

nitrite), reflex motion appeared in four minutes, and sensibility returned in six minutes. In this kitten, the cardiac sounds were nearly inaudible, and its action very rapid; but, upon inhaling the nitrite of amyl, the cardiac sounds became louder, and its action less rapid.

Experiment 3.—A kitten with a temperature of 100.2 degs. Fahr. (thermometer in the axilla) had nitrite of amyl to inhale, which raised its temperature to 100.8 degs. Fahr. In this case, the amyl-nitrite produced reddening of the nose and mucous membrane of the mouth. The dose being small, it did not make the kitten insensible. I may state that, twenty-five minutes after inhaling the nitrite of amyl, the temperature in the axilla was 100.6 degs. Fahr.

Experiment 4.—A kitten, whose temperature was 100.2 degs. Fahr., got chloroform; after it recovered sensibility, its temperature was 98.8 degs. Fahr. The fall of temperature caused by chloroform was 1.3. The kitten was trembling with cold. The number of minutes before reflex motion appeared was nine, and before sensibility returned was fifteen. The chloroform made the heart's sounds rapid and weak.

Experiment 5.—The same kitten was again, two days afterwards, made insensible with chloroform. The anæsthesia was complete at 5.27 P.M. Three minims of nitrite of amyl were then given for inhalation. At 5.29 P.M., reflex motion appeared; at 5.30 P.M., it tried to raise its head and move; at 5.32 P.M., it began mewing and standing. The nitrite of amyl produced reddening of the nose and mouth, while it made the heart's action stronger, less rapid, and its sounds louder. Its body felt quite warm. I unfortunately did not take its temperature with the thermometer.

Experiment 6.—The same kitten was again, two days afterwards, anæsthetised with chloroform. Ten minims of amyl-nitrite were then given, which, at first, made the cardiac sounds louder and its action slower, but its sounds soon got weak and its action rapid. Reflex motion appeared in three minutes; it began opening and looking about in four minutes; tried to rise in five minutes, and began walking, although it staggered a good deal in doing so, in six minutes. I may mention that, in this experiment, the large dose of nitrite of amyl produced cyanosis of the nose and mucous membrane of the mouth.

The following table will conveniently show the effect of amyl-nitrite on the chloroformic anæsthesia.

No. of the Experiment.	No. of minutes before reflex motion appeared.	No. of minutes insensible.
1. Chloroform only.....	5	11 minutes 30 secs.
2. Amyl nitrite after chloroform.....	4	6 minutes.
4. Chloroform only.....	9	15 minutes.
5. Amyl nitrite after chloroform.....	2	3 minutes.
6. Amyl nitrite after chloroform.....	3	4 minutes.

The average duration of insensibility, according to the above table, in kittens when chloroform only was given, was thirteen minutes; while in those that inhaled the nitrite of amyl after chloroform, it was four minutes twenty seconds.

Experiment 7.—A kitten was rendered quite insensible with twenty minims of nitrite of amyl. It kept mewing although quite insensible. Its respiration became very slow, and was performed in the following manner. A sudden inspiration followed by expiration, then it would stop breathing for a considerable time, when it would again make a sudden inspiration, etc. It died in five minutes from the time it became insensible. Before death, its nose and tongue were quite cyanosed.

POST MORTEM EXAMINATION, three hours after death.—The *lungs* were collapsed, floated in water, were more full of blood than normal; upon section, blood exuded from their cut surfaces.—*Heart.* All its cavities were filled with blood. The vena cava and the pulmonary vessels were distended with blood, while the aorta was empty. The blood in all the cavities of the heart was quite fluid and of a dark colour; upon exposure, it soon coagulated.—*Brain.* The vessels on its surface were full of blood; its cut surfaces were of a natural appearance to the naked eye and of a normal consistence.

Experiment 8.—A kitten, with a temperature of 100.8 degs. Fahr., was made insensible with nitrite of amyl. It having almost ceased breathing, the respiration was kept up artificially; its nose and the mucous membrane of its mouth were cyanosed, while the veins under its tongue were engorged with blood. It kept licking its lips with its tongue, and moving its forelegs, although quite insensible. It passed feces and urine. When it was recovering, a very small quantity of chloroform was given it (inhalation), which, as it seemed to make it worse, was discontinued. After this kitten recovered sensibility, its temperature was so low that the clinical thermometer did not mark it. The amyl made the heart beat very rapidly, while it made its sounds very feeble.

Experiment 9.—Another kitten was also made insensible with nitrite of amyl. The results were similar to the above.

Experiments 10 and 11.—Two kittens got chloroform at the same time, when both were quite insensible, one got four minims of nitrite of amyl to inhale, and the other twenty minims. The first recovered consciousness in six minutes; the second (which inhaled twenty minims of nitrite of amyl) took twenty-five minutes to recover consciousness. In these two experiments, it will be observed, that a small dose of nitrite of amyl hastened the recovery from the chloroformic anæsthesia, whereas a large dose prolonged it. It is also well worth mentioning that, in the first kitten, the small quantity of amyl caused reddening of the nose and mouth; while, in the second, a larger quantity of amyl produced cyanosis of the nose and mouth.

From the above experiments, I beg to submit the following deductions.

1. Amyl-nitrite, when inhaled in small quantities, produces reddening of the face in man, and of the nose and mouth in kittens; this action is due, according to Brunton, to the dilatation and overfilling of the arterioles.

2. When inhaled by kittens in large quantities, it produces cyanosis of the nose and mouth along with insensibility. The cyanosis arises from overdistension of the venous system (experiment 7), this being due to the engorged arterioles propelling the blood into the veins, while the insensibility is probably caused by overdistension of the venous system and the heart.

