A THESIS.

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No can abunt

Lube poesia Intellect ubi

Lubere ad infinitum 2

Lipse equal to fideacon 3
Botany & Natural History.

1. Generic characters.

Veratrum viride was placed by Linnaeus but has been more recently transferred to the class Hylandria virginiana.

Its generic characters are described as flowers polygamous; perianth six-petalled "consisting of a spurred corolla with a calyx" (Bipetal): the segments broad, concave, imbricated, nearly equal, striated without a pit at the base; stamens six, equal, inserted in the receptacle at the base of the segments; filaments tubulate, almost peniform with confluent cells; ovary with three diverging stigmas; capsule three-horned separating into three many-sided follicles; seeds compressed curved at the apex: a part of the flowers are barren.

2. Specific characters.

Rhinome thick, fleshy, truncated.
above and solid below, with numerous whitish radicles. Stem tall, roundish, striated, pubescent. Leaves sheathing, the lower one large, oval, acuminate, pubescent, strongly rubbed, and pilate.
Upper leaves generally narrower, the highest being linear-lanceolate and forming the function of bracts.
Flowers numerous, in compound racemose axillary from upper leaves and terminal, the whole forming a sort of panicle.
Peduncle short, rounded and downy.
Bracts boat-shaped, acuminate, to-matate, many times longer than their pedicel.
Perianth of six green oval acute serrated segments, the alternate ones longest all terminating at the base in a sort of claw with a thick-rounded cartilaginous edge.
Stamens six, with recurved filaments and roundish two-lobed anthers; varies three cohering with acute recurved styles as long as the stamens; part of the flowers are barren and
have only rudimentary style; fruit consisting of three capsules united together and adhering by their inner side; seeds flat, winged and air-briected.

It is indigenous to the United States and Canada, being found chiefly in boggy meadow-lands and by the sides of small rivulets and rocky districts, forming by its large green leaves and tall flowering stalk a very conspicuous object. Its flowering season is from May to July.

**Materia Medica:**

The root or rhizome is the official part and is somewhat more than an inch long by an inch in thickness, thick and fleshy, terminated above but solid below with very large white radicles. In the raw state it has a disagreeable odour lost on
Drying. It has a harsh bitter taste, leaving a lasting impression on the mouth when chewed. It is described by Bigelow as "abounding in a resinsious juice which adheres closely to a knife, with which the root has been cut - this resin dissolving abun-
dantly in alcohol the solution being rendered turbid without deposit of precipitate by the addition of water.
A decoction has the bitter taste of the root imparted to it probably owing to the presence of some extractive principle; the watery juice of the root after distillation is an early un-
pleasant in taste." In sensible
properties, it bears a strong resinate-
lance to the Veratrum album, and hence if you take also into con-
sideration the close botanical relations between the two plants it may be
supposed to contain the same active principle - veratrine. The root should
be selected in autumn, and ought
but be kept longer than one year
as it is apt to deteriorate.

Preparations:

It imparts its desirable virtues to
water and alcohol and may be used
in substance as a powder or tincture
or an extract.

The tincture is made of two strengths:
1. Dr. 0.5 good of the strength of six ounces
   of the fresh root to the pint of diluted al-
   cohol.
2. Dr. 5.000 - eight ounces of the dried
   root to a pint of officinal alcohol; the
   latter being the preferable.

The extract is made by insinuating
the juice at a low temperature; the
butter of the root are much impaired
by boiling and the extract prepared
from the alcoeture is asserted by Dr.
0.5 good to be very inert.

Doses and mode of administration:

In powder: qtr to 1/2 to be repeated every
three hours and increased if necessary.
qtr to 1/2 will produce vomiting.
In tincture (towards) six to eight drachms to be repeated every three or four hours and increased of necessity.

In extract: gr. 1/4 to 1/2 as above: the increase of the dose to be carried on till some obvious effect is produced: a depression of the pulse accompanied or not by nausea and vomiting.

Preparation of the tincture: the root must first be thoroughly cleaned by washing and sliced into quarters without separating the radicles: then it must be thoroughly dried by exposure to a current of hot air for about twenty-four hours: comminution is then to be effected by first breaking up with the mortar & pestle and then finishing by passing through a mill so as to thoroughly pulverise the root. The root is then macerated in officinal alcohol — strength 94.1 per cent. and the product evaporated to the requisite strength.

