirteen drachms of the cysteine in a pint of
proof spirit. Baste of this tincture (1 minims) to a drachm
According to the age of the patient.

Acidum Lachrymatum. This may be given in doses of two to ten grains. It may be made into pills with bread, prunes or some vegetable patient. It may be given dissolved in water, spirit of wine, or in a pint of proof spirit. The dose is from 12 minims to a dram.

Lachrymatus. The dose is from 5 to 12 grains.

Cystinae Naphthalae Medicinalis. Four drachms of cystinae, dissolve four drachms of Naphthalae Medicinalis in two ounces of proof spirit. The dose is 8 to 10 minims.

Physiological action on the lower animals.

Physiological action of the crude drug. Its action on the cat.

The action of the Lachrymatus, when introduced into the system of this animal, is not always uniform in its action. This, I consider, is due to a variation in the proportion of the principles present in the different preparations employed. The result also is modified according to the channel by which it is introduced into the system. The animal, when a moderate dose is introduced into its stomach by a catheter, in a few minutes, moves about and shows considerable人民医院. It soon afterwards begins to move its tongue and jaws, and then to retch and vomit. It seldom vomits more than once or twice when the solution has been introduced into the stomach. These symptoms are preceded.
by languor and depression and not unfrequently suffocation of the eyes and sleep. This state of depression continues about an hour or two and then passes off, leaving the animal apparently quite well. It is impossible to kill this animal by introducing the poison into the stomach, unless we put a ligature on the oesophagus to prevent the ejection of the substance from the stomach. The symptoms when the ligature is applied are the same as those produced by a large dose introduced into the economy by the pectoral, subcutaneous cellular tissue, perivisceral cavity, or into the veins. The motion of the pupils becomes. It is sometimes contracted and not unfrequently dilated in which case it readily contracts on exposure to a strong light. The respirating movements are in the early stage, considerably accelerated, but after a time fade to the normal standard. The heart's action is also at first increased in rapidity. The sleep, when the poison is thus injected from the system, never passes into coma, and the animal can be readily awakened. The animal's appetite and digestion do not seem to be in the least impaired although it is experimented on in this way during several successive days. When the same animal is at last killed by the poison being injected into the cellular tissue, we do not find any trace of congestion or inflammation in the stomach. I have occasionally seen a faint discoloration in some parts
but nothing but what could be easily accounted for as the effect of the vomiting. These are the symptoms resulting from the injection of large doses into the stomach. When very small quantities are mixed with the food, the screws will not usually take place, but the animal will soon fall asleep and ponteine for some time. When the drug is introduced into the subcutaneous cellular tissue the vomiting is more certain than when the substance is introduced into the stomach; and when the dose is small the symptoms are similar to those already mentioned with this difference that the subsequent hypnotic effect is much more marked. These also, however, soon pass off and the animal returns without causing the animal any permanent injury. The solution injected beneath the skin becomes slowly absorbed without producing any inflammation or suppuration. This proves that the substance is not an irritant. Similar experiments may be made on the same animal from day to day without impairing the functions of its digestive system and producing no other effect than the usual symptoms when under the influence of the drug shortly after its administration. The rapidity with which they recover is very remarkable even although a large part of the fluid remains unabsorbed on the bowel injected. It would seem that the power of absorption in the bowel is increased or less affected.
injection. We have occasionally, in addition to the symptoms already enumerated, shivering and slight degree of spasm, delirium is also sometimes produced, and not unfrequently a slight diarrhoea. I have noticed also that, in many of the experiments, there is seemingly produced a feeling of cold over the animal's back, or some part. The substance acts in the same way when it is introduced into the system by the action or by injection into a venous cavity.

When fatal doses are administered by injection beneath the skin, the ordinary symptoms become more intense and the respiration more rapid. The action of the heart continues for some minutes longer; and we find, on examining the body of the animal, the venous system and cavity of the heart engorged with dark blood, the lungs collapsed and the left ventricle usually contracted, but no sign of inflammation in any part of the system.

Action of Cysteine.

