A series of experiments made upon the dog with several gout nostrums of the present day, and different preparations of colchicum ... to demonstrate the agency of these substances on the animal oeconomy; and to furnish ... conclusions in reference to the employment of colchicum as a medicine in gout / [Charles Scudamore].

#### **Contributors**

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### A SERIES

OF

# EXPERIMENTS,

&c. &c.

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### SERIES OF EXPERIMENTS

MADE UPON

# The Dog

WITH SEVERAL

### GOUT NOSTRUMS

OF THE PRESENT DAY,

AND THE

DIFFERENT PREPARATIONS OF COLCHICUM;

WITH A VIEW TO DEMONSTRATE THE

Agency of these Substances on the Animal Economy;

And to furnish some useful Conclusions in Reference to the Employment of

Colchicum as a Medicine in Gout.

By CHARLES SCUDAMORE, M.D.

&c. &c. &c.

LONDON:

Printed by JOSEPH MALLETT, 59, Wardour Street, Soho.

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BY CHARLES SOUDAMORE, M.D.

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### PREFACE

#### TO THE THIRD EDITION

OF

"A Treatise on Gout, Gravel, and Rheumatism, by "CHARLES SCUDAMORE, M.D." &c. &c. &c.

The additions to the present Treatise are so numerous, and so much interspersed throughout the work, that I have found it impossible to embody them into an Appendix, as I should have been gratified in doing, for the convenience of those who may have purchased either of the former editions. But should another at a future period be required, I fully purpose to publish the work in two volumes, confining the subject of Gout enentirely to the first; and to print a certain number of additional copies of the second volume, for the accommodation which I have stated.

The edition now offered to the public, will be found to contain nearly one third proportion of matter more than the last. The additions consist almost wholly of practical observations and cases; together with a Series of Experiments, chiefly relating to the examination of those Gout Nostrums

which have so long engaged the curiosity of the public, and still give occasion to doubt and discussion, both as to the nature of their properties, and the propriety of their administration. Upon the subjects of Gravel and Rheumatism, I have enlarged as far as my limits would permit; and have endeavoured to furnish some useful materials, although professedly very incomplete.

With respect to the Experiments, notwithstanding that I have already introduced them with some prefatory observations, I shall beg leave in this place also to say a few words. It was at first my intention to have printed the details separately from the Treatise, and to have offered them to the sole attention of the Medical Reader; but, on mature reflection, I considered that they might prove both interesting and useful to the gouty patient, as furnishing some important hints respecting the immediate treatment of his disorder. The recital of animal sufferings, inflicted in the way of experiment, certainly in itself requires some apology; and I should willingly have considered the delicacy and feelings of the general reader, in suppressing many particulars; but as constantly as

I attempted this, I found that I materially diminished the information which I had to offer; and that I could not so satisfactorily shew the grounds of my own conviction, as to the hurtful consequences of employing these medicines, and the importance of deterring gouty persons from resorting to them.

The results of these experiments have proved a great source of instruction to myself; and I will appeal to every one, whether it is not allowable that a medicine of doubtful character should be made to shew its deleterious agency on animals; if, from such means, any decided advantage can be derived to the health and comfort of our fellow creatures.

The high sanction which the use of these pretended specifics has so long received, demanded from me every collateral evidence to support the opposite opinions which I have ventured to maintain. The point for which I most earnestly contend, is, that the administration of gout nostrums, in addition to any hurtful agency which they possess, involves in the treatment completely false principles. It constitutes a practice essentially unsound. If, therefore, my views be just, and I gain the concurrence of the rational and well-informed; — if I assist in establishing a proper and regular mode of treatment for the gout, and thus lessen the amount of human suffering;—and, finally, if I oppose with success the unworthy claims of empiricism, and gain new adherents to the cause of scientific medicine; I shall be contented with my labours, and reflect with satisfaction on their result.

Should the doctrines and opinions which I have advanced be founded in truth, they will stand the test of time and opposition;—if, on the other hand, they originate in error, they must, when submitted to the same ordeal, as inevitably fall.

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#### A SERIES

OF

## EXPERIMENTS,

&c. &c.

Some of my Readers will probably condemn these Experiments upon Animals, as not creditable to humanity; but I beg it may be considered, that this investigation was undertaken solely for the purpose of obtaining information on some important points relative to the health of Man.

It may probably be asked, are these experiments really deserving confidence when their professed object is to compare the effects of medicines upon man and the dog, which are in their economy so differently constituted?

<sup>\*</sup> I must not omit to acknowledge my obligations for the very material assistance afforded me in these Experiments, by Mr. Probart of Great Portland Street; and his brother, Mr. Frederick Probart, a zealous medical student.

I answer, that in the structure and functions of the stomach and alimentary canal, there is a sufficient general similarity for the purpose of these experiments. I offer them only in illustration of the results which I have found on the human subject; and as confirming, but not instituting, my rules of practice. They certainly authorise some positive conclusions as to the properties and strength of the different preparations of which I have treated, being fairly comparative; they set forth their mode of action upon the animal system; and shew the nature of the symptoms by which death is produced, when the medicines are administered in the fatal dose.

EXPERIMENT 1.—Eau Medicinale.—One hundred and sixty drops, measuring 135 minims, of eau medicinale, were injected into the jugular vein of a full-sized very strong dog, at a quarter before one p. m.

He immediately ran about, apparently not affected. In ten minutes the pulse\* was 100, and irregular; in a quarter of an hour he sat on his hind legs, licking his wound and looking sleepy and slightly languid; he soon after walked steadily. In three-quarters of an hour he ran about without particular inconvenience, still however

<sup>\*</sup> In the early part of these experiments, I did not make a previous examination of the pulse, considering that its average frequency in dogs was 140 in a minute. Afterwards, however, directing my attention to this point, I discovered a great variation both as to the frequency and regularity of the pulse of the dog in his healthy state. This variation in different dogs was from 120 to 180; and if the animal became at all alarmed, the pulse would not only become very frequent, but in several instances intermittent. As far as I have been able to ascertain, the average number of inspirations in the healthy dog may be stated at 36 in the minute.

having the sleepy look. The pulse intermitted after every five beats, and was 90 in the minute.

In an hour and three-quarters, the dog was evidently much disordered; had no disposition to move; and the drowsiness was increasing. He had vomited twice, bringing up a glutinous matter of a greenish yellow colour, and had two dark alvine discharges. In four hours, a discharge of yellow-coloured viscid mucus flowed from the mouth. He exhibited great lassitude; the eyes were dull; and, when left alone, he seemed heavy and lethargic; the pulse was 94; and the inspirations were natural.

In five hours and a half, he was sitting up, but looking exceedingly dejected; his pulse was 69, and irregular; the inspirations were 24.

In six hours and a half, the inspirations were not apparently difficult, and 20 in the minute; his eyes closed; he appeared sound asleep. In seven hours and a half, he had changed his situation, and was lying with the head erect, endeavouring to swallow some drink placed near him. In a few minutes he vomited a clear liquid, stood erect, appeared relieved, and drank freely of some water: the pulse was 90, and intermitted at every three or four beats.

In eleven hours, the inspirations were only 18; and the dog was manifestly worse in all respects.

The following morning, at eight o'clock, he was found with his head reclining on the ground. On moving and trying to place him upon his legs, he was wholly unable to support himself, and instantly sunk down on the straw. The inspirations were quick, irregular, and difficult.

Nine o'clock.—The breathing was harder; snd every 15 or 20 seconds the whole body was violently convulsed.

Half-past nine.—Continually convulsed, and still more violently; and he was much distressed.

At ten o'clock the convulsions had ceased; and the animal lay extended and moaning.

Eleven o'clock.—Life appeared to be almost extinct: a large quantity of thick, bloody mucus was observed near him; his inspirations were 14 in a minute; a quantity of saliva flowed from his mouth. In a quarter of an hour, his inspirations were but 12. In another quarter of an hour they were only 10. He was now and then convulsed.

Three o'clock.—Throughout the morning he was in a state of complete insensibility; his eyes were now fixed, and the eyelids shut; the teeth were firmly closed, and all power of voluntary motion was lost. The inspirations were increased to 26 in the minute.

At four o'clock he had expired.

Appearances on Dissection.—On the following morning the body was opened. The stomach exhibited slight appearances of incipient gangrene; the duodenum and jejunum were highly inflamed; the ilium, colon, and cæcum, less; and a small spot of ulceration was seen at the commencement of the rectum. The internal coat of this and of the other intestines, through their whole course, was here and there marked with deep rose-coloured spots, about the size of a pea. The auricles and ventricles of the heart, and the vena cava, were much distended with black blood, partially coagulated; the gall-bladder was filled with bile.

Exp. 2.—Wilson's Tincture.—One hundred and sixty drops of this medicine were injected into the jugular vein of a mongrel dog, the size of a large terrier. He became languid in a few minutes, and a slight convulsion

of the muscles of the thighs was observed. In half an hour he voided some urine. In little more than an hour, the symptoms were more favourable. In an hour and a half, he seemed so much recovered as to be capable of running many yards, and up a pair of stairs. In three hours, he was discovered to be in a sound sleep. Some greenish yellow mucus appeared around the mouth. In five hours, he ran about from place to place as if restless, and appeared debilitated. In seven hours and a quarter, we were much surprised to find that he had expired. This dog lost six ounces of blood in the operation. There was a small sediment in the bottle of the tincture, which was shaken up, and injected with the fluid.

Dissection.--The œsophagus appeared in a natural state. The whole surface of the stomach exhibited marks of inflammation, and the mucous membrane, towards the pylorus, was almost gangrenous; the stomach contained bile and mucus; the duodenum, near the stomach, was much inflamed; the other portion but slightly. The jejunum, at its commencement, was highly inflamed, and covered with an abundance of coagulated albumen. The inflammation extended through the whole course of the jejunum and ilium, but gradually diminished. In the colon the appearances of inflammation increased; the cœcum was slightly inflamed; and the rugæ of the rectum exhibited numerous red points. The lungs bore slight appearances of inflammation; the liver was partially inflamed; the urinary bladder was much contracted; the brain was in a natural state.

Exp. 3.—Reynolds' Specific.—At twenty minutes past one p. m. a hundred and eighty drops of this tincture, measuring two drachms, were injected into the jugular vein of a young mongrel dog. He passed at the moment a natural alvine discharge. At three o'clock he had

vomited a large quantity of mucus, tinged with bile; the inspirations were hurried and performed with difficulty, and were 62 in the minute; he hung down his head, and there was universal tremor.

At four o'clock he was making ineffectual attempts to vomit; looked miserably dejected, and stood with difficulty.

Six o'clock.—He was sitting up, but much enfeebled; the inspirations were 28 in the minute.

Seven o'clock.—It did not appear that he was suffering any pain; he was lethargic, and indifferent at having his head raised by the ear, or being in any way disturbed; his inspirations were now apparently free from distress, and 36 in the minute.

At nine o'clock he was found dead; a white jelly-like substance appeared to have passed from the rectum.

Dissection.—The stomach was highly inflamed, and completely distended with grumous blood; the inflammation had extended with great violence through the intestines, as far as the rectum, which was slightly inflamed and abundantly marked with deep rose-coloured spots of the size of a pea. An ounce of colourless limpid fluid was found in the chest; the gall-bladder was much distended; the blood in the auricles, ventricles, and veins, was black and coagulated.

Exp. 4.—Hellebore and Laudanum.—One hundred and sixty drops of this mixture, in the proportions recommended by Mr. Moore\*, were injected into the jugular vein of a large dog.