This is the preparation recommended by the Committee of the Middlesex East District Medical Society, Mass. U. S.
Chemistry:

From a careful analysis Mr. Henry Worthington (American Journal of Pharmacy, Vol. x. p. 99) found the root of the V. Vinida to contain gum, starch, sugar, bitter extractive, fixed oily matter, coloring matter, gallie acid in combination as a sapo-gallate (Griffith) with an alkaloid identical with beratoia, lignum and the salts of lime and potassa. The alkaloid principle is very nearly insoluble in water, more soluble in ether, and entirely soluble in absolute alcohol. This explains the superiority of Norwood's tincture in which high proof, to that of Alberta in which diluted alcohol is used.
Physiological Action:

Irritant. Nitric acid is locally an irritant, and in its general action, sedative to the nervous system and circulations, and more or less stimulant to the secretions.

Applied to the skin it acts as a rubefacient and vesicant. Snuffed into the nostrils in the form of powder it acts as an emetic; swallowed it causes uneasy sensations in the epigastrium. Constitutionally it produces in small, transient doses feelings of chilliness, and considerable sedative effect on the force and frequency of the heart's action so much so that by the employment of two such doses the pulse may in a very short time be reduced to beats below its normal frequency (Horwood), with languor and loss of command over the muscles. Nausea and vomiting produced by larger doses are said to be seen preceded by tingling and pains in the joints. The vomiting is according
to be good peculiar inasmuch as it seems to be due to actions of stomach alone in-
dependent of the diaphragme and abdominal
muscles. It is frequently protracted and
accompanied with severe retching. It
is frequently delayed considerably after
the exhibition of the medicine; as much
as three quarters of an hour. However,
severe it is but little accompanied by
nausea or any marked exitus either
before or after its occurrence. Does
producing these effects produce also
proportionate depression, the pulse
failing so or so beats, the surface
being pale and cold, and the patient
complaining of chilliness and numbness.
There is headache, vertigo, dimness of
vision with dilated pupils, faintness,
Stiffness and want of command in
the Voluntary muscles.

It is asserted by all the author-
ities that it seldom if ever purges.
As regards the recrrecution they
are all stimulated by doses insufficient
to produce nausea and if nausea is produced the perspiration is markedly increased.

Theory of the Action:

Veratrum viride would seem to act as a sedative directly on the nervous system, small doses insufficient to produce nausea & vomiting producing a certain amount of depression marked by a fall in the frequency of the heart's action and the other effects already described; larger doses producing a greater degree of depression on the system generally marked in addition to the effects of non-nauseant doses in an exaggerated degree by nausea and vomiting which would seem to be the result of the direct irritant action of the drug than as a part of the general constitutional action through doubtless leading by their occurrence to increase that action
Therapeutic action

Veratrum viride is assailed by the American authorities to be a powerful prompt and reliable arterial sedative in the highest degree; but at the same time manageable and safe, and is recommended for employment in the treatment of all inflammatory febrile affections, in organic and functional disorders of the circulation and in some diseases of the nervous system.

It is used entirely and simply as a sedative destitute of any "specific" action but profiting in the very simplicity of its action advantages other than those agents employed as sedatives. That the advantages are which are claimed for it the succeeding table compiled from the report of the Massachusetts Medical Society before mentioned is intended to show.
Advantages of Veratrum viride

Compared with Veratrum

Veratrum equally fulfills the two first indications.

But does not reduce the quantity of the vital fluid which is the objectionable and injurious feature of Digitalis.

Veratrum can be employed an indefinite period with safety and when suspended its effects speedily subside.

Compared with Digitalis

Veratrum is prompt sure and not cumulative as far as present observations go - left of a diuretic.

Compared with Vaterpulvis

Veratrum does not seem to change the character of the blood, alters the secretions, purges in full dose and its effects are permanent or to speak

Compared with Colchicum

Colchicum is not so certain as more of a diuretic, purges in full dose rarely vomits if has been observed to increase the urine in quantity & specific gravity

Veratrum vs. is more sure, left of a diuretic, vomits, and has been observed to increase the urine lowering the specific gravity.
Advantages of Veratrum viride (cum.)

Compared with Atropine

Atropine is narcotic

Veratrum v. is not; in the full physiological effects the mind is clear

Compared with Veratrum album

Veratrum album is a drastic purgative

Veratrum v. rarely purges

Evidence.

I have been entirely disappointed this spring in meeting with suitable cases of chronic inflammatory affections on which I might, in a series of experiments, satisfy myself as to the powers and advantages which this drug is asserted to possess; and shall therefore be compelled almost if not altogether to rely entirely upon the published observations of the American observer.

All of the emetic and purgative actions:

I find a series of experiments made by Dr. John Warren in the Boston Almshouse early in
the present century and repeated at length in Bezoard's Medical Repository which seem to afford satisfactory evidence of the peculiarities of the action of this drug on the intestines, I here give an abstract of them.