This substance, when introduced into the stomach in small doses, produces increased rapidity of the heart's action and acceleration of the respiratory movements. The breathing in a short time becomes slower, deeper and more prolonged, and the animal falls asleep. The eyes are suffused and the pupils slightly dilated. It does not produce jarring, though it is frequently administered to the same amount at short intervals. These symptoms usually commence
in about a quarter of an hour subsequent to the admin-istration of the drug. We administer it in the form of pile made with bread crumbs and then sweetened with something to conceal its bitter taste. When we do this vomition does not usually supervene. The solution is more apt to excite vomit-ing especially if, when it is being introduced, the fluid comes in contact with the mucous membrane of the mouth. These symptoms follow its administration whether it is introduced into the system by the stomatogastrocnemius, cellular-tissue or a tear duct. When larger doses are given, these symptoms are preceded by movements of the face and tongue, slight retching, and vomiting which usually commence in about 10 minutes, but do not again occur while the animal is under the influence of the poison. The animal rapidly recovers and its appetite is rather increased than impaired. When fatal doses are injected into the peritoneal cavity the usual narcotic symptoms are produced and the pupils are much dilated. The action of the preparation precedes that of the rectum action so that the case does not include drug and the post-mortem appearance are also exactly similar. Smaller doses frequently administered to the same animal excite a ravenous appetite for food. It will regu-late a 3-pdr. of the substance injected into the peritoneal cavity to kill an ordinary sized cat. One frequently have slight Maximo; muscular twitchings, after such large doses. The post-
prior extremities are the first to become paralyzed. It does not
produce an aperient action on the bowels. A solution of this
substance, when dropped into the eye of the animal, in a short
period usually causes slight dilatation of the pupils. It never
produces inflammation in the tissues with which it is brought
in contact.

Action of Loburinine.

This substance, when injected in moderate doses, one or two minims
into the stomach of the animal, produces in about 20 minutes
hypnotic symptoms. The eyes become resting, and this is a
temporary excitement of the heart, active and respirations.
The pupils become dilated, and the animal feels a sleep from
which it can be readily awakened by any external stimu-
lation. It soon recovers and appears quite well. When the sub-
stance is injected into the cellular tissue it becomes slowly ab-
sorbed and during this period the animal appears languid,
depressed, and sleepy. The animal, while in this state of de-
pression, shows little desire for food. It does not produce life
annihilation or suppuration in the tissues into which it is in-
jected. I have injected four grains dissolved in water into the
peritoneal cavity of a Kitten without the animal showing
any symptoms of pain or inflammation and in a day or two getting quite well. Such an experiment is
usually followed by purging, but I attribute the result
chiefly to the mere presence of the fluid in the cavity.
relating and exciting the vermiforme action of the intestine. This action does not follow the introduction of similar doses into the system by other channels. Such doses generally give rise to a diarrhea, which continues during the absorption of the fluid. The poison, during this period, is most probably being eliminated from the system by the kidneys. This substance produces a specific action when introduced into the system of the animal and may cause a dose of an order to cause death. Small doses, however, usually give rise to languor and sleep. In one animal, while I succeeded in killing by frequent repeated doses, I found the post-mortem appearance to be similar to that produced by the lead drug. The left ventricle was hæmorrhagic and firmly contracted but flabby and contained some dark-colored blood. Vomiting seldom occurs after the administration of this substance.

Action of Lactic Acid on the Cat.

This substance has also narcotic properties. The symptoms, which it produces, are closely analogous to those which follow the administration of the other two poisons. It often administers in solution is likely to cause vomiting and may be ejected from the system. When introduced into the cellular tissue or into the periosteal cavity, it can not be removed from the system by vomiting, the felt of the heart and respiratory muscles become accelerated and there is nothing and vomiting. These are succeeded by narcotic symptoms. The breathing becomes...
slower, deeper, and more prolonged, the legs lowered, the pupils contracted, and the animal falls asleep. We also observe slight muscular tremors while the animal is breathing under the hypnotic action of Atropine, more especially if it is a young one. It does not produce poisoning although it is administered frequently to the same animal during several consecutive days. We should in order to avoid the vomiting give it in the solid form and at the same time encasing it taste by some agreed flavoring adjunct. It like the other two requires to be given in very large doses to produce death. When administered in these doses, the ordinary symptoms are followed by loss of muscular power in the foot or extremities and paralysed Atropine. When the body is opened immediately after stoppage of the Atropine, the heart is found to be still contracting, and the lungs lying in the back part. The thoracic cavity white and collapsed. The cardiac contractions continue for 10 or 15 minutes, the left ventricle being the first and the right auricle the last to stop. The pulmonary arteries and veins and the rest of the venous system are engorged with clear blood. Venous blood is also present in both right and left auricle and ventricles. We, on cutting and compressing the lung, can squeeze out of it a pretty minute but little blood. A pretty mucous is present at the upper part of the trachea. The bladder is also usually distended with urine. We do not meet with any inflammatory indications.
The purgative drug is thus found to be the most active as a purgative, and by separating its component principles we can obviate many of its disagreeable symptoms more especially its emetic properties. This particularly applies to its action on the human subject as I shall afterward mention. In the meantime we shall describe the action of these same substances, or some of the other lower in series.