He was instantly motionless and insensible, and to all appearance dead. In six minutes respiration was perceptible, but extremely quick and difficult; he attempted ineffectually to vomit. In ten minutes the pulse was 90. In half an hour, he passed an involuntary loose discharge of mucus, tinged with blood, and some blood was observed to come from the mouth; the breathing was convulsive and extremely difficult. In three-quarters of an hour his inspirations were only six in a minute, and very deep; the whole body was drawn up, and exhibited emprosthotonos. In two hours the symptoms were abated; the respiration was much easier, and there was no longer any convulsion. In two hours and a half, he was still better and capable of sitting up. In four hours and a half, there was a further improvement in his appearance; and he walked many yards with facility. In six hours, he was found upon his legs, much recovered; his eyes were bright, and no other symptom appeared than debility. In eight hours, the ligature had given way, and the wound was bleeding freely. On the following morning he was running about, and had a good appetite. There had been several alvine discharges during the night and throughout this day. The next and third day, he was quite well.

Exp. 5.—Hellebore and Laudanum.—The last experiment was repeated; and one hundred and sixty drops were injected into the jugular vein of a good-sized strong female dog. The operation was instantly followed by emprosthotonos, and a spontaneous liquid alvine discharge; the limbs were convulsed; the pulse was 116, and irregular.

In six minutes the convulsions were general; the animal made ineffectual attempts to vomit; the inspirations were laboured and very deep, and only eight in the minute.

In sixteen minutes they were so rapid, that they could not be counted, with occasional intermissions. In eighteen

minutes she was found moaning. The inspirations, in three minutes after, were only 3; the pulse was 100 in the minute. In an hour, she passed another very copious discharge; the pulse was regular; there was abundant salivation, and she appeared much better. She occasionally uttered cries; now rose upon her legs, staggered a few paces, and fell. In two hours, the tongue was protruded, and saliva flowed from her mouth; the body was slightly convulsed, and the respiration was laborious. In half an hour, the convulsions became frequent; the respiration as before; there was occasional whining. In three hours and a half she was sensible, and appearing to recover; but, as yet, incapable of supporting herself. The inspirations were irregular and difficult; the tongue still protruded; the eyes were open and bright; but she started and seemed terrified at the light of a lamp. In four hours and a half, she was sitting on her haunches, but was incapable of keeping this posture for any length of time. She was breathing slow but freely; she no longer shrunk from the light, and appeared to be recovering. In five hours and a half, her strength was returning, and she was in every respect better. In six hours and a half, her appearance exhibited complete paralysis of the hind extremities. She seemed quite sensible, and looked very animated. On the following morning she appeared well, and ran about without any inconvenience whatever.

Dissection.—In the course of the day, this animal was destroyed for the purpose of ascertaining what internal lesion of structure had resulted from the experiment.

The whole viscera were found healthy except the lungs, which here and there presented livid spots. The auricles of the heart, and the vena cava thoracica, were filled with very black and firmly coagulated blood.

elaterium and sixty drops of laudanum (forty minims\*) with about a drachm of water, were injected into the jugular vein of a middle-sized terrier.

He instantly lost all power of motion, and was quite insensible and lethargic. In twenty minutes he had a natural alvine discharge; he was much convulsed; the pulse could not be counted. In rather more than an hour, he was sensible to pain on being pinched; was still much convulsed, and continued lethargic when left to himself. In three hours, there was no farther remarkable change. In five hours and a half, there was excessive languor, and he was still insensible. In seven hours, he seemed to suffer great pain, moaning continually, but insensible to any object near him; his eyes were closed and fixed, and the teeth were closed; there was a convulsive motion of the hind leg; the inspirations were sixty in a minute. In little more than eight hours he was visited again, but there did not appear any remarkable change. He died during the night.

Dissection.—The left lung presented the appearance of inflammation; the right was also inflamed, but in a much less degree; there was a very partial inflammation of the left lobe of the liver. The whole surface of the stomach was slightly inflamed; the inflammation extending with increased violence through the duodenum and jejunum, and into the ilium, which was much contracted; and here also the inflammation was still more strongly marked. The brain had a healthy appearance.

Exp. 7.—Sir Everard Home's Vinous Infusion of Colchicum.—One hundred and sixty drops of the vinous in-

<sup>\*</sup> See p. 196.

fusion of colchicum, prepared according to the directions of Sir Everard Home\* (procured from Fisher's), measuring two drachms, were injected into the jugular vein of a strong dog. For the first fifteen minutes he did not seem to suffer the least inconvenience. In an hour and a quarter, he was sitting on his hind legs; the eyes were bright, and there did not appear any remarkable change. In five hours he was still capable of sitting up, but appeared much dejected; and there was some difficulty of breathing, attended with an occasional husky cough. His pulse was 113; the inspirations were 56. In five hours and a quarter, he vomited some bloody mucus, and expired.

Dissection.—The stomach was in a state of gangrene; the duodenum, jejunum, and ilium were in a high state of inflammation, approaching to gangrene. About two ounces of highly offensive grumous blood were found in the stomach; there was also blood in the duodenum, but not offensive. The colon, cæcum, and rectum were much inflamed; with, here and there, deep rose-coloured spots of the size of a pea. One ounce and a half of fluid was taken out of the cavity of the chest. The arteries contained very little blood. The veins, auricles, and ventricles were much distended with blood of a purplish black colour, not coagulated. The bladder was nearly full of urine of a deep saffron colour; and the gall bladder was much distended with bile. There was an effusion of bile upon the liver.

Exp. 8.—Tincture of Colchicum.—At one p. m. one hundred and sixty drops of this tincture were injected into the jugular vein of a mixed terrier of middle size.

<sup>\*</sup> See p. 195.

On being immediately loosed, he staggered considerably, and fell down a pair of stairs.

Forty minutes past one.-He foamed at the mouth.

Two o'clock .- He was languid and lethargic.

Four o'clock.—Extremely lethargic; and a tremulous motion pervading the whole body.

Six o'clock.—He remained much in the same state, except that his inspirations were deeper, and only twelve in the minute.

Seven o'clock.—The inspirations were only ten in a minute; the eyes were fixed; the teeth firmly closed; and he was to all appearance dying.

At nine o'clock he had expired.

Dissection.—The heart presented the most extreme appearances of inflammation, looking even black and gangrenous. There were about two drachms of water in the pericardium; the stomach was slightly inflamed; the inflammation increasing in the duodenum, and extending in a slighter degree as far as the rectum; the bladder was distended with urine.

Exp. 9.—Expressed Juice of the fresh Roots of Colchicum.—At 40 minutes past one o'clock p. m. a hundred and twenty drops of the expressed juice of the fresh roots of colchicum were injected into the jugular vein of a young terrier. There was immediate prostration of strength; he passed a natural alvine discharge.

In two minutes he vomited about half an ounce of frothy bile of a gamboge colour. Rising upon his legs, he staggered as if intoxicated, and immediately fell. In five minutes the respirations were 52. In seven, the eyes were fixed; the pupils contracted; the hind extremities were stiff and drawn up. In ten minutes he was upon his legs, passed a scanty bilious discharge, walked about, and

soon again made great efforts, without effect, to relieve himself; uttering at the time a plaintive cry. He ran into a dark part of the room. On lying down, he had some rigors, and there was a profuse salivation.

Three o'clock .- He was on his legs, with his back raised, and shewing signs of distress in the bowels. The inspirations were 42; he was capable of walking, but seemed very languid.

At four o'clock the lassitude had increased, and he supported himself with difficulty on his legs; a copious discharge of mucus or saliva was proceeding from the mouth.

A little before five, he appeared to be suffering much; was moaning continually, and took no notice on being disturbed.

At six o'clock, he still mouned at every inspiration, and these were only twelve in the minute; the eyes were fixed, the teeth firmly closed, and he appeared to be dying.

At seven o'clock there was no perceptible change, except that his inspirations had increased to 14 in the minute.

Nine o'clock .- He respired only 8 times in the minute, and this with difficulty. His moaning was much fainter.

Ten o'clock .- He was found to have expired, and was quite cold.

Dissection .- The stomach was highly inflamed, containing about an ounce of dense mucus, mixed with grumous blood; the duodenum, jejunum, and ilium were highly inflamed; the inflammation decreasing in the colon, cæcum, and rectum. The whole intestines were lined with coagulated lymph. The blood found in the auricles and ventricles of the heart was fluid, and very black; the gall-bladder was much distended with bile.

Exp. 10.—Acetum Colchici.—Three fluid drachms of the acetic preparation of colchicum, neutralised by carbonate of ammonia, were injected into the jugular vein of a terrier dog of middle size.

In three quarters of an hour he seemed languid, and trembled a good deal, but was capable of running about. In three hours he exhibited great lassitude; the pulse was 108, and irregular. In five hours and a quarter, on our trying to ascertain his pulse and other symptoms, he started off, as if quite well. In another hour, he was seemingly free from pain. Soon after, the eyes were bright and open. In ten hours, he appeared tolerably well.

On the following morning, at eight o'clock, he appeared quite recovered; looked lively; and was sitting on his haunches. There was no disposition, however, to move; he looked frightened. At six in the evening, he was found in the same state. He had throughout the day assumed a sullenness of aspect; had not moved from the spot where he was left last night; refused both meat and drink; but had still a lively eye, and did not seem so much inconvenienced by the medicine, as alarmed by the operation.

On the following day he had all the character which appeared yesterday. In the course of this day he passed numerous alvine evacuations, and also urine very freely. He gradually recovered.

#### EXPERIMENTS BY THE MOUTH.

Exp. 11.—Eau Medicinale, with the Sediment which it forms, shaken up.—At half-past ten a.m. eighty drops (by measure, sixty minims) were given to a large and very strong rough terrier.

Two o'clock.—He was lying down, and looked lethargic.

Half-past four.—Pulse 95, vibrating and intermitting every five beats.

Eight o'clock.—The pulse was softer; he had vomited some frothy mucus, and appeared very languid.

Next morning.—Pulse 164, and irregular. The dog had recovered his strength.

Ten o'clock.—A further dose of 160 drops was given.
Half-past two.—He looked dejected; the pulse was
104, and very irregular.

Four o'clock.—Had brought up some opaque viscid mucus.

Six o'clock.—Had vomited a quantity of frothy slime, mixed with blood, and appeared very seriously ill. Rigors; the pulse was 80, and small, with intermissions after every five or six beats.

Half-past nine.—Seemed dull and languid; the pulse was 106.

On the following morning, at ten o'clock, he was found extended on the ground; had voided a quantity of urine; he was quite insensible, and now and then stretching out his limbs, and was much distressed; his inspirations were six in the minute.

At one o'clock the moaning had ceased.

Half-past two.—He was stretching himself out, as if in the act of dying. There were slight convulsions of one of the legs. The pulsation of the heart was not to be felt; and no distinct respiration could be observed.

At three o'clock he had expired.

Dissection.—The stomach was highly inflamed, and contained a dark-brown fluid; the marks of inflammation increased in the duodenum, and through the jejunum—decreased in the ilium, and increased again in the colon,

which appeared in a state of general ecchymosis from venous blood extravasated under the mucous membrane. The cœcum and rectum were slightly inflamed.

Exp. 12.—Expressed Juice of Colchicum, followed by Eau Medicinale, clear and turbid.—Monday, at half-past twelve p. m. two fluid drachms of the expressed juice were given to a very powerful, lively dog, of the rough terrier kind.

Half-past two. — He was lying down, trembling; the pulse 108.

Four o'clock.—Looked dejected; had been making attempts to vomit.