Number of cases experimented on - 30 of which 17 died.

Preparations used - the powder of the root.

In one case, gr if was given causing slight and temporary nausea.

In three cases, gr. iff caused - in one vomiting to a slight degree - in one to a considerable degree - and in one no emetic effect.

In four cases, gr. iv. one only operated - the operation being inconsiderable.

In fifteen cases, gr. iv. was given causing no two as complete and thorough vomiting as could have been produced by any other emetic - in one nausea only in four no emetic effect.

Two cases had gr. viij. administered - of these two, one acted satisfactorily - two did not act.

One case, gr. K operated very thoroughly.

Of all the 28 cases, in 16 only was vomiting produced to any marked extent.

The vomiting produced was not uncommon in
Violence or distressing the sensations being much these during the effects of an ordinary narcotic, its action is more severe than that of Speracium, but less so than that of Antimony. Doses of six grains seemed to produce the effect as thoroughly, and in a larger proportion of the cases, than even larger doses. The operation of the medicine took place at six hours after its administration—sometimes two or three hours slept one nine hours.

In no instance was there clear evidence of purging being produced by the medicine.

From comparative experiments with Veratum album it was concluded that the Veratum Oxide was the more active of the two.

Bo. of the action as an arterial sedative.

1. General evidence

(a) in pneumonia

Dr. H. H. Toland of San Francisco writing in the Pacific Medical and Surgical Journal says,
"in pneumonia and pleurisy the medicine is
"invaluable after moderate depletion, the pulse
"being diminished in children, from 150 beats
"in the minute to 75, or 10 or 12 hours without
"the production of nausea or other unpleasant
"symptoms; upon adults it acts as peacefully
"and speedily as being possible by its acidity
"to reduce the pulse to 35 beats in the minute
"without either distress or danger."

Dr. J. S. Smith reports in the Nashville Jour-
"nal of Medicine & Surgery four cases of pneumonia
"in which he gave the veratrum and states
"that in his experience veratrum does not reduce
"the force and fullness of the pulse as pretentious
"to the frequency, that it only reduces the freq-
"uency, while the force and fullness assume
"the normal standard; when the frequency
"of the heart acts as to reduced the heat
"of the skin, thirst and pain; consequent upon
"the inflammation subsides and free perspiration
"is induced."
out this article as we would if we were dependent of cinchona and its preparations in the treatment of intermittent and remittent fevers.

Dr. G. Gaster in the Transactions of the Belmar Medical Society reports two cases —

In one case of pneumonia of the right lung the veratrum was preceded by espium bleeding and administration of calomel in combination with nitre and tartarised antimony.

In the second case with the exception of a few doses of nitre and antimony the veratrum was the only medicine employed.

Both cases terminated favorably within four days after the veratrum was commenced with.

(b) In pneumonia:

Dr. H. H. Toland — says —

"Having administered it alone in one of the most powerful and unmanageable of the curable diseases incidental to the country (California), pneumonia, particularly in the acute stage, I have found it more efficacious than any remedy that has heretofore been employed, besides controlling the action of the heart it —
relieves pain and is more decidedly diuretic than even etheolium: affecting of the heart is not so liable to result from the use of this as of benefarin.

In acute pericarditis resulting from exposure in a child seven years of age accompanied by the most violent and aggravated symptoms of that formidable disease the excessive action of the organ was controlled in less than twenty-four hours and the influence of the remedy maintained until the disease entirely disappeared without the aid of any other treatment than external iritation."

2. Special Evidence:
   
   (a) pneumonia

   Case I. (referred by Benjamin E. M.D.)

   A. H. aged 40

   April 1st 1858: he has been sick since 28th ult. taken with chills, general bowels and pains in right side. His pulse was 110 & respiration 25. Ordered powder of calomel and oxide of mercury. 8 o'clock 12 hours afterwards I found him with pulse 152 respiration 32. Complaint very Sallow - eyes looking...
Bloody Sputa - led him to continue the powder and gave the tincture of Veratrum vinicida every two hours.

April 3rd: Had continued freely for two or three hours, pulse 80, respiration 20 - continued the Veratrum.

April 4th: Veratrum vinicida taken irregularly, pulse 96, respiration 20 - ordered ten dropper every two hours.

April 5th: Pulse 60.

April 6th: Pulse 72 - take Veratrum ten dropper every eight hours.

April 7th: Pulse 74.

April 11th: Out of doors - convalescent with rapid recovery.

A blister was applied the fourth day.