Its Physiological Action on the Rabbit:

I got two rabbits and during these consecutive days, I gave them nothing to eat except the green leaves of the cypress, Laurus nobilis. They seemed to relish them as they ate them frequently, and in large quantity. They often had eaten a considerable quantity at first showed a little excitement. The breathing became hurried and the heart could be felt beating with increased rapidity. These indications were succeeded by languor, the respiration becoming slower, the eyes suffused, the eyelids closed, and involuntary movements of the head indicating that the animal had fallen asleep. In an hour or two they emerged from this state of depression, with their appetite better increased than impaired, for they again began readily to devour a fresh supply of the leaves. With a similar result, their urine on the second day became turbid and on cooling deposited a white sediment. I now during the next two days substituted the same containing the seeds for the leaves, and the same symptoms were produced.
but more distinct and marked in their character. The eye
were often suffused, the insensitiveness of the head more evident
and not infrequently they approached sleep and the twitching
of the limbs. They showed no indication of pain but it
seemed to cause some peculiar sensation in the throat or mouth,
for in about ten or twenty minutes subsequent to taking
the pods they not infrequently began to micturate and drink
the urine from the end of the urethra. They also, after leaving
from the sense immediate effects of the poison, usually began
to rub their tongue against the surrounding objects. The tongue,
when rubbed with the fingers, felt very hot and dry. This feel-
ing may be occasioned by the inflammation of the poison by
the plants of the mouth for I have observed the same symp-
toms in cats and dogs and when it is taken by the human
subject they usually tell you that they feel its taste in the
mornings. The symptoms mentioned disappear in about two
hours when they again eat the pods with the same
transient effect. I continued to administer the pods and
drank every two hours during the day for two successive
days and at the end of this period they seemed as well
as at the beginning. I now in addition to the pods, made
them swallow repeatedly true or four grains of the root
extract rolled up in the form of pills and followed tlomned
over with bread or butter. One of the two after receiving
repeated doses, died after showing the usual symptoms.
No uniform effect was produced on the pupils as they were sometimes dilated and at other times contracted. The urine began to pass and be passed in larger quantity after the first two days. The feces, after the first or second day began to be passed in smaller hardened masses. The same effects it elicits before death. When the additional doses of the extract were being administered there were not unfrequently dreams of the spinal and abdominal muscles. The symptoms are very slight when the substance is introduced by subcutaneous injection as the absorption takes place very slowly. The other rabbit which was a full grown one continued to live although the extract was given in large repeated doses, I as I was anxious to contrast the condition of its internal organs with the post mortem appearances of the first rabbit, killed it half an hour after the administration of a large dose. The appearance in the two animals was the same and as follows, I on cutting down in a part into which I had injected three times the secretion two days previously, found some of the fluid not yet absorbed and the part itself slightly congested. This congestion I attributed arose merely from the fluid acting as a foreign body in the part; the absorption having taken place so slowly and not to any local irritant property inherent in the drug itself. I, in making an examination of the abdominal cavity found the venous system engorged with dark blood. The stomach and intestines contained a greenish looking matter, but
presented no trace of inflammation in any part of the liver. The liver looked healthy though a little darker in its colour than usual and the gall bladder was distended with a dark reddish fluid. The kidney appeared normal and the spleen contained much venous blood. The bladder contained a small quantity of a reddish coloured fluid but presented no trace of inflammation. The bones of the head, neck and spinal cord were engaged with blood. There was no abnormal quantity of fluid in the ventricle. The lungs presented a red and white appearance and even lying collapsed in the back of the thoracic cavity, they on being cut and squeezed, gave out a putty matter similar to that which was also present in the Wind-Pipe. The two auricles and the right ventricle were distended with venous blood. The left ventricle was firmly contracted and contained little blood. The pulmonary arteries and veins were also filled with venous blood.