Six o'clock.—Extremely languid and dull; pulse 180; had passed an alvine discharge, which was mixed with mucus, and of a putrid appearance.

Half-past nine.—There was increased lassitude, and the animal could not stand; pulse 160.

Tuesday morning.—Appearances much the same as last night; refused to eat.

One o'clock.—Continued very languid; the skin hot; the pulse feeble, and 184 in the minute.

Half-past two.—There was no change.

Five o'clock.—Appeared exceedingly dull, and staggered when put upon his legs; the pulse 166.

Eleven o'clock.—Pulse 186; no further change.

Wednesday morning, eleven o'clock; the pulse 200, and very small; he appeared better. At twelve, he passed a watery alvine discharge; was thirsty, and drank freely of water.—At half-past twelve, the dog took a second dose of two drachms of the expressed juice.—At two o'clock was very ill; the pulse 186; the inspirations 18.—Five o'clock. He continued languid and dull; the pulse was 180.

Eight o'clock: the pulse too feeble to be counted; he looked more ill.—Eleven o'clock: the pulse was only 90; he looked better, and drank some water.

Thursday morning.—He appeared to be recovering; the pulse was 100. He continued to mend through the day; and towards evening ate very heartily, but was still dull. In the course of the day he passed a considerable number of bloody discharges, which had the worst appearance.

Friday morning.—The dog still looked dull; but was stronger, and had mended considerably. He ate heartily; and during the day had more of the discharges before described.

Saturday.—Had still the heavy look; and, though he ate with good appetite, yet appeared under the influence of the medicine; the pulse was 166.

Sunday morning.—He was looking much better, was more lively, and running about; the pulse was 168.

Monday morning.—Appeared quite well; he ate heartily, and appeared in very good spirits.

Tuesday morning.—At ten o'clock, this dog being perfectly recovered, sixty minims of eau medicinale, filtered so as to be quite transparent, were given; his pulse then being 180, and regular.

At half-past twelve, no apparent change had taken place, except in the pulse, which was 168, and regular.

Half-past two.—No alteration.

Half-past four.—The pulse, and appearance of the animal were the same. He continued quite well throughout the evening, and without any variation in the pulse; ate with the best appetite, and was in excellent spirits.

Wednesday morning.—He was perfectly well; the pulse was strong, and 180.

Twelve o'clock .- He took a further dose of two fluid

drachms of the clear eau medicinale. In a few minutes he had two loose discharges, differing in appearance; the one being of a dark bilious colour; the other of a clay appearance, and intermixed with slime.

Two o'clock .- The pulse was 174; no other change.

Three o'clock.—He looked lively, and there was no visible alteration; the pulse was 160, and regular.

Half-past four.—His spirits were not so good; there was no desire to move; but the pulse remained unaltered.

Eight o'clock.—He had passed several bloody and highly offensive discharges; looked very dejected, and his pulse was 156.—Half-past nine: great reluctance in moving.—Eleven o'clock: no change.

Thursday morning.—Looked better; was lively and playful; the pulse was 168; he would not eat. Continued to improve throughout the day; and at eleven p. m. the pulse was 168, and regular.

Friday morning .- Appeared quite well; the pulse

was 160.

On the following Monday, at eleven a. m. the dog having completely recovered his strength, and being in the best spirits, was made to swallow a bottle (two fluid drachms) of eau medicinale with the sediment shaken up; the pulse being 168.—One o'clock: the pulse was 192; but he did not appear at all affected.

At half-past three, he threw up some undigested food; looked less lively; and the pulse was more feeble, but still 192.

Six o'clock.—The pulse was 168; weak and irregular.

Ten o'clock.—Had passed some discharges tinged with blood; and a considerable quantity of undigested food had been ejected from the stomach, mixed with mucus and tinged with blood; he looked dull.

Tuesday morning .- Had passed several bloody dis-

charges of the description before mentioned; his strength did not seem much impaired; but the pulse was very weak, and 180.

Three o'clock.—The pulse not altered; his appearance was improved, but there was no appetite.—Sixty minims more of turbid eau medicinale were now given.

Six o'clock.—The pulse was 166, and very weak; the animal looked dull.—Eight o'clock: no change.

Eleven o'clock.—The pulse and appearance the same.

Wednesday morning.—His appearance was most unfavourable; he looked dejected; was much debilitated; and his pulse so feeble and fluttering that it could not be counted.

Three o'clock.—He was altered for the worse; the pulsations of the heart were scarcely to be distinguished; he had voided some liquid bloody discharges.

At six o'clock, the pulsations of the heart could not be felt; the inspirations were only eight in the minute; all power of motion was lost, and he appeared to be almost dead; his extremities being quite cold, and the body extended on the ground.

Seven o'clock.—He was still living, but the inspirations were only four in the minute; and he was completely insensible.—Eight o'clock: he had expired.

Dissection.—The stomach contained a quantity of bloody fluid, and was in a state of gangrene. The duodenum, jejunum, and ilium were much inflamed, and here and there marked with livid spots. The inflammation increased in the colon and cæcum, and was still greater in the rectum. The auricles and ventricles contained black fluid blood; the liver and lungs appeared healthy.

Exp. 13.—Eau Medicinale in the transparent state, followed by the Tincture of Colchicum.—Ninety drops, measuring sixty minims, of eau medicinale, filtered and

quite transparent, were given at ten o'clock a. m. to a strong terrier dog.

At two o'clock he was found vomiting a quantity of thin transparent mucus; the pulse was 150.

Half past three.—He had vomited more mucus; and looked rather languid.

Half past four .- Had again vomited mucus,

Eight o'clock.-More frothy mucus from the mouth.

On the following morning, it appeared that he had in the night passed a quantity of liquid alvine discharge, tinged with blood, and mixed with mucus; the pulse was 168, and irregular.

Half past two.—His looks were dejected; the pulse was 104, and very irregular.

Four o'clock.—Had vomited some dark viscid mucus. Six o'clock.—He had brought up a quantity of frothy slime mixed with blood; seemed greatly affected; had rigors; the pulse was 80 and small, with an intermission at every fifth or sixth beat.

Half past nine.—The pulse was 106; he looked dull and languid.

On the following morning he appeared quite recovered.

The next day, at half past twelve, six drachms of the tincture of colchicum\*, of the shops, were given to this dog; he soon became languid, and looked exceedingly heavy and dejected.

At two o'clock he was very ill; the pulse was 96; the inspirations were laboured, and only 24 in the minute. There was a copious discharge of viscid mucus from the mouth.

At five o'clock the pulse was 120, and small; the breath-

<sup>\*</sup> Prepared in the proportion of four ounces of the dried roots to a pint of proof spirit.

ing was laborious; and he appeared to be in pain. He shewed distress on pressure of the bowels.

Eight o'clock.—Moaning, as if suffering pain; the inspirations were 48 in a minute, and were quick and difficult.—Eleven o'clock: the pulse was extremely small, and 180; he still appeared to be in great pain, and very languid; he was uneasy, more particularly on pressure being made on the sides of the abdomen.

On the ensuing morning he was found dead and quite cold.

Dissection.—The stomach was much inflamed, as was also the œsophagus, and the whole of the intestines. The inflammation was most marked in the jejunum and colon; the cœcum and rectum were also inflamed, and interspersed with venous ecchymosis. The bladder was contracted; the gall-bladder was much distended with bile; the stomach contained grumous and offensive bloody serum; a layer of coagulable lymph covered the internal surface of the large intestines very generally.

Exp. 14.—Wilson's Tincture.—At half past one p.m. two fluid drachms were given to a common-sized terrier.

At half past two he looked languid; the pulse was 107, and irregular.

Four o'clock.—The lassitude had increased.

Six o'clock.—He had thrown up some frothy mucus; the pulse was 120.

Half past nine.—He appeared better; the pulse was 140, and soft, but rather irregular.

The next morning he was on his legs, and looked much better, but refused to eat.

At eleven o'clock he appeared altered for the worse. One o'clock.—The pulse was 180 and very hard; he looked very languid, and still refused to eat. Five o'clock.—The pulse was 90; the animal appeared more dejected.

Eleven o'clock .- Excessive lassitude; the pulse 86.

The following morning he was much better; the pulse 164, and regular, but hard.

At twelve, a second dose of four fluid drachms of this tincture was given to him.

At two, he appeared exceedingly ill, was very sick, and had brought up a small quantity of mucus tinged with bile; pulse 180.

Five o'clock.—The pulse 170, and small; he moaned on pressure being made upon the abdomen.

Eight o'clock.—The pulse 160, and very languid; he was suffering great pain.

Eleven o'clock.—The pulse 80; the animal was incapable of standing; the respiration was slow and very laborions. The next morning he was found dead.

Dissection.—The stomach was highly inflamed. Inflammation also appeared throughout the intestines, and particularly in the colon. The stomach contained a brownish fluid; and the ilium, some offensive bloody serum. The bladder was distended with urine. There were livid spots distributed on the surface of the lungs; the gall-bladder was distended with bile.

Exp. 15.—Reynolds' Specific.—At eight a.m. four fluid drachms were given to a strong lively terrier, of middle size; his pulse was 160, and very regular.—Ten o'clock: he had thrice vomited some frothy mucus; looked rather dull, and trembled universally; the pulse was become more feeble and indistinct.—Eleven o'clock: he had again twice vomited more matter of the above description.—Twelve o'clock: this had again happened three times, together with two or three alvine discharges, one

of which was slightly streaked with blood; the animal looked very dejected.—Half past 2 o'clock: his pulse was fluttering, feeble, and 182; there was another bloody alvine discharge.—Six o'clock: his pulse was 216; there was great debility, and occasional moaning; he loathed food.—Ten o'clock: no discharge; his pulse was 200; and the animal still looked very dejected.

Tuesday morning.—His pulse was 160, hard and fluttering; he had passed in the night two very bloody discharges; his appearance was improved; but he refused meat.—At 8 o'clock, two drachms more of the specific were given to him.—Ten o'clock; he passed a copious liquid discharge, almost the whole of which appeared like blood; his pulse very feeble, and 186.—Twelve o'clock: vomited the same description of matter as yesterday three or four times; the pulse 192.—Five o'clock: he seemed better; the pulse was now 172, and regular.

Tuesday p. m. 10 o'clock.—The pulse was 192, very feeble and regular; the dog appeared restless.

Wednesday morning.—He was better, but still very dejected and hanging down his head; the pulse was 192, feeble and regular. He continued to mend throughout the day, but never so far as to take food.—Seven o'clock: half a bottle more of the specific was given to him.— Eleven o'clock: he was very dull; there was no further change, nor any evacuation.

Thursday morning.—He had been very sick in the night, bringing up a quantity of bright bilious coloured frothy mucus; the pulse was very feeble, and 192.—Two o'clock: had passed two small bloody discharges, was very ill, and loathed food; he continued in this state throughout the day, the pulse remaining the same.

Friday morning, half past two o'clock.—His pulse was so feeble as scarcely to be distinguished; the breathing laborious and slow.

Saturday, eleven a.m. the dog much recovered, and his pulse 168. He took a further dose of five drachms. Four o'clock: the inspirations were not more than 12 in a minute; the pulse not to be felt. There was an involuntary discharge of bloody liquid matter from the rectum, and of bile from the stomach.—Six o'clock: he was found dead.

Dissection.—The stomach was distended with air, and contained some offensive bloody fluid; the mucous membrane was in the highest state of inflammation, which extended throughout the intestines as far as the colon, this being in a state of gangrene: there was an introsusception of the colon and ilium into the cæcum, which was gangrenous: the intestines contained a quantity of the same fluid as was found in the stomach. The right ventricle was distended with black coagulated blood; the left was contracted, as also both auricles. The appearance of the brain was healthy.