The evidence of the sedative power of Veratrum in this case is very incomplete. In the report of the first two days, it being impossible to say whether it was the Antimonial, the Veratrum, or the bleeding, though most probably the latter that produced the lowering action on the pulse or whether the diminution was due to the Antimonial or the Veratrum. On the 3rd April however we start with a pulse of 80 which through negligence in the use of the Veratrum apparently rises to 96 but is reduced by the intelligent use of the remedy to 60 and from that gradually against the normal concurrent with the patient's return to health.
Case II. Reported by R.C. Hodge M.D.

June 5th 1838:

A child four and a half years old was found with a frequent dry cough, hot skin, rapid respiration, furred tongue and a pulse of 140.

R. Calendans q. 4th

To be followed by R. Ricini.

R. T. vest. i.d.i.d. q. 4th

every three hours.

June 6th: Captain's deposition; vomiting this morning.

Pulse 84; cough frequent; respiration slower.

June 7th: Pulse 120. Has not taken veratrum since last evening - resume it.

June 8th: Has vomiting, pulse 60 ordered to. ver. vin.

g.t.i.f. every two hours

June 9th: Pulse 80 - continue veratrum.

June 10th: Pulse 80 - Veratrum continued - from this date the convalescence was rapid. There was no medicine administered after the cathartic by last veratrum.

This case shows remarkably the depurative power of veratrum. The pulse here the pulse twice reduced enormously in one case 50 in the other 60 beats in the minute by the action of the drug passed so as directly affected the system sufficiently produce cureis. Then the pulse is by gradual close
rest at the normal level.
Case III. Reported by R.L. Holcorne M.D.

March 13th, 1858:

Mr. C.—aged 44, has great pain in the right side with frequent cough, dyspnoea and a pulse of 120. Has taken cathartics, ordered leeches to side and the injection of veratrum gtt. v. with 1/16 grain of the sulphate of morphia. He takes every three hours.

March 14th. Pulse 80—pain left

March 15th. A.M. Pulse 100 had slept during the night and omitted the veratrum—ordered to resume it.

P.M. Pulse 60—some nausea but no vomiting—ordered the dr. of veratrum gtt. viij. every four hours and doris powder at night.

March 16th. Pulse 72. Most veratrum.

In this case we have the pulse twice reduced forty beats in the minute, which in the first instance between the 13th & 14th May or may not have been the effect of the veratrum according to the constitution of the Catharact they patient made use of, but in the second case apparently could only have been due to this drug's influence.
Case IV

Reported by the Same.

April 19th, 1858

Mrs. H. aged 84 while recovering from the effects of an extensive suppuration in the right arm, sat yesterday as an open window for half-an-hour and shortly afterwards had a chill with sneezing and coughing. Today she has an urgent cough, a pulse of 104 and expectorinm in the lowest lateral third of the chest.

P. Fr. veraci viridi gtt. iii

Sulp. Morphice gr. 1/6

deg. Amm. acetate 3/6.

To be taken every three hours.

April 20th, 1858: Pulse 82. Troublesome cough. Audible syrinx - omit the Veratrum.

April 21st: Pulse 94. Resume the Veratrum as before.

April 22nd: Pulse 76. Take veratrum viride every four hours.

April 25th: Had diarrhoea after which the cough suddenly ceased.

This case presents the same features as the others - i.e. the constant depression of the pulse by the use of veratrum and its equally constant cure on its omission. Was the diarrhoea an example of the same purgative action of the drug?
Case V. Reported by James Richardson M.D.

Feb. 26th: 1858: Martha C - aged 7 1/2 months was suspected with inflammation of the lungs.

Feb. 27th: With the characteristic symptoms of inflammation I found her pulse 104; took frequent temperatures to the affected region & mixture of veratrum 0.02 for every two hours.

Feb. 28th: 10 A.M. Better in all respects, pulse 125. Continue the same treatment during the day reducing the dose of veratrum to the drachm.

March 1st: Doing well, directed an expectation mixture and one drachm of veratrum every four hours, more frequently of fever emulsion.

March 2nd: Pulse was yesterday 150 but a return to the veratrum, one drachm every hour, brought it down and it has not since risen so high. Continue spectrastant and veratrum, less frequently.

She made a speedy and good recovery.

In this case the only sedative medicine used was the veratrum and by it the pulse was lowered 59 beats in the twelve and was afterwards sustained near the line of health.

The same patient had another attack -
the pulse at first was 150 on the administration
of veratrum it fell to 125 the following day - rose
again to 150 and finally fell to 92 beats in
the minute. But the omission of the veratrum it was
120 and was again reduced by its use to 890
at which it was kept till the patient got well
and made a good recovery.