The laboratory is thus not very deleterious to Rabbits, and yet when a check or two of a slightly concentrated solution is introduced into the stomach by a catheter, the breathing of the animal becomes rapid, and at an interval in a few minutes, moves back to normal and then makes a few spasmodic movements which are followed by cessation. At the same time the animal convulses, its heart action continues for a few minutes, and in less than ten minutes from the time the solution was introduced, the animal has ceased to live. The venous
System in such cases is found enlarged. I do not think that death in such cases is due to the Labanumum, but rather to the shock given to the nervous system by the introduction of the solution in conjunction with the sudden distension of the stomach with fluid, which interferes with the action of the diaphragm and leads to stoppage of respiration. Moreover, the narcotic action of the Labanumum is seldom manifested in less than 15 or 20 minutes, and the shock arising from the introduction of the catheter would better unmask than increase the absorption of the poison. If we are experimenting on Rabbits, wish to avoid all traces of failure, we should never employ the Catheter. It is also well known that during the winter season when the food is scarce the Rabbits and Mice have recourse to the Labanumum bark, which they strip from the stem and eat, and, in some parts of the country, Labanumum trees are planted for a protection to the surrounding plantations. These animals are doubtlessly in this narcotic a temporary relief from the feelings of hunger which they cannot allay in the natural way. Professor Clendinnen reports that Dr. Ross of Dornoch found that picrocyanate with the solution produced rapid death in the Rabbit with convulsions as the leading symptoms. I have repeatedly tried the experiment but in no case did the animal die. It showed the hypnotic symptoms already mentioned and its rapidly recovered. The symptoms produced by the principle when given separately are the same as those already enumerated.
Action of Lachrymacia on the Dog.

The symptoms produced on the dog are very similar to those on the cat, and the action of the same dose is just the same. It is very small doses, like a hypnotic, and when they are repeated at short intervals during two or three days, the bowels become constipated, but when in large doses during a long period, it acts as a slight emetic. This, as I shall afterwards try to prove, is due to its action on the liver. When large doses are introduced into the animal's system, it is less than 10 minutes, begins to show evidence of weakness, and soon after vomits. These are followed by narcotic symptoms provided the substance has been introduced into the system that it can not be ejected by vomiting. We find, when death supervenes, the lungs blackened end of a white colour, the cavity of the heart containing dark blood, and the venous system engorged, but no inflammatory indications. Spasm of the lungs is a frequent symptom when the drug is administered in fatal dose. The pupils are sometimes dilated and at the time, contracted. A delirium is produced when we continue to give small repeated doses during two or three successive days. The person would seem to be eliminating by it, which forms begin to exude themselves in various parts. Delirium is also a frequent con-

When the poisons are administered separately, the symptoms are less. A narcotic without that tendency to vomit.
which follows the administration of the crude drug. This result is most manifest when they are administered in the solid form or mixed with the food. We thus avoid the irritation produced by the introduction of the catheter or the shock which is connected with subcutaneous injection. The Lathyrine acid but reacts the proper object, while the Lathyrine and Lathyrine acid have a tendency to dilate them. When the Lathyrine and Lathyrine acid are administered in large doses in solution they may be vomiting more especially after the latter.

Action on the Common Faeces-column.

When the common faeces-column is placed in a solution of Lathyrine or in a solution of any other principle, it at first twists itself about but soon becomes placid and motionless. When it is removed some minutes after it presents the placid condition it is found to be still clear and to move on the application of violence. A local paralysis may be produced by placing only a small portion of its form in the fluid.

When the Lathyrine is injected into the abdominal cavity of the frog, especially the cord of venous its protein substances

precisely death.

When the seeds or substance packed in the decocation are gratified, a hypnotic effect is produced and if the quantity taken is large it will occasion death.

The action of the Lathyrine or a similar of its principle are equally deleterious to the influence.
The Lyciumum also exerts a poisonous influence on plants. I obtained two slips of beech and put one into water and the other into a decoction of the bark. The first remained fresh for several weeks. The flowers of the second began to drop in 48 hours and rapidly became faded and shrivelled and the rest of the plant also soon began to wither and die. I performed a similar experiment with two slips of Elm with a similar result.

Physiological action on the nervous system.