Exp. 16.—Vinous Tinctures of Hellebore and Opium.
—Sixty minims of this mixture, in the proportions mentioned at p. 196, were given to a fine setter dog, on Monday, at 20 minutes past twelve. There was no change in the animal till after 4 o'clock; his pulse was then only 98, and intermittent.—Six o'clock: the pulse was 80, and intermittent.—Eight o'clock: the pulse intermitted after every 5 beats, and was hard, vibrating, and irregular.

Tuesday morning.—The pulse 92, irregular and intermitting: 160 drops of the same mixture were given to him at 10 o'clock; he immediately discharged from his mouth an abundance of frothy saliva.—Half past 20'clock: he had an appetite; the pulse was then 76, intermitting every 3 beats, and very hard.—Six o'clock: the pulse was 108, and the dog appeared lively.—Ten o'clock: the pulse was 108.

Monday .- He looked quite well .- Eleven o'clock: half

an ounce more was given to him; the pulse was 120, and intermitting after every 5 beats; the same appearances followed this dose as the last; if at all different they were less remarkable, and he ate some food a few minutes after.—One o'clock: his pulse was 90, very irregular, and intermitting; in other respects he looked well, and at half-past two he made a hearty meal.—Five o'clock: he appeared dull; the pulse was 80, softer and still intermitting.—Eleven o'clock: the pulse was 79, vibrating and intermittent.

Tuesday morning, eleven o'clock: his pulse was 104, and very irregular, but the animal appeared quite recovered.—Twelve o'clock: he took six drachms of the tincture of hellebore; its action upon the salivary glands was instantaneous and profuse, the animal throwing out large quantities of frothy viscid saliva in all directions.—Two o'clock: his pulse was 76, irregular and intermittent. This dog appeared better towards evening, but having made his escape at dusk, the result of the experiment could not be ascertained.

Exp. 17.—Tincture of Digitalis, followed by Laudanum and Elaterium.—At half past 1 p.m. 40 minims of tincture of digitalis were given to a terrier dog of middling size; there was immediately a copious foaming at the mouth.—Half past 2 o'clock: a great flow of saliva; he was staggering and looked very dull; the pulse was 125, and irregular.—Four o'clock: he was much better.—Six o'clock: looked stupid, and was extremely feeble; the pulse was 104, and very irregular.

Monday.—He appeared quite well. At 12 o'clock 40 minims of laudanum and 4 grains of elaterium were given to him.—One o'clock: the pulse was 228.—Half-past two o'clock: had vomited some thick mucus mixed with bile, and there was reason to believe that the medicine was also

discharged from the stomach; he ate freely of meat.—Five o'clock: the pulse was 180.—Eleven o'clock: the pulse was 190; he had vomited a quantity of undigested food.

Tuesday morning, 11 o'clock: his pulse was 200, and regular; he appeared recovered.—One o'clock: five drachms of the tincture of digitalis were given to him; this instantly produced a flow of viscid frothy mucus, and he made many attempts to vomit.—Two o'clock: he had vomited some undigested food mixed with mucus, and which appeared coloured with the tincture; the pulse was 186, and irregular; there continued an abundant discharge of viscid mucus from the mouth.—Five o'clock: pulse 200; respiration quick and laboured; he had vomited more mucus tinged with blood; great lassitude.—Eight o'clock: the pulse was feeble and rapid, beating 210; the animal made continual attempts to vomit.—Eleven o'clock: the pulse was 200: there were incessant attempts to vomit; the respiration was very quick.

Wednesday.—Was much better; the pulse 160; towards evening he had an appetite for food, of which he ate freely; there was a constant dry cough, attended with an effort, as if endeavouring to bring something from the throat.

Thursday.—He appeared lively, and had a good appetite, but was much distressed with the cough before mentioned, and his pulse in consequence could not be counted.

Friday.—He had in a great measure recovered his looks; the cough was better and the appetite natural; the pulse varied from 150 to 164.

Saturday.—He was lively and still better; the pulse was 168.

Exp. 18.—Want's Gout Remedy.—At two p. m. two of Mr. Want's powders were given to a large mongrel dog. The frequency of his pulse could not be very satisfactorily ascertained, the dog being particularly timid,

and trembling as soon as he was approached.—Six o'clock: his pulse was certainly slower; but he ate with a good appetite, and was not altered in his appearance. Ten o'clock: no alteration.

Friday morning.—His pulse remained the same; the dog appeared quite well. There had been no unnatural discharge, and he ate very heartily. At ten o'clock, two more of the powders were given to him. Two o'clock: he was trembling, and seemed for the first time affected by the experiment. Six o'clock: looked dejected; was still shaking, and refused both meat and drink; no sickness had been produced; the pulse was slow and irregular. Later in the evening, his pulse was quicker, and much more feeble; but there was not any remarkable lassitude.

The following morning, Saturday, it was observed that he had passed several discharges, two of them bloody and of the worst appearance; his pulse was feeble, and occasionally he moaned; he refused food the whole of the day; but towards evening was better, and his pulse became rather stronger.

Sunday morning.—Appeared to be recovering; ate a little meat, and walked steadily and without difficulty: he continued to improve throughout the day, and at night made a tolerable meal. No further trial was made with this medicine.

Exp. 19.—Acetic Preparation of Colchicum.—An ounce, by measure, of this preparation, neutralized by pure magnesia, was given to a large mongrel dog. It produced no visible effect, but his pulse was rather accelerated; he ate and drank freely, and was in good spirits on the following morning

A few days after, at two o'clock, this dog was made to swallow two fluid ounces of acet. colchici, evaporated down to half an ounce, mixed with magnesia. This, like the other dose, did not occasion any change in the appearance of the animal. His pulse did not undergo any alteration, and his strength was in no way apparently affected.

On the following morning it was found that he passed two or three copious discharges; but these were quite free from blood: and his pulse was found to be the same as at the commencement of the experiment.

Exp. 20.—Clear and Turbid Aqueous Decoction of Colchicum.—On Tuesday, at noon, gave to a young dog of mixed breed, two fluid drachms of a clear decoction of colchicum, prepared by boiling two ounces of the fresh root, in a sufficient quantity of water, down to two ounces by measure; his pulse was 132, regular and full.—Halfpast two: the pulse was feeble, irregular, and vibrating.—Six o'clock: there had been no apparent alteration; his pulse, however, was increased to 164; he looked lively, and stood erect without inconvenience.—Eight o'clock: no change.—Eleven o'clock: appearances the same; pulse 156; there had been two discharges, streaked with blood.

Wednesday morning.—He had passed, in the night, two further discharges streaked with blood. He now appeared quite well, eating with great appetite, and in good spirits; the pulse was weak, but regular, and 174.—At half-past one, gave him half an ounce of the same decoction, with its sediment shaken up.—Three o'clock: pulse 180, but so feeble as scarcely to be perceptible; and he looked dull.—Six o'clock: he had brought up a large quantity of undigested food; the pulse was extremely feeble and rapid, being about 240 in the minute. He seemed very weak, but was sensible and apparently free from pain.—Two o'clock: he was greatly debilitated, and again

vomited; the pulse could not be counted.—At eleven o'clock he was scarcely able to stand, and looked very heavy; the pulse still so frequent that it could not be counted.

Thursday morning.—He had lost all power of voluntary motion, and was lying extended on the ground, as if in articulo mortis. There had been an excretion of blood from the rectum, and in the night some more bloody discharges.—At half-past twelve he died.

Dissection.—The stomach was empty, and slightly inflamed. The inflammation was observed in the same degree through the duodenum, jejunum, and commencement of the ilium, increasing towards its termination, and also throughout the colon and cæcum; the rectum was slightly affected; and the left ventricle of the heart contained a small quantity of dark fluid blood.

Exp. 21.—Extract from Eau Medicinale.—Monday, at half-past ten o'clock, two fluid drachms of a mixture of this extract, in the proportion of 5\frac{5}{4} with 100 of fluid, were given to a large spare dog of the mixed breed. The pulse before the experiment was 168, and intermittent.—Twelve o'clock: no change.—Six o'clock: he was looking dejected, and loathed food; there had been no sickness nor unusual evacuations; the pulse was rather slower, harder, and more regular.—Ten o'clock: he had vomited some half-digested food, and had passed an alvine discharge.

Tuesday morning.—His pulse was 188, vibrating and hard; there had been two or three liquid discharges; one very slightly marked with blood: his appearance was improved since last night, but he still refused to eat.

—At eight o'clock he took one drachm more of this mixture.—Twelve o'clock: his pulse was 192 and irre-

gular; he made frequent attempts to vomit; there had been two loose discharges of a light appearance.—Five o'clock: he appeared to be in some pain, and was very dull; his pulse was now 208, regular and feeble.—Ten o'clock: the pulse was 216, and regular; there was no other change.

Wednesday morning.—His pulse was feeble, and 192; he appeared rather better.—At ten o'clock a.m. as much of the mixture as contained 5½ grains more of extract was given to him.—Half-past three: his pulse was 168, full and regular; there was no evacuation; rigors.—Six o'clock: pulse was 204, and very feeble; he was looking very ill and dejected.—Eleven o'clock: he appeared almost unable to stand.

Thursday morning.—He had discharged, during the night, a considerable quantity of liquid alvine matter, for the most part like blood; his pulse feeble, and 168.—Two o'clock: seemed excessively weak, but did not appear to suffer much pain; he refused food.—Half-past five: gave a further dose of 5½ grains of extract.—Ten o'clock: hitherto no remarkable change.

Friday morning.—He was found dead. Some bloody alvine discharges had been passed in the night.

Dissection.—The stomach was distended with air, and its coats were much inflamed; there was abundance of venous coagula under the mucous membrane, distributed in patches; the stomach contained a small quantity of yellow putrid fluid; there was an introsusception of the colon into the cæcum, which latter intestine was in a state of mortification; the right ventricle contained a small quantity of coagulated blood, and also some fibrine; and the aorta, for the space of two inches, was filled with fibrine, completely free from the colouring part of the blood. The brain was found in a natural state.

Exp. 22.—Extract from Wine of Colchicum (obtained by evaporation from the wine of the shops, prepared in the proportion of four ounces of the fresh roots to a pint) .-At 11 o'clock, a quantity of this extract, equivalent to that furnished by two fluid drachms of eau medicinale, was given to a fine healthy dog of the mongrel breed; the pulse before the experiment was about 150, regular and full. -Four o'clock: the pulse was less full, and 148; he ate freely and appeared lively .- Ten o'clock: the pulse so exceedingly feeble, as scarcely to be felt; he had been very sick, bringing up a large quantity of undigested food and frothy mucus; looked dull and unwilling to be moved. On the following morning he was quite well, and the appetite was good .- Twelve o'clock: the pulse was 168, feeble and rather irregular: we gave him double the quantity just now mentioned of this extract.—At 4 o'clock his pulse was harder, and 156; he refused food, and looked less lively. -Six o'clock: the pulse was very feeble, and could not be distinctly counted. He had twice vomited a quantity of viscid frothy mucus, and looked dejected .- Ten o'clock: he had passed two very bloody discharges; his pulse was now so feeble as scarcely to be felt, and the animal looked drooping and very ill .- On the following morning he continued very languid; the pulse much as on the preceding night; he refused food. Towards noon, he improved in appearance and spirits .- Four o'clock: the pulse was more distinct, but irregular and slow; he still refused to eat .- Seven o'clock: he was much better; standing, and looking very lively; he now ate with a tolerable appetite .-- The next morning he appeared less lively, and would not eat. In the night he passed a watery discharge, marked with blood; the pulse was still very feeble and indistinct. He was better towards the evening, and then made a good meal.—On the next morning, he seemed quite well.