Case VI: (reported by Dr. Geo. D. Loring ofStyleSheet)

About a year since I was an attendance upon a
gentleman - aged about 40 years - as ill with
meningitis. The patient was frightened and phthisis
and had for some time been in poor health. Pulse
125. Treatment: four drops of Selden's extract of veratrum
winds increased 8 to 9 by repeating the dose once or
four hours, with coughing. I was suddenly trans-
muted in the night as more than twenty-four hours
after beginning the treatment to see the patient who
with his attendant was much alarmed with the
symptoms observed. I found my patient as I had
anticipated in reality much improved - for, though
there had been some retching and attempts at
vomiting and the man thought himself dying
there was no occasion for alarm. The pulse had
fallen to 75 or 80 beats a minute and the respiration was improved. The patient could not be induced to follow the treatment and the pulse rose to 100 but the severity of the attack was materially abated from that time and the patient recovered his usual health.

This case illustrates, in addition to the power over the arterial system that the remedy possesses, what seems to be one of the disadvantages of belladonna viz. the extreme amount of the depression which is apt to be unexpectedly produced and the consequent alarm on the part of the patient who "could not be induced to follow out the treatment" a very disagreeable result for the practitioner.

Special Evidence

(b) Rheumatism

Case VII. Reported by Alfred Ashley M.D.

May 20th 1888: "A young man about eighteen; symptoms "simulating acute pleurisy in lower part of right thorax; "obtained some peace to the part, two grains of oaks powder "at bedtime and eight doses of the tincture of belladonna "every two hours."
May 21st A.M. Passed a restless night - symptoms same as night before; pulse 100; ordered to continue the "Vermiflum".

P.M. Pain much diminished - vomiting - pulse 90. Suspended all medicine for the night.

May 22nd Pulse again at 100. Pain entirely left the chest but knees and ankles swell, and painful. Continue the Vermiflum, eight drops in combination with twenty drops of urine ether, every three hours.

May 23rd Pulse 72. Pain and transfixion left - continue the Vermiflum.

May 24th Much improved.

May 25th Vermiflum has been given occasionally the last twenty-four hours - the pulse now 72. Pain is still severe in the joints of the toes but has entirely left them elsewhere and there is appearance of a speedy recovery.

Dr. Chaplin further remarks:

"The patient had on a former occasion suffered much from hypertrophy of the heart, and there was difficulty in controlling the excessive action. During the present instance the heart became at once tumultuous when the Vermiflum was omitted. Its assumption served very soon to restore quiet. I consider the Vermiflum as performing additional..."
"Value in this case on account of the cardiac complication."

Case VIII Reported by Mr. Ruggles, M.D.

May 14th 1858. Patient, a young man nineteen years of age, in bed with intense pain in the right foot, which is somewhat swollen and back-extended on ice and warm anklet. Pulse 106 rather full and "hard, exposed to the air previously while in indifferent health.

Diagnosis: acute inflammation.

Treatment: Tincture beanti viridi gtt X every two hours and cold water dipping of foot.

By the afternoon left foot becoming affected as acceleration of symptoms generally.

Dr. vent. vi. gtt X. every two hours & water dipping.

11 P.M. after the third dose as above vomiting took place - pulse 94 full and soft. No medicine til morning of May 15th. Patient is comparatively free from pain but there is still much, knees beginning the affected. Pulse 102. Ordered ten drops of Dr. verani bism.

as before. The fourth dose caused vomiting and in the evening the pulse was 86, the stools and
"Pain subsiding.

May 16th. The lips, shoulders and wrists affected slightly.
The patient took five doses of the tincture of
veratrum every two hours from this date (Sunday).
Till Thursday prolonging the intervals up to 8 or 9.
To omit the medicine altogether. On Friday he
improved and was downstairs, free from pain except
and swelling. Has been well since.

I have selected the preceding cases from a recap published
as the result of the investigations of the Middlesex flood district
Medical Society, and, if we are to place any reliance
whatsoever on the powers of observation and the veracity of
American medical men, I think it can hardly be dis-
puted that these observations sufficiently prove the great
promptness, power and reliability of the drug as an
artificial sedative. The only point wherein the evidence
in question is at variance with this last is the case
reported to me the only one in which evidently serious
effects had been produced than the physician
had at all calculated on. In only two of the whole
number of cases contained in the reports for two years
was there a complaint made of the failure of remedies
to produce the desired effect and in these two cases
there was some doubt expressed as to the proper ad-
ministration of the remedy.

I have had no opportunity of testing its
therapeutic applications, but I have satisfied myself
from experiments on my own person with此前
Aaron varying from four to two drachms that it is
quite possible by its use to reduce the pulse con-
siderably—without nausea, vomiting or any
particular inconvenience.