Small medicinal doses of the decoction produce in the first place a little excitement and the patient will often tell you that they become quieted and frightened. There is slight increase of the pulse, and the respiratory movements are also a little accelerated. This effect is temporary, and the pulse soon falls to or a little below the normal standard. These symptoms are succeeded by lassitude and tendency to sleep. It is generally believed that the Lyciumum in small doses produces poisoning. This is not the case for I have tried it in forms repeated doses, week after week and in none of these cases have the results followed. The bowels on the contrary, almost always become constipated. In one class of cases only constipation was not produced, namely in those who were the subjects of bilious dyspepsia. In such cases, the effect is regulating the bowel action of the bowels. It increases the appetite and improves the digestion. It may do so from its bitterness, acting...
as a stimulus to the peristaltic movements of the stomach, 
but more probably it has a more permanent effect by in- 
creasing the tonicity of the muscular power by being absorbed 
into the blood and influencing the polarities of the nervous 
nerve. It very seldom produces diarrhoea. It has a slight 
effect as a diuretic. If we measure the quantity of urine passed daily 
before we administer the drug, and again after its administration, 
we may find in the latter case the quantity is increased fairly 
to the extent of a few ounces. In some cases however, we may find 
that there is scarcely any perceptible increase. It produces no 
uniform action on the pupils. The great objection to the use of 
the crude drug is its liability to cause sickness followed by vom- 
iting. We can not give it in such a dose that will produce 
a marked specific effect with any certainty that 
it will not be followed by these disagreeable symptoms. 
We may however avoid these by administering it in a dose 
which I have recommended and although it may not always 
produce sleep, it will still produce an analgesia in allaying 
vibration and be followed by many important results. 
The first dose may also produce sickness without the subsequent 
dose being followed by any such result, and even although 
sickness and vomiting do ensue, they need not occasion 
any pernicious, for they soon pass off without at all in- 
fluencing the patient. The lebanon or the crude form col- 
sists the starch, giving them either a plain clay or dark appearance.
I think that this result is due to the action of the acid on the bile. The crude drug in small dose has the power of regulating the biliary secretion. It would be difficult to prove this, as it would require a series of experiments such as those made by Dr. Scott on the action of Mercurius as a cholagogue. I can only state that this drug has a peculiar attractive power in Biliury Alarming. These are the effects of small dose. But crude drugs on the human system. A number of cases are on record in which children have been attacked with severe symptoms after eating the seeds. Some of the symptoms enumerated are quite incompatible with the results of my own experiments. In the Lancet 1840, 86, 532, eleven cases are described by Mr. Bonney of Montrose, in which he states that boys from seven to thirteen years of age, who had eaten from 1 to 5 lb. the seeds, were attacked with severe symptoms such as the following: dilated pupils, languid pulse, nausea, severe vomiting and purging. These cases must necessarily be very imperfectly described. It is stated in the report that medical advice was not obtained until the hour after the symptoms began to manifest themselves, so that the effects produced must have nearly all passed. It is due to Mr. Bonney's care. Sometimes even then administered. He does not mention the emetic he employed or whether he administered it immediately to all of them. He states that purging occurred in three out of the eleven who had partaken of the seeds, and I am inclined to think that in two
the purging was due to the pife and emetic and not to the action of the Lebanonum. He does not mention when the purging supervened but it is not probable that it took place before the emetic was administered which must have been about an hour and a half subsequent to the taking of the pills. Moreover he must have derived his information about the number of seeds eaten from the boys themselves, upon whose statement in such a case he could not place implicit reliance. It is quite absurd to suppose that a boy of the age of 9 years would suffer from vomiting and purging from having eaten only one seed. I admit that nausea, vomiting and subsequent depression are the symptoms which will follow an over dose of the seeds in any of the parts of Lebanonum but I hold that we have no sufficient criteria derived from recorded cases upon which we can come to the opinion conclusion that small dose of the crude Lebanonum produce a cathartic action. I have found in the literature that when I gave 3 or 4 drops of the strength of the solution already mentioned to children 5 or 6 years old, constipation was the effect, albeit with a slight change in appetite. Moreover, I have found, by injecting it into the cellular tissue in the neck, that it is not an instant and in every case in which I have found vomiting to occur, this symptom was always preceded by nausea and sickness, proving that the vomiting is due to some action
on the nerve centres and not to any local irritant produced in the stomach. They are two or three. The case recorded in which purging is said to have taken place, I think that, when it does occur it is due to nervous shock. In this case in which it is said to have occurred, it was preceded by vomiting and ejection of the seeds from the system before any great amount of the poison could have been absorbed. Moreover, the case recorded in which several symptoms supervened without purging taking place at all, I am confident that subsequent investigations will confirm the statement I have made that the mere presence of the seeds is not a precaution. In the three following cases the poison must have remained a considerable period in the stomach itself, although the symptoms were extremely severe, purging does not seem to have been produced.  