Exp. 23.—Extract from Hellebore, followed by Elaterium, and a mixture of Extract of Colchicum from its Tincture in Cape Wine.—On Friday, at eleven a.m. a drachm of extract of hellebore, the whole quantity furnished by half an ounce of the root in decoction with water, was given in the form of a bolus to a very strong lively dog, of a mixed fox-hound breed; his pulse being 160, full and regular. In a quarter of an hour, he vomited a quantity of transparent mucus, and with it the bolus; his pulse was now 172, and very feeble: he continued sick, and retched most violently during an hour and three quarters.—Two o'clock: the pulse was only 90, hard and regular.—Half-past three: appeared much recovered, and ate with a good appetite.

Saturday morning.—The pulse was 116, full, and irregular. We gave him half a drachm of the extract at half-past eleven.—At a quarter past twelve, the pulse was 126, but more feeble; he was very uneasy, and had made two slight attempts to vomit.—At twenty minutes past one, he brought up some undigested food; but there was no appearance of the hellebore.—Three o'clock: he had thrown up some more undigested food, but there were no marks of the extract; pulse 104, full and irregular.—Five o'clock: no remarkable change in the animal; his pulse had improved, and there had been no further sickness.—Seven o'clock: he appeared quite well; the pulse was 154, strong and regular.

On the following morning, he continued well; the pulse was strong, and 150.—At seven o'clock we gave him a drachm of the extract wrapped up in thin paper. In little more than half an hour, he vomited some frothy mucus, mixed with undigested food, but there was no appearance of the hellebore; the pulse was 152, hard and intermittent.—Half-past ten; had brought up some more undigested food, and with it a great part of the hellebore.

Monday morning.—His appearance was quite good; but the pulse was only 108, and very irregular.—At nine o'clock, he was made to swallow a drachm of elaterium; there was instantly a copious salivation.—Eleven o'clock: the pulse was intermittent, and 136; the dog trembled much, and looked very dull; he had vomited some viscid mucus: we could not ascertain whether any of the elaterium was amongst it.—One o'clock: he had brought up from three to four ounces of bright bilious fluid; his pulse was now 228, and very irregular; he drank freely of water.—Four o'clock: had a liquid alvine evacuation, with great effort in passing it; the pulse was 240.—Six o'clock: no visible change; the pulse was the same.

The following morning he was quite well, and ate with a good appetite .- At half-past one, two fluid drachms of an extract of colchicum, obtained from its tincture, in Cape wine (100 parts containing 53 of the extract, the quantity yielded by eau medicinale, see p. 218), were given to this dog, his pulse being then 192, and regular .- Three o'clock: the pulse quicker .- Half-past four: it was upwards of 200, and so rapid as to be counted only with difficulty; he had brought up a quantity of undigested food .- Eight o'clock: had evacuated some very viscid bloody mucus; was uneasy, and looked very dull; the pulse was the same in frequency, but rather more feeble. Half-past ten: had evacuated more bloody mucus; suffered pain on pressure of the abdomen; looked very languid; the pulse continued to be upwards of 200; it was in a great measure regular, but feeble.

Wednesday morning, June 13.—He appeared better; the pulse was 212, and more feeble than last night.—At nine o'clock, he took sixty minims more of the solution.—Halfpast ten: had vomited some frothy mucus, tinged with blood. There were some appearances of a part of the mixture amongst it; but this could not be ascertained

with certainty. He was crouching, and seemingly very weary; he refused food.—Half-past eleven: the pulse was 200, and rather more distinct; was much distressed on having the abdomen pressed.—Half-past one: the pulse was more feeble, and 210; he looked dejected, and his strength was much impaired. He staggered as he walked, and moved with evident difficulty.—Three o'clock: the pulse as before, but more irregular; he had vomited a considerable quantity of transparent frothy mucus.—Seven o'clock: appeared very dejected, and unwilling to move. These appearances continued till midnight, when he was last visited.

Thursday morning.—At two o'clock, life appeared to be nearly extinct; the animal was extended on the ground, and quite insensible; his inspirations were about twelve in the minute; and the pulsations of the heart so languid as scarcely to be felt. At seven o'clock he was found dead.

Dissection.—The stomach was distended with air, and contained about an ounce and a half of a yellow, viscid, fluid. It was highly inflamed throughout, as was also the omentum. The whole intestines were slightly inflamed; but the rectum bore the strongest marks of inflammation, and under its mucous membrane were many small coagula of venous blood. The bladder was distended with urine of a saffron colour; the gall-bladder was also much distended with bile; the lungs were slightly inflamed. The ventricles of the heart contained fluid blood of a very dark colour.

Exp. 24.—Extract from the Acetic Preparation of Colchicum.—Ten grains of this substance, mixed with water, were given to a large strong mongrel dog. This had the effect of raising the dog's pulse considerably at

first; but it afterwards became depressed, and towards evening he was greatly affected. On the following morning he appeared better, but was still much dejected and refused food. He had, in the night, evacuated some bloody discharges. He recovered towards the close of the day; and on the succeeding morning was quite well, and ate and drank freely.

This dog passed an extraordinary quantity of urine, whilst he was under the influence of the above experiment.

Exp. 25—Extract from the Acetic Preparation of Colchicum.—March 5, at 11 o'clock, ten grains of this extract (obtained as before by evaporation of the Acetum Colchici), and twenty grains of calcined magnesia mixed with water, were given to a very lively, strong, mongrel dog; his pulse being regular, and about 144 in the minute.

There was no alteration in the animal till six o'clock; he then drank some water, which he instantly threw up, together with a quantity of frothy mucus and undigested food. This was followed by a copious alvine liquid discharge. The pulse remained unaltered. At this time he passed an unusual quantity of high-coloured urine; he refused meat.

March 6.—He seemed in good spirits this morning, was jumping about, and apparently free from all inconvenience; but his appetite had not returned. He passed, during the night, two very copious fluid evacuations, only slightly marked with blood. Before night, he made a very plentiful meal, and was in all respects quite well.

Exp. 26.—Extract from the Proof Spirit Tincture of Colchicum, prepared with the dried roots, in the proportion of four ounces to a pint.—At half past one, two

fluid drachms of a mixture of this extract and water, in the proportion of 5½ grains in one hundred, were given to a strong full-sized dog of the bull species. The pulse before the experiment was 156, hard and rather irregular. Seven o'clock: no change was perceived till now, when it was observed that he had brought up a small quantity of viscid mucus, and the pulse was considerably quicker. Later in the evening, the pulse was more indistinct and very quick, and the dog had lost his spirits.

The next morning he had passed two very bloody discharges, and had been very sick, bringing up a quantity of mucus, which, in one instance, was of a bright yellow colour. His pulse was very variable in frequency, vibrating and extremely irregular; the animal looked greatly dejected, the skin was very hot to the touch, and he seemed to feel increased pain on pressure of the abdomen. At halfpast eleven, we gave him one fluid drachm in the same proportion. Three o'clock: he had twice thrown up some frothy vellow mucus, was very dull, and unwilling to walk .-Seven o'clock: he appeared much the same, and had vomited mucus similar to that before described. Eleven o'clock: a change had taken place for the worse; he lay motionless on the ground; and on being urged, walked with great difficulty. His pulse could not be felt, and he appeared to be dying.

On the following morning the animal appeared stronger, and in other respects better than before, but was still unwilling to move; the pulse was 126, very irregular and fluttering. He continued to improve throughout the day, but appeared uncommonly lethargic; his pulse was very irregular; the skin was extremely hot. At six o'clock he took some meat with a tolerable appetite. In the course of the day he passed a bloody discharge.

Thursday morning .- He was nearly recovered in all

respects, eating heartily; and his spirits were as good as before the experiment.

Exp. 27.—The same Extract inserted into a wound. Twenty grains of this active extract (obtained from the tincture mentioned at p. 510) were inserted into the inside of the thigh of a small dog, at a quarter past nine o'clock a.m. The pulse, at the time of the experiment, was 140 in a minute, and regular.

Eleven o'clock: he had vomited some undigested food, and passed two alvine evacuations, one of which was mixed with bile of a bright yellow colour: the pulse was more rapid and less distinct .- Two o'clock : the pulse was 154, hard and regular. He had passed two other loose discharges, one of a pale colour; the other much marked with blood.—Three o'clock: he had passed another small but very bloody discharge; the pulse remained the same.—Six o'clock: the pulse was scarcely perceptible; the dog appeared lethargic and insensible, and the inspirations were short and quick .- Nine o'clock: the inspirations were deep and very laborious; the pulse was not to be felt; he was in evident distress, and life appeared nearly extinct; there was a discharge of blood from the bowels, and the pain, which was seemingly considerable, increased greatly on disturbing the animal, and especially when the abdomen was pressed with the hand. In a quarter of an hour more the inspirations were only seven in a minute, accompanied with marks of distress .- Half past nine: the inspirations were only four in the minute. At half past ten he died.

Dissection.—The cardiac orifice of the stomach was much inflamed, but the pylorus had not any appearance of inflammation. The stomach contained a quantity of blood and mucus; the intestines were highly inflamed

throughout. The thigh upon which the operation was performed, was black and almost approaching to mortification. The appearances of the heart, liver, and lungs, were natural.

Exp. 28.—Sediment from Wine of Colchicum.—At half past eleven a.m. ten grains of this sediment, procured from the vinous preparation of Colchicum, which had been set by for use in the transparent state, were given to a large and very strong terrier. The Pulse at the time of the experiment was 114 and intermittent. Two o'clock: no visible effect had been produced; the pulse continued slow, irregular, and intermittent. Three o'clock; the pulse was 94 and rather fuller. Five o'clock: no alteration. Seven o'clock: he appeared lively and as well as before. Ten o'clock: the pulse was 90, fuller, and more regular.

On the following day, ten grains more were given; but this quantity, like the former, had no remarkable effect.

Two days having elapsed, ten grains more of sediment were given him; his pulse at the time of the experiment was 108 and very irregular. Three hours after, he appeared quite well, was in good spirits, and running about the yard. Two days after, a further dose of ten grains of sediment was given; but even from this additional quantity no apparent change took place in the animal.

Exp. 29.—With the Macerated Roots left by the Vinous Infusion\*, prepared according to the direction of Sir Everard Home —On Friday at 12, m. the produce

of an ounce of these roots dried, boiled in water, and reduced by evaporation to the state of an extract, which weighed 96 grains, were given to a large strong mongrel dog. His pulse before the experiment was 156, weak, and irregular.—Three o'clock: the pulse was weak, slower, and more irregular; his appearance not changed.—Six o'clock: the pulse was quick, but more feeble, and 192 in the minute; he refused food, but drank freely of water, some of which was immediately rejected from the stomach; he looked dull.—Ten o'clock: he appeared considerably weaker, and looked very dejected; he again drank most freely of water, some of which he brought up immediately. His pulse seemed to be more regular, yet less distinct, and in frequency 198; he refused meat.

Saturday morning, nine o'clock, his pulse was very feeble, and still rather quicker; his thirst was quite insatiable; and he again brought up a great part of the water he had been drinking. There has been this morning a considerable alvine evacuation of blood, both liquid and coagulated.—Twelve o'clock: his pulse was with great difficulty ascertained to be 180, and extremely feeble; he was evidently distressed, and had passed another bloody discharge.—Four o'clock: two more bloody discharges were observed; he looked exceedingly heavy.—Seven o'clock: he continued in the same state. Eleven o'clock: was lying extended on the ground, and unable to raise his head; his pulse could not be counted, and the respiration was very slow. At twelve o'clock he was dead.

Dissection.—There was a slight inflammation at the pyloric orifice of the stomach, which continued throughout the mucous membrane of the intestines. The stomach was distended with air. Some coagulated albumen was observed in different parts of the intestines.

Exp. 30 .-- Macerated Roots left by the Vinous Infusion, in the proportion of an ounce to the pint (the same, namely, as the Pharmacopæia directs for the acetic preparation) .--- One ounce of the dried roots, which had been digested as above, was boiled in a sufficient quantity of water down to an extract weighing 95 grains. This was given to a very healthy good-sized dog of the mongrel kind, at ten o'clock; his pulse at the time of the experiment being 126, strong, and rather irregular .-Four o'clock: the pulse was 180, full, and more regular; he drank freely of water; appearance unaltered .- Seven o'clock: he vomited some frothy mucus and undigested food; the pulse became more feeble .--- At ten o'clock, the pulse was so feeble and rapid that it could not be exactly counted .--- At eleven, he looked very lively, but refused to eat; his pulse was very quick, and it still could not be counted with accuracy.

Wednesday morning.---The dog looked as if recovered, but refused to eat; his pulse was regular, and 150 in the minute.---About one o'clock he vomited some bile and mucus. He continued, to all appearance, tolerably well throughout the day, and at ten in the evening took a small quantity of meat, and drank freely of water.

Thursday morning.---He was quite well, and had his appetite as usual.

Exp. 31.—Macerated Roots left by Proof Spirit, in the proportion of an ounce to the pint.—One ounce of the above roots, when carefully dried and powdered, was boiled in a sufficient quantity of water down to an extract weighing 54 grains. This was given to a very healthy good-sized dog of the mongrel breed, at twelve o'clock; his pulse being before the experiment 156, and regular.—Seven o'clock: the pulse continued unaltered

throughout the day; nor could any difference be observed in the animal's appearance. At this time also he ate heartily of meat. On the following day he seemed to be quite recovered

Exp. 32.—Macerated Roots left by Acetic Acid, in the proportion of an ounce to the pint, as the Pharmacopæia directs.—The produce of an ounce of the macerated roots, treated as in the preceding instances, was given, in the form of extract, to a large mongrel dog, at two o'clock. The pulse before the experiment was 138, and regular. There was a copious secretion of frothy saliva; but no other apparent effect resulted; and at seven o'clock he ate very heartily.

Exp. 33.—Clear Vinous Infusion of Colchicum.—At Eleven o'clock a. m. sixty minims of the clear vinous infusion of colchicum, prepared according to the direction of Sir Everard Home\*, were given to a large and very strong rough terrier.—At half past three he had passed an abundance of urine.—Half past four: the pulse was 150 and irregular.—Eight o'clock: no further visible change.

On the following morning he looked quite well; the pulse was 144, and regular. At half past one, two fluid drachms were given; this, in the course of the day, produced several copious evacuations; but the dog did not appear much inconvenienced at any period by it.

On the ensuing morning he was apparently well, but refused to take any food.—At 11 o'clock three drachms more were given. The pulse was 130.—Twelve o'clock: the pulse was 144, and regular.—One o'clock: he seemed

<sup>\*</sup> See p. 195.

affected by the medicine, and was considerably dejected; the pulse was 132, and irregular.—Two o'clock: the pulse was 144, irregular and intermittent; he had passed a fœtid loose discharge, and a plentiful quantity of urine.—Half past two; he had thrown up some thick bilious-looking mucus, was better, and running about. He drank freely of water, but had no appetite for food.—Five o'clock: he looked lively; his pulse was 190 and hard, intermitting every five beats.—Eleven o'clock: he was lively; the pulse was 188.

On the following morning, at eleven o'clock, his pulse was 140, still intermitting every two or three beats.—At twelve, five drachms more of the infusion were given to him. Two o'clock: he looked heavy, trembled much, and was altered greatly in his appearance.—Five o'clock: the pulse was 120, the respiration laborious; and he was dull and languid.—Eight o'clock: he was in the yard running about, appeared restless, and much under the influence of the medicine; his pulse was so weak as not to be counted. Eleven o'clock; the pulse was 120; he appeared much worse; the respiration was slow, and scarcely perceptible; he had vomited bloody mucus, and had passed some bloody liquid discharges. On the following morning he was found dead; and evidently had expired several hours.

Dissection.—The stomach was much inflamed, and contained a quantity of offensive bloody serum; the pylorus was nearly gangrenous; the internal coat of the duodenum, jejunum, and ilium, was highly inflamed, and almost entirely lined with coagulated albumen. The external as well as internal coats of the colon were more inflamed than the small intestines; and there was effused venous blood under the mucous membrane. The bladder was contracted, and its mucous membrane slightly inflamed.—

There were appearances of partial inflammation on the

liver; the gall-bladder was distended; the heart and blood-vessels contained a quantity of black fluid blood. The rectum was much inflamed.

Exp. 34.—The same Vinous Preparation of Colchicum, with its deposit shaken up.—At eleven o'clock a.m. sixty minims of this infusion in the turbid state were given to a common-sized shepherd dog. At two o'clock he appeared dejected, and was extended on the straw.—Half past three: no visible change.—Half past four: the pulse was 112, and very irregular.

On the following morning, his pulse was 100, and irregular.—Twenty minutes past one: two fluid drachms were given.—Four o'clock: there was no apparent alteration in the animal.—Six o'clock: the pulse was 120, and intermittent.—Half past nine: the pulse was 160; there was no other change.

On the ensuing morning he looked languid, but there did not appear any notable alteration.—At eleven o'clock, three drachms more were given; the pulse was then 120. Twelve o'clock: he appeared strongly under the influence of the medicine, and his inspirations were only fourteen in the minnte.—One o'clock: he had vomited some frothy mucus; the pulse was 84.—At half past one, he was running about the yard, when he passed a dark, bilious, and very fætid discharge.—Half past two: continued the same; there was no appetite.—Five o'clock: the pulse was 90; he looked dull.—Eleven o'clock: there was great lassitude; the pulse was 86.

The next day, at eleven o'clock, he appeared better; the pulse was small, and 180.—At 12, five drachms more were given.—Two o'clock: the abdomen was hot to the touch; the pulse 228.—Five o'clock: the pulse was 194, and small. He appeared heavy and lethargic, and had vo-

mited some bloody mucus.—Eight o'clock: he vomited blood; there was no alteration in the pulse or general appearance. Eleven o'clock: the pulse was 100, and extremely small; he suffered great pain, which seemed to increase on pressure of the abdomen and bowels. He was not altered for the worse in his appearance.

On the following morning he was found dead; but had not long expired.

Dissection.—The stomach was found highly inflamed, and approaching to gangrene. The duodenum, jejunum, and ilium, were also much inflamed; and the appearances of inflammation increased in the colon. The rectum was also inflamed, exhibiting an effusion of venous blood in small coagula under the mucous membrane. The stomach was distended, and contained about 3ij of thick yellow serum; in the intestines, grumous blood was mixed with layers of coagulated albumen.

Exp. 35.—Elaterium.—Five grains of this active substance, mixed with water, were injected into the jugular vein of a mongrel dog. There was instantly a flow of urine, and also an alvine discharge. In a few minutes he vomited some dark mucus and undigested food. In ten minutes he exhibited great prostration of strength; the pulse was feeble, regular, and 72; the inspirations were alternately quick and slow, and 27 in the minute; the eyes were fully dilated, and appeared almost starting from the head. In half an hour, he appeared distressed; there were frequent convulsive motions of the whole body; the tongue was protruded, and there was a discharge of viscid saliva from the mouth; the inspirations were very laboured, and only twelve in the minute; the pulsations of the heart could not be felt.—In

three-quarters of an hour he appeared to have expired; but, in four minutes, he made more inspirations, quicker, and not so deep. In two minutes, they were slower, exceedingly laboured, and only 7 in the minute. In fifty-five minutes after the operation, he expired.

Dissection.---The stomach was found slightly inflamed, as were the lungs; and marks of slight inflammation appeared partially throughout the intestines.

Exp. 36.—Resin of Opium.—At twelve o'clock, a drachm of the resin of opium, with which I was furnished by Mr. Battley of Cripplegate, was given to a terrier dog, his pulse then being 168, and regular. At 20 minutes past one, he threw up a quantity of transparent thin mucus, and made a whining noise, appearing very uneasy; the pulse being 96, irregular and intermittent. In ten minutes more, there was a copious discharge of frothy saliva from the mouth, and the whining continued .- At half-past two, he had several times thrown up more fluid of the above description .- At a quarter before three, he was found staggering, and seemed to have great difficulty in supporting himself; the pulse was 84, hard, irregular, and intermittent,-At half past four, he continued to throw up abundance of mucus; had not slept since he took the resin; the pulse was 114, and intermittent.-Half-past five; he looked dejected; the pulse was only 90; the pupil of the eye was much dilated; he was quiet, and seemed disposed to sleep. Slept till half-past seven; then awoke uneasy, moaning, and very restless; the pulse was 90; the inspirations were 18; and he looked very dull.

Tuesday morning.—At eleven o'clock, this dog appearing to be quite recovered, his pulse regular, and 144 in the minute, fifteen grains of Mr. Battley's sedative

extract of opium were given to him. It had the effect on the salivary glands before described, as produced by the resin, and he made the same plaintive noise .-Two o'clock: he looked dull; the pulse was 84, irregular, and intermittent.—Three o'clock: the pulse was 84; he was lying down, and very dejected .- Half-past four: he looked stupid; the abdomen was remarkably tense; the pupils were much dilated; the animal appeared to suffer great inconvenience; the pulse was 72.-Six o'clock: the pulse was 72; the appearance of the dog was very dull; there was great prostration of strength, and he made a continual whining noise .- Eight o'clock: the pulse was 126; he was standing on his legs with great difficulty, and made much noise .- Half-past nine: he was quiet, and appeared in much better spirits; the pulse was rather slower than before. He now stood with less difficulty .- Eleven o'clock: he was very restless and uneasy; the eyes were bright.

Wednesday morning.—The dog seemed quite recovered, and ate with a good appetite; the pulse was 192.—Eight o'clock p. m. he continued to mend; had passed several dark-coloured discharges; the pulse was 192, and irregular.—Eleven o'clock: no alteration.

Thursday morning.—He appeared quite well; the pulse was 160.—At eleven o'clock, fifteen grains of crude opium were given; there was an immediate slight frothing of the mouth, which was not followed by any remarkable appearance in the animal; but he looked rather dull. At three o'clock, his pulse was 120; he had passed a dark bilious discharge. On the following day he was perfectly well.

Saturday, Jan. 2, 1819.—Gave him a drachm of crude opium at twelve o'clock, the pulse being 148. At half-past one o'clock, the pulse was 180, and the appear-

ance of the animal was scarcely changed. At four o'clock, the pulse was considerably lowered, but not to be counted with accuracy, in consequence of frequent shiverings with which the animal was affected. He looked dull, frothed at the mouth a little, was almost incapable of standing, and was sensible.—Six o'clock: the pulse was much the same, and the same difficulty existed of ascertaining its number. He appeared very feeble, and uttered faint plaintive cries.—Ten o'clock: the pulse was only 66; he was extremely languid, and unable to move; the pupils were much dilated, and he seemed not to sleep throughout the day; had refused food since he took the opium, but appeared sensible.