London and Medical Journal Vol. 62. 1829. A juror wrote, having eaten some Levurusum, flowers, became affected in the following way. She had fever of the continuous, abnormal tremors in her arms, muscle of the face, cold sweat, destruction of hair, and lachrymation, pulse nearly imperceptible, and occasional attempts at vomiting. She got from warm and cold and then vomited the flakes and from afterwards became quite well. We have two cases described by Dr. Steele in which he states that the symptoms were purely nervous. The first was a child of two years of age, who, after eating some of the seeds became pale, cried instantly, and then became insensible,
There was also coldness of the body, and lividity of the face. Vomiting was induced and the seeds discharged. The child soon became quite well. In the other case, incontinency was also the leading symptom, but there were also present a weak pulse and pouting of the mouth. This child was treated in the same way as rom got quite well after omitting the seeds. There is no mention of fever having occurred in either of the cases. There is another similar Kebbe Case perfectly described by Professor Christian in the Edinburgh Medical Journal Vol 60, 1843.

In this case, a convulsion of a considerable quantity of mucus had been released by emulsion back by one of the other servants. She demurred to having the child at all, and in five minutes was attacked with violent vomiting. The vomiting and vomiting continued to occur throughout the remaining night and subsequent day with churning, pains in the abdomen and great debility. Vomiting commenced on the morning of the second day. The woman, vomiting and purging continued to recur from time to time and she fell in her body, flesh and strength. She was visited about 9 months afterwards by Dr. Ross, who was legally employed to investigate the case. He found her laboring under symptoms of gastro-intestinal irritation with vomiting, particularly after food, pains in the abdomen increased by pressure, diarrhoea, tenesmus, dyspeptic stools, slight constipation of the bowels, great debility, an increased appetite, tumors, labors...
breathing, a frequent easy excited pulse, and an acæsomic
Cardiac beat with a full bladder, countenance and a pale
stained tongue. This case is certainly a curious anomaly. The
vegetable principle could scarcely have failed to have been expel-
led from the system were violent vomiting ensured five min-
utes after the food partaken of the poison, and during it, that
period very little of the poison could have been absorbed more
especially as it must have been considerably diluted. It is pro-
bable that though the nausea and vomiting were due to the action
of the poison, the subsequent purging in 48 hours afterwards must
have arisen from the shock given to the nervous system, partly
from the mental emotion which must have been excited by
the suddenness of the attack, and partly from the frequent re-
currence of the violent ecranstic efforts of vomiting and
that this exhaustion was kept up and increased by the con-
tinuance of it during these. We can hardly suppose that the dan-
breath was caused by the direct action of the Lebarum since it
occurred so long subsequent to the administration of the substance.
very little of which could have been absorbed into the system. It
is well known that depressing stimulants are in certain individ-
uals, certain cause of a profuse diuresis and I think it
is to thins that we must look for an explanation of the
occurrence of diuresis in cases of accidental poisoning with
the Lebarum. Moreover it is not unlike that the book who
had no medical attendant will be at the time of attack,
and in ten or more minutes the patient gets uneasy and falls asleep. The sleep may or may not be disturbed by dreams. I have found on inquiring that those who complain of these phenomena are similarly affected when under the influence of a dose of morphine or laudanum. If the patient is strong there is little or no disturbance produced, but if weak and exhausted they usually perspire freely. The pupils are usually contracted, and the patients awaken from their sleep without any disagreeable symptoms either then or subsequently. I have continued to give it in medicinal doses, repeated every three or four hours daily for a week and, at the end of that period, the appetite and powers of digestion were very much increased. There was little or no perceptible change in the quantity of urine passed during this period. The intestinal evacuations were slightly darkened in color but otherwise similar to what they were before the administration of the drug. I have noticed no rise in the blood pressure. I have not seen the effects of any large doses on the human subject but I have no doubt from what I have seen it produce in the lower animals, but these would be the ordinary symptoms of morphia.

Action of Cycotinac.

This substance produces similar symptoms. It acts as a soporific and analgesic without causing sickness. It increases the appetite and increases the powers of digestion. It causes a slight dilatation of the pupil. It has no special action on the
would have recourse to some nostrum or other in which she had confidence in order to obtain relief; and the most likely thing that the unprofessional mind would suggest in such a case would be an opium tablet. The places, which we have described, are imperfect in so much as the symptoms of those in which purging has occurred have been collected long subsequent to the accident, or this phenomenon has supervened after the patient has undergone a course of treatment in which emetics hold a prominent place. It is however probable that the Laxamenum, when administered in large doses, will produce an opium-like effect more especially in those who are the subjects of Bilious Dyspepsia. It would produce such a result in consequence of increasing the secretion of bile and rest by any inherent irritant property. Large doses given to adults will in themselves neutralise the ultimate effects of the drug by the slower passage and rapid renovation of sickness and vomiting and in consequence of the latter, egduction of the poison from the system. Children, on the other hand, by the weakness of their nervous power and their susceptibility to the influence of morbid, might succumb to the action of the drug before the vomiting could take place.