Monday, eleven o'clock.—The pulse was the same, and the general appearances of the animal corresponded with those of the preceding night. He walked with difficulty, dragging the hind extremities, which seemed nearly paralysed; the pupils were more dilated than before; and the animal looked more stupid.—Ten o'clock p. m. he gradually mended throughout the day, and, in some degree, recovered his strength; the pulse was 66. The dog was still without appetite.

Monday morning.—The pulse was 168; he looked better; and very shortly he recovered.

From the preceding experiments I have been led to draw the following conclusions; which, for the sake of arrangement, and more familiar exposition of the subject, I shall state in the order of the experiments.

Exp. 1.—The symptoms which quickly followed the introduction of the eau medicinale into the circulation,

shew its powerful influence on the nervous system, and would appear sufficient to warrant the conclusion, that by means of this active agency, it produced death; but the extensive morbid changes, found, by dissection, on the alimentary canal, must lead us to consider, that the disturbance of the nervous system, as well as of the circulation, would, in a great measure, arise from the diseased action taking place so rapidly in the stomach and intestines; and therefore the fatal exhaustion produced may in part only be referred to the specific and primary agency of the medicine upon the nerves. This dog survived the experiment twenty-seven hours.

The action of this medicine, in common with other vegetable medicines through the medium of the circulating blood, has already been demonstrated by Sir Everard Home, in his experiments related in the Philosophical Transactions for 1816; and the experiments of earlier physiologists to the same effect, are related in the Edin. Med. & Chir. Journal for April 1817.

Exp. 2.—The symptoms in this case were fewer, but not very different in character from the former; and the appearances on dissection bore a near resemblance, although they were less in degree. The loss of blood which this animal suffered in the operation, may be considered as having hastened his death. He survived the experiment only seven hours and a half.

Exp. 3.—A larger quantity of this medicine was used, than of either of the two former preparations, as it is directed so to be administered. We are here struck by the great resemblance of the symptoms which were produced. In each instance the action of the liver was excited: but the mucous membrane of the stomach

and intestinal canal was the texture most affected. This animal survived the experiment only seven hours and a half.

Exp. 4.—The very opposite manner in which this compound medicine acted, sufficiently proves its distinct nature from the eau medicinale. The instantaneous and chief influence of this preparation on the nervous system, and the urgency of the symptoms during two hours, with the subsequent speedy recovery of the animal, present a strong contrast to the result of the former experiments, and strengthen the supposition, that death from the other medicines is chiefly to be attributed to the inflammation produced on the alimentary canal.

## Exp. 5.—Supports the conclusions just stated.

Exp. 6.—The immediate action of this compound is alone sufficient to prove its difference from the eau medicinale. The first symptoms were very similar to those in Experiments 4 and 5, affecting the nervous system powerfully; but the progress was that of active inflammation, the effects of which appeared very manifest upon dissection. This animal survived the experiment about twelve hours.

Exp. 7.—This preparation of colchicum produced very active effects in a short time. The dog survived only five hours and a half. The nervous system was much less affected than by the eau medicinale; but the appearances found on dissection were very similar from the two medicines. The lungs were affected in the present instance; which did not happen from the eau medicinale.

Exp. 8.—In this experiment the tincture was made of the dried roots, these being used in the proportion of four ounces to a pint of spirit. This is the most active preparation of colchicum which can be made, and is, in my opinion, a very unfit medicine. I have known it to operate as a violent drastic, when added to a simple purgative. In this experiment the effects produced on the heart were quite remarkable, and appear to have been the cause of death. The dog survived nine hours.

Exp. 9.—The effects of pure colchicum are here distinctly shewn; and the blended influence of the medicine upon the nervous system and alimentary canal is well demonstrated. High inflammatory action was produced. In each of the foregoing experiments, the liver was excited to increased action; but this effect may probably be rather referred to the combined derangement of parts, than to any specific influence of either of the medicines in increasing biliary secretion. This dog survived only eight hours and a half.

Exp. 10.—The comparative mildness of this preparation is rendered very evident by this experiment; the nervous system was slightly affected; and the intestinal canal and kidnies were stimulated; but the mucous membrane of the intestines did not appear to have suffered any degree of inflammation.

Exp. 11.—The immediate symptoms appear to have arisen from the disturbance of the nervous system; and those which followed, from the inflammation of the stomach and intestines. The animal survived this experiment twenty-eight hours and a half.

Exp. 12.—The greater activity of medicine, when introduced directly into the circulation, than when administered by the mouth, is here shewn; more than four times the quantity of the expressed juice being used than in the experiment by injection. The animal, although rendered very ill, recovered in a short time.

In the first edition of this Treatise, I noticed, at p. 164, "that in an old bottle of eau medicinale, the sediment which adhered tenaciously to the bottom, was considerable;" and I suggested, that this might serve to explain, in some measure, the very different activity of the medicine at different times. Sir Everard Home has since noticed this circumstance, and verified the opinion by the comparative use of the medicine, with and without the sediment, in his own case. In the present experiment, the dog recovered in a short time from the large quantity of three drachms of clear eau medicinale given in two doses.

The animal was so completely recovered at the end of five days, from the last dose, that he was made the subject of a comparative experiment with the eau medicinale, having its sediment shaken up. The immediate symptoms were very severe; and from the same quantity as before employed (three drachms in two doses), death took place in nine hours. Very similar appearances of inflammation were found in the alimentary canal as in the experiment by injection.

Exp. 13.—It appeared desirable to repeat the experiment with the clear eau medicinale, upon a fresh dog. The symptoms produced, by a dose of 60 minims, were more urgent than I should have expected; and the effect on the mucous membrane of the intestines was very con-

siderable; but the animal speedily recovered. The stimulating properties of the tincture of colchicum are strongly exemplified in the appearances, on dissection, of violent inflammation throughout the alimentary canal, even from the œsophagus; but the heart was not in any degree inflamed; a result which was produced by this medicine in the experiment by injection. The dog survived the second part of this experiment probably about 16 hours.

Exp. 14.—The effects produced in this experiment, shew this tincture to be a very active medicine, although less so than the eau medicinale. Of the latter medicine, three drachms (Exp. 11) proved destructive in twentynine hours: whereas, of Wilson's tincture, six drachms were given; and we may reckon that death did not take place until at least forty hours had elapsed. By the second dose of the eau medicinale, the pulse was rendered slower, while the opposite effect was produced by the second dose of Wilson's tincture.

The appearances found on dissection were not in any material degree different.

Exp. 15.—By this medicine, the first action upon the pulse was that of rendering it quicker; and the same effect was produced by the different preparations of colchicum, and by Wilson's tincture; but in each instance the pulse appears to have been at first rendered slower by the action of the eau medicinale. This tincture affected the mucous membrane of the intestines very severely. It is an active preparation, but more diluted in its menstruum than the other quack medicines. Twelve drachms were administered in four doses; and the animal survived the experiment four days and a half. The ap-

pearances on dissection very much corresponded with those produced from Exp. 3.

Exp. 16.—As from the eau medicinale, the pulse was rendered slower from this compound preparation; but the different result of the experiment, as in that by injection, completely negatives the opinion of Mr. Moore, of the identity of this medicine and the eau medicinale. It seems remarkable that the animal should bear such large doses of hellebore with so little comparative injury.

Exp. 17.—The chief intention of this experiment was in reference to the opinion which seems to have been conceived\*, that the eau medicinale is a composition of elaterium and laudanum; and further, to ascertain, by the administration of that active medicine the tincture of digitalis, how far the dog is susceptible to the influence of the powerful articles of the materia medica; enabling us in this way to reason more correctly in regard to the doses, and their effects, of the gout specifics on the dog. The inferences suggested by the results of this experiment appear to me sufficiently obvious. See also Exp. 6, and observations on the same, p. 524.

Exp. 18.—This medicine is, from its sensible properties, very evidently a powder of colchicum mixed with some other substance. So far as it was tried in this experiment, the effect upon the intestinal canal was similar to that produced by the other preparations of colchicum. The other preparations, being in solution, would of necessity operate in a much more active manner.

Exp. 19.—The extraordinary quantity of this preparation, amounting to three ounces in two doses, administered not only without fatal result, but even without serious symptoms being produced, is a striking proof of the modification effected in the properties of the colchicum by means of the acetic acid as a menstruum. It is worthy of observation, that, although a considerable purgative operation was produced, the mucous membrane of the intestines did not appear to have been irritated. No blood was discharged.

Exp. 20.—The intention of this experiment was to ascertain the power and fitness of water as a menstruum in the preparation of colchicum. The proportions of the fresh roots were the same as directed by Sir Everard Home in his preparation. The portion poured off clear, in the dose of two drachms, produced considerable irritation of the mucous membrane of the intestines; and a second dose of four drachms of the turbid liquor proved fatal in twenty-two hours and a half. In the turbid state, the colchicum was very much concentrated. The superiority of acetic acid as the menstruum, is sufficiently apparent when brought into contrast with the present simple preparation. The influence of the colchicum in increasing the frequency of the pulse, is again worthy of observation, as illustrated by this experiment.

Exp. 21.—In this and the following experiments with extracts, my chief object was to ascertain the possibility of making a preparation of colchicum equally active with the eau medicinale. At page 218 I have stated that 100 parts of eau medicinale furnished 5½ grains of extract; and such was the exact quantity from that specimen. But other vials have furnished a larger

quantity, and hence another explanation is afforded of the uncertain activity of the medicine administered in the same given doses. In these comparative experiments, however, no fallacy arises from this circumstance, as the proportions employed were of extract itself, and of the same consistence. The usual liquid contents of a bottle of eau medicinale are 120 grains. It appears that in the present experiment 161 gr. of the extract were administered before death was produced. Now, as one vial which was evaporated for the purpose, furnished eleven grains of extract, and another only eight, we may calculate the 161 gr. to be equivalent to two bottles of the liquid; and this was the quantity employed in experiment 11. In that experiment the animal survived 28 hours and a half: in the present, death did not take place until nearly four days had elapsed; but the quantity in this last case was given in three doses instead of two, as in the first; and therefore we are not led to the conclusion, that any of the virulence of the medicine was dissipated in the careful evaporation of it. The peculiar odour of the eau medicinale comes over by distillation. With regard to the symptoms in this experiment, it may be noticed, that the pulse was rendered quicker by the repeated doses of the medicine. The reverse happened in experiment 11. Is this to be imputed to the difference of constitution in different dogs? Or is it probable that the eau medicinale is a compound preparation, and that its more sedative part becomes dissipated by evaporation? The morbid changes of structure were here rather more remarkable than in experiment 11. The insulated state of the fibrine in the aorta, moulded by the vessel, and which, occurring in the human subject, was formerly called a polypus of the vessel, seems connected with the laboured death of the animal; and appears to demonstrate the powerful influence of the medicine upon the circulation.

The introsusception of the intestine, marks its severe action upon the muscular function of the bowels, together with its destructive effects upon the mucous membrane.

Exp. 22.—The animal recovered in a short time from the administration of twenty grains of this extract. It is true that the immediate symptoms were urgent, but we again see the proof of the superior activity of the eau medicinale.

Exp. 23.—I was desirous in this experiment to compare the effects of hellebore, elaterium, and colchicum, in the solid form. The hellebore rendered the stomach extremely irritable. Less of sedative effect was produced on the pulse than in experiment 16, in which opium was joined with the hellebore. It is evident, from all the experiments with hellebore, that the dog, although seriously disordered by it, can bear very large doses without fatal consequence.

The dog was also able to take a very large dose of elaterium without death being produced. Indeed the recovery was so quick that it seems necessary to suppose that the medicine was rejected from the stomach. The influence upon the pulse was very different from that of hellebore, the elaterium producing excessive frequency. This happened also in experiment 17. The destructive properties of colchicum are shewn in the latter part of this experiment. Ten grains of extract, obtained from a vinous preparation, given in two doses, proved fatal in forty-eight hours. That this smaller quantity than what was used in experiment 22, should kill the animal, is to be considered in connection with the previous administration of two powerful medicines, which must have ren-

dered the animal more susceptible of injury, independent of any mischief which they might have produced.

Exp. 24 and 25.—These experiments afforded a further and still more convincing demonstration in how very favourable a manner the acetic acid modifies the properties of the colchicum. The kidnies were excited to increased action in a remarkable degree. The mucous membrane of the intestines was only slightly irritated, if we compare its effects with those produced by the other preparations of colchicum; and this effect is more clearly shewn in the result of the following experiment.

Exp. 26.—We have here further to observe, in how very different a manner the colchicum acts, according to the menstruum which is employed in its preparation. About seven grains of this extract produced very severe symptoms, and a second dose of four grains almost proved fatal. Indeed symptoms of almost equal severity followed the use of this substance, as from a similar quantity of extract obtained from the eau medicinale. The first dose of the eau medicinale extract rendered the pulse slower; the opposite effect was produced by each dose of the colchicum extract. The animal recovered very quickly from this experiment, when we consider the intensity of the symptoms which he suffered,

Exp. 27.—This experiment points out that the colchicum is very quickly absorbed into the circulation; and the rapid progress of the symptoms demonstrates the virulence of the medicine. This is further shewn by the local action of the extract. We may here again notice the immediate influence of colchicum in quickening the pulse. The animal survived the experiment only twelve

hours. The morbid changes discovered on dissection were similar to those produced by injection of the medicine into the circulation, and its administration by the mouth.

Exp. 28.—Sir Everard Home having found, as I have stated at p. 526, that the eau medicinale was a much more active medicine when used with its sediment, than if poured off clear, and considering the vinum colchici to be substantially the same medicine as the eau medicinale, he was induced to make trial of the sediment of the colchicum administered in a separate state. He relates, Phil. Trans. Part II. that "six grains of the deposit of the vinous infusion of colchicum were given to a dog in bread and milk: in three hours it produced vomiting and purging, which lasted twenty-four hours; during the latter part of that time there was blood in the stools, as well as in what was brought up from the stomach." The result of this experiment led Sir Everard to recommend the use of the vinous infusion of colchicum in its transparent state, after having by degrees deposited its sediment. The latest observations of Sir Everard are contained in a letter to Mr. Brande, published in No. XI. of the Journal of Science and the Arts; and he states " that the deposit which is separated from the infusion by keeping, when given by itself in the dose of a few grains, produced inflammation and ulceration on the coats of the stomach and intestines;" and "that the infusion removes the paroxysm of gout equally readily, whether given without the deposit as with it." Being anxious to ascertain to what extent the deposit might be administered to the dog, I carefully collected a large quantity of that sediment, which the vinous infusion of colchicum very slowly deposits after its last filtration, and being put by for use in the transety

parent state. My surprise may be conceived on finding, that even thirty grains\* were administered in three doses, without any appearance of inconvenient effects to the animal.

I am wholly at a loss to account for the very different result of my experiments; for I must necessarily conclude that the deposit of the vinous infusion of colchicum is an inert substance. It appears to me to consist chiefly of insoluble extractive matter. It cannot be dissolved either in wine or diluted spirit, even with the assistance of heat. On the contrary, the sediment of the eau medicinale is perfectly soluble in its own liquor, by the application of heat. Hence a very striking difference is manifested in the nature of these two medicines.

Exp. 29.—My intention in this and the three following Experiments, was to ascertain the comparative degree in which the respective menstrua had extracted the properties of the colchicum. In the formula directed by Sir Everard Home, the alcohol of the wine is first carried off by distillation, and therefore the remaining fluid may be stated to be, little else than mere water, holding in solution portions of saline and vegetable matter. This I conceive to be a very unfavourable menstruum, as from the quantity of mucilage of the colchicum taken up by the water, it is almost impossible to obtain a clear liquor. On distilling some of the infusion procured from Fisher's, a considerable portion of spirit was obtained; so that I presume it has been found expedient to deviate from the

<sup>\*</sup> This sediment was freed from its moisture by being placed in the cavity of a piece of chalk-stone; and the dose expressed he at was of dry sediment. Hence it is readily seen that the quantity administered was very large. It was given in minture with a little water.

formula in question, either in using wine itself, or in adding some alcohol to the aqueous liquor. It is demonstrated by the present experiment, that the menstruum in question had only partially extracted the active properties of the colchicum. I think, however, that this is chiefly to be imputed to the very large proportion of roots employed; no less, namely, than 2 pounds to 24 oz. of menstruum. The animal was affected with very severe symptoms, and died in thirty-six hours.

Exp. 30.—The result of this experiment, with a vinous infusion of a much smaller proportion of solid material, confirms the inference just now stated. More symptoms, however, arose than might be expected; but the animal quickly recovered.

Exp. 31.—This experiment points out that the proof spirit is a very successful menstruum in depriving the colchicum of all its active properties; but I have before\* offered my objections to its employment as a medicine.

<sup>\*</sup> See p. 194, 198, and Exp. 8, 26, 27. At p. 219, I have erroneously described the pure alcohol menstruum as dissolving most of the principles of the colchicum; for in a subsequent Exp. with proof spirit, I found that 100 parts yielded six grains of extract, proving that it is by far the most active of all the menstrua which can be employed. I may here take occasion to mention that one of the fluid preparations of colchicum which I employed proved almost wholly inert. I obtained it from a very respectable chemist. On examining the roots which had been used, I found that, instead of being firm and mealy, they were very porous and fibrous. Hence a lesson is afforded to the chemist, of the necessity of examining the condition of the roots before they are employed for medicinal purpose.

Exp. 32.—The large proportions in which the acetic preparation can be used with impunity, as shewn in Exp. 19, 24, and 25, would naturally suggest the question, Does the acetic acid really extract the virtues of colchicum; for otherwise little praise would be due to it for the mildness of its operation? The present experiment answers this question most satisfactorily; and appears to me to lend a full support to the preference which I have assigned to the acetum colchici, over every other preparation of this medicine.

Exp. 33.—The result of Exp. 28 having been so directly opposite to what I expected, I was desirous to ascertain the comparative activity of clear and turbid portions of the infusion of colchicum, prepared according to the formula of Sir Everard Home. It appears that 11 drachms of the clear infusion were administered in four doses, and that death took place in 88 hours. The appearances on dissection indicated very high inflammatory action.

Exp. 34.—This experiment serves to shew that the clear infusion possessed as much of the active properties of the colchicum, as the turbid. The terrier dog was even the strongest in appearance. In this experiment the animal survived a few hours longer than in the preceding instance. Hence, according to each of my experiments, it follows, that the deposit of the vinous infusion of colchicum is an inert substance; and, consequently, that the clear infusion is as active a medicine as that which is turbid from the admixture of the sediment. It is worthy of observation, how much weaker a preparation this infusion is, than the eau medicinale, Wilson's tincture, and Reynolds's specific; which, in the ratio of their strength,

may be ranked in the present order; but notwithstanding this fact, we see its destructive influence upon the stomach and alimentary canal of the dog, in doses very far short of those of acetum colchici and magnesia administered with perfect impunity. I must add, that again and again I have prescribed the latter medicine with every benefit, to those patients who had previously taken the vinum colchici with ill effect and disappointment. I am quite aware that some gouty persons do take this medicine with much apparent advantage, but I contend that such instances form a strong exception to the general rule. I have already in this Treatise, detailed my objections to the principle of arresting gouty action, by a few specific-acting doses of this or any other medicine.

It appears to be the object of those who prescribe the gout specifics, to avoid producing any effect upon the secreting organs, and to treat the gout as a painful nervous irritation. The following is the rationale expressed by Sir Everard Home in the letter to which I have already referred. "The infusion (of colchicum) when clear of the deposit, can be taken in doses of 60 or 70 minims without producing any disturbance in the stomach, increasing any of the secretions, or bringing on an irregularity of pulse; effects which commonly occur when that dose is given with the deposit mixed with it." On the contrary, it is professedly my object to remove vitiated secretions which are accumulated, by exciting the bowels and kidnies to increased action; to allay the irritation of the nervous system, and relieve pain by sedatives; further to mitigate the local gouty action, and preserve the limbs from lameness, by local treatment; and, lastly, not to consider the disease as cured, when all the external symptoms have passed away; or, to speak

more familiarly, when the fit of gout seems completely over; but to follow up an alterative method of treatment, both by a mild course of medicine, and attentive regimen, so that the constitution shall by degrees be radically changed.

Exp. 35.—In the administration of elaterium by the mouth, Exp. 17 and 23, so large a quantity was given without death being produced; and as in Exp. 6, by injection, laudanum was joined with it, I thought it desirable to make a distinct experiment by injection, which might unequivocally shew the influence of elaterium upon the dog. The morbid appearances found on dissection were not sufficient to account for death, which took place in the short space of three quarters of an hour. We ought therefore to conclude, with Orfila, who classes elaterium with the acrid poisons, "that death, which is the consequence of the administration of this substance, must be attributed to the disorder of the nervous system sympathetically affected\*." I have no doubt, that in Exp. 17 and 23, the animal rejected the medicine from the stomach. Orfila tied the œsophagus, in his experiments of administering elaterium by the mouth.

Exp. 36.—The sedative action of the resin of opium was much more remarkable than might be expected, and serves to shew that the anodyne properties of opium must be in some degree weakened by the separation of its resin, although its stimulating qualities may thus be lessened. The dose of sedative extract was in the proportion of a fourth to the resin, but it acted in a very similar manner and degree. The dose of 15 grains of crude opium had

<sup>\*</sup> Wallis's Translation, vol. ii. p. 16.

scarcely any effect, except that of rendering the pulse slower. One drachm produced powerful effects on the nervous system: but we see that from this large dose, in addition to what had been before administered, the animal shortly recovered. How well does this experiment answer the objections of those who may be disposed to doubt the instruction afforded by the present experiments with the gout medicines, as applicable to their administration to the human subject. The dog can take, without fatal injury, very large doses of those powerful agents, hellebore, elaterium, opium, and digitalis; whereas, of the several gout medicines, the repeated portions employed in the present experiments were such as are directed for the human subject, or nearly so; and we witness the destructive effects produced.

In regard to the probable nature of the eau medicinale, it appears to me rendered sufficiently evident that it cannot possibly be a preparation from the bulbs of colchicum. Orfila makes mention of the active qualities of the seeds of colchicum. I shall take a convenient opportunity to ascertain whether a preparation can be made from the seeds, agreeing more with all the properties of the eau medicinale, than the medicines which have been made the subject of these experiments.

In addition to what I have mentioned of Wilson's tincture, at page 217, I have to observe, that it appears, by its action on the dog, and from other circumstances, to be a concentrated preparation of colchicum. It resembles a mixture of the extract obtained by evaporation with diluted spirit, and does not become transparent on being heated.

Reynolds's tincture appears, from good evidence, to be a preparation of colchicum in rum, with colouring matter, more diluted than Wilson's tincture, but most probably a concentrated warm infusion. Its sediment, like that of colchicum in the other preparations, is insoluble.

I shall here conclude the details of this experimental inquiry. I fear that the reader may consider them tedious, and not completely satisfactory; but I trust they will be found in some degree important and instructive.

THE END.

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