The opinions of Chevalier and Lassaigne, which I have taken to be a compound substance, will, in the dose of half a grain to two grains, produce acceleration of the pulse and irritate the movements, preceded by languor and depression.
Sleep is also produced in many cases. It is produced in small doses, quite slantly, increases the secretion of urine, but not affect the action of the bowels. If in small doses, it increases the appetite. The first objection to the use of this is, as in the use of the crude drug, the tendency to cause sickness and vomiting. We can seldom give it in such a dose as will produce a deep soporific effect or continue it for any length of time without the occurrence of these disagreeable symptoms. I took 5 grains of this substance and I found the result to be very similar to that produced on M. Chenuellier who took eight grains.

There was a temporary increase in the rapidity of the pulse and the respiring movements, and in twelve minutes I became giddy. This giddiness was rapidly followed by sleepiness and vomiting. There was subsequent languor with tendency to sleep which continued about two hours and then gradually passed off. The pupils were dilated. I did not, like M. Chenuellier, experience any sense of pinching beyond that connected with the mechanism of vomiting. I portion of nothing to mitigate that the action of the drug. I was quite well in four hours with the exception of a slight headache. I did not observe any subsequent effect on the economy.

The cerebral action of Leuconor acid.

This substance, when given by force, causes 2 to 6 grains in about 10 minutes, causes a little excitement of the pulse and respiration.
function of the intestinal canal. In some cases, procto
discomfort. The sleep produced by this substance is more apt
to be attended with dreams than that caused by Lebarvon. The
dreaming thoughts are more or less incoherent, and usually
of a pleasant description.

Action of Lebarvon.

The symptoms produced by this substance are so similar to
those produced by Lebarvon that I need not again enumerate them. The primary excitement is ter-
cifically perceptible. The pupils are slightly dilated. It
paralyzes the bowels. It does not cause sickness and forms a very
good hypnotic. It very often produces slight diaphoresis.

Modus operandi of Lebarvon.

I am of opinion that it acts by being absorbed and then
is thrown out through the circulation to the nerve centers and
so modified, these connected with the functions of respiration
as to prevent the complete change of venous into arterial blood.
The imperfectly oxygenated blood, circulating through
the inner phrenic nerves, affects the nerve centers already diminished
in their powers, by the direct action of the poison, so to paralyze
the respiratory muscles. The heart, in consequence of the stop-
page of the respiration, does become drenched with blood and
becomes supersaturated. The action of the poison is proved by
its producing the appearance when injected beneath the skin to in-
roduce a serious feeling as well as by its more rapid action than...
into the latter.

Therapeutic action of the Lebanon-

Therapeutic action of the Prune Drug.

It is very beneficial in cases of Bilious Dyspepsia in which
the patient is subject to periodic attacks of bilious vomiting
and diarrhoea with constipation in the intervals. It should be
taken in small doses which do not bother the patient, three
drachms before meals and continued for about six weeks or six months.
The patient's appetite will be increased and the bilious attacks
will cease to recur. I have thus cured cases of very long standing.
It is also very useful in children who are suffering from int
ability of the stomach and vomiting after food has been taken.
It may succeed medical case when other means fail. The dose may
be given about 10 minutes before food and its regularity will
cause sickness. In small frequent repeated doses, from
a good palliative in Asthmatic Cough. I have also used it with
advantage in the nausea and sickness occurring in the early
months of pregnancy. It may also be employed with success
in chronic Diarrhoea, and in such a case we may employ it exter-
nally as well as internally. The individual should take it every
two or three hours, in doses as large as 20 grm. be taken without the
causing sickness. It may also in the same way be used in
cases of Diarrhoea, keeping the parts constantly moist with the de-
scription, while the individual is at the same time taking frequent
bath's repeatedly doses internally. It fails like all other remedies, often
The cough in Bronchitis. It may also, in female repeated doses, be used in inflammatory affections of a puerile nature. I have employed it in one case of Empyema with very good effect in allaying and preventing the paroxysms of Dyspnoea.

The effective action of the different Principles.

I have not had sufficient time to test the individual properties of these principles in the pure of disease to intensively as I could have wished. I am confident that a careful investigation will elicit facts of no small interest and practical value. There is one class of cases in which the cystines and the lactic acid will be found to be invaluable. I allude to disorders of the digestive system, and more especially those in which we have pain and vomiting after the introduction of food into the stomach. They will, in such cases, check the vomiting and at the same time improve the appetite and increase the process of digestion. They are in this respect much to be preferred to the preparations of opium which come or later impair the functions of the digestive organs. They have also the advantage of not producing constipation. The three will readily pro-

duce sleep, if such a result is desirable, and may thus be employed in neuralgia and other painful affections. In such cases, they may be conveniently substituted for opium, more especially if any lachrymatory in the constitution of the patient prohibits the use of the latter. I have no doubt but that the cystines, from its intense bitterness, will be found
to be of no mean power. The Lemanum has cel-
metine anaodyne and specific properties, while the Gasteria
and Lemanum acid have these combined with valuable vis-
archic virtues. They can be made to have the same effect as op-
jium on the bowels by combining them with gallic acid.
Incompatible.

The crude drug — It is incompatible with the salts of lead,
salt of tin, ferrum, and the preparations of Lemanum
Gasteria. It is incompatible with ferrum and the prepara-
tion of Lemanum.

Lemanum acid. It is incompatible with the salts of lead and tin.
The Principle of the Lemanum are yielded by the tree in small
quantities, and extracted at little expense, by the method
I have already indicated, that they could be used in medicine
at a very cheap rate, and I am sure that they would form
a valuable addition to the Pharmacopoeia.

Treatment, in poisonous doses.
Little or no treatment will be required when the crude drug
has been given in large doses. This substance, in a dose much
lesser than that which would be required to destroy life, will
be followed by nausea, sickness, vomiting, and evacuation
of the poison from the stomach. Emetic in such cases will
only be known by increasing the subsequent exhaustion.
Our duty is rather to rally the patient by stimulants such
as the preparations of ammonia, more especially the Spirit of Ammonia; and others. I have tried other stimulants, but none bring about the recovery of the lower animals so rapidly as this drug. It may be owing to the remarkable property which ammonia has, in addition to its stimulant action of increasing and preserving the fluidity of the blood and thus facilitating its circulatory through the capillaries. If we suspect that there is still some of the poison remaining in the system, we should administer a tablespoonful or two of charcoal. This substance rapidly absorbs the toxic principle of the Lepraxum in the stomach, renders them inert, and prevents them out of the system by intestinal evacuation. When the charcoal is given three or four days after a large dose of Lepraxum to dogs, the animals only show slight Dowiness. If similar doses were given without the charcoal, they would be followed by severe vomiting. I have tried in the same way the preparations of Belladonna and other drugs which have been found useful in cases of poisoning with the active principle of the vegetable kingdom, but without any decided beneficial result. The preparations of ammonia do not prevent the poison acting on the system, but counteract the subsequent depression. In the case of children in which vomiting in some cases may not occur, I administer an emetic. If vomiting had already occurred I would not give an emetic, but would rely on charcoal and small frequently repeated doses of ammonia.
Ammunice aromatics. This treatment if employed in time
will I have no doubts in all cases succeed. I may however
mention that I have succeeded in raising animals after
the respiration has ceased by artificial respiration combined
with the introduction of a small quantity of blood by making
an opening into the right jugular vein in the lower part
of the neck. This bleeding relaxes the right cavity of the heart
which soon become overdistended with blood. Artificial res-
piration alone rarely succeed.

Practical Conclusions.

1. That the prude drug has no irritant properties and that
the sickness and vomiting for which it produces when
administered in large doses are due to some action on the
nervous system.

2. That these disagreeable symptoms may be avoided by
administering it in small doses.

3. That it is not a purgative when administered in small
doses as it generally supposed.

4. That in small doses, it has peculiar therapeutic properties.

5. That the activity of the drug is owing to the presence of
three vegetable principle and not to one as was formerly
supposed.

6. That these principles when separated have valuable narcotic
and stimulant properties.

7. That they have not the tendency of the pure drug to
produce sickness and vomiting.

8. That these principles are yielded in such quantity by the lemonum that they might with advantage be introd. into the pharamcopoeia.

9. That the principle are yielded by all parts of the tree, but in largest quantity by the bark and seed.

10. That the administration of pharamum will be found useful in the treatment of poisoning by the lemonum.

I might extend the Thesis to a much greater length by giving a detailed account of all the experiments, but as I think that this would be tedious to the reader, I will confine myself at present with the preceding general summa-

Edinburh.
31st March 1861.

Thomas S. Gray.