3. When inhaled in small quantities, it produces recovery from chloroformic insensibility (see experiments 1, 2, 4, 5, and 6), by dilating the arterioles of the brain, and thus removing the cerebral anæmia due to the chloroform.

4. When inhaled in large quantities, instead of producing recovery from chloroformic insensibility, it not only retards it, but it may cause death by paralysis and overdistension of the heart, and engorgement of the venous system. *Vide* experiments 7, 10, and 11.

5. It causes a rise of temperature when inhaled in small quantities by the increased amount of blood in the arterioles causing an increased tissue change in the body (experiments 3 and 4).

6. In large doses (inhaled) it produces a fall of temperature (experiment 8).

7. It also helps to produce recovery from the chloroformic insensibility by raising the temperature which is always lowered by chloroform, and by removing the paralysis of the heart due to chloroform; this action is well seen by the nitrite of amyl making the heart's beat fewer and its sounds louder.

8. Death is caused chiefly by paralysis of the heart, which is shown by all its cavities being distended, and by engorgement of the venous system.*

CASE OF MALIGNANT CHOLERA TREATED BY NITRITE OF AMYL AND HYDRATE OF CHLORAL.

By EDWIN FAIRLAND, L.R.C.P.Ed., Staff-Surgeon, Lucknow.

PRIVATE J. C., 8th Royal Irish, confined in the Lucknow Military Prison, aged 36, in service fifteen years and nine months, in India one year and eight months, of bilious temperament, and of previous good health, was seized with an attack of malignant cholera at 9.45 A.M. on June 22nd, 1876. In the previous week, there had been two other cases of cholera in the prison, terminating fatally in seven hours each. Both cases were of the most malignant type.

He had suffered for two or three hours from slight fæcal diarrhoea when the symptoms of cholera manifested themselves, and he was at once removed to hospital. The symptoms on admission were constant and severe purging of rice-water motions; very severe cramps in the abdomen and legs, the abdominal muscles being knotted up and feeling like a board under the hand; surface of the body cold and clammy; extremities very cold and livid in appearance; excessive thirst, accompanied by constant vomiting of watery fluid; facies cholericæ strongly marked; conjunctivæ flattened; eyes sunken and a dark ring surrounding them; countenance livid and shrunken; breath and tongue cold; voice whispering. He was almost unconscious, being roused with difficulty; and apparently quite callous as to the result of his illness. The respirations were laboured. The pulse at the wrist was barely perceptible and thread-like. He complained of great heat of body, and preferred to lie quite naked. Six hours after admission, he passed about two quarts of rice-water motion. After being under treatment, a slight reaction commenced; the extremities becoming warmer and the pulse slightly fuller—98 per minute; but the cramps

* These experiments were made before the Vivisection Act came into operation.

and vomiting continued unabated. Prostration was very much marked; he could not raise his head from the pillow. The thirst was intolerable. The symptoms continued the same until twenty-three hours after admission, when he was again purged, passing about a quart of rice-water fluid. The cramps and vomiting were incessant; the temperature unaltered. He dozed off to sleep at intervals. About forty hours after admission, reaction was fairly established; the eyes were becoming fuller and brighter; the complexion lost its lividity; the tongue, breath, and surface became warmer; the pulse fuller, 98; respirations easier, 14 a minute. About fifty hours after the seizure, he complained of pain in the back and limbs and great debility, and became very restless, sinking down to the foot of the bed, and very despondent. Thirst was extreme, and vomiting incessant. The cramps occurred at long intervals. There was no purging. He was slightly incoherent and wandering in his ideas, though conscious when sharply spoken to; he had occasional muttering and great restlessness. Sixty-nine hours after the seizure, and for the first time since early on the morning of the seizure, he passed twelve ounces of urine. His bladder had been empty up to this time. On the morning of the fourth day, the conjunctivæ became highly inflamed; the skin remained moist and warm; pulse regular and full. He voided about eight ounces of clear and limpid urine. He continued very restless, complaining of headache. At 9 P.M. he passed a large quantity of urine. The purging had completely ceased. He had been sleeping. The thirst continued; the vomiting had ceased. The inflammation of the conjunctivæ was diminishing. There was no headache, his mind was clear; great debility remained. On the sixth day, the bowels were opened by castor-oil, the motions being normal. From this time he continued to improve. The debility was overcome by appropriate nourishment, and, on the tenth day, he was removed to another hospital for change.

Treatment.—Soon after admission, I gave him five minims of nitrite of amyl by inhalation, and continued this steadily every half hour until twenty hours after admission, when it was inhaled hourly for fourteen hours more. It was then administered every two hours in the same doses until fifty-six hours after admission, when it was discontinued altogether, reaction having been well established. Five drachms had been inhaled altogether. I also hypodermically injected hydrate of chloral in two grain doses—strength of solution I in 10. Of this drug, sixty-four grains were injected altogether, at intervals of about two hours, in the arms, legs, and twice over the epigastrium. No evil results locally followed any of these injections. About twenty-nine hours after his seizure, the following mixture was taken every two hours: R Liquoris ammoniæ acetatis ℥ij; potassæ nitratis gr.xv; spiritus ætheris nitrosi ℥j; olei juniperi ℥ij; aquæ ℥j. M. After taking this medicine for twenty-eight hours, the kidneys resumed their function, and twelve ounces of urine were passed. His body was frequently sponged over with tepid vinegar and water. Sinapisms were applied over the kidneys, and, on the third day, I allowed him a small quantity of beer, which he retained, and which seemed to promote diuretic action. During the whole time, he was allowed to drink as much soda-water and ice as he needed.

In concluding these notes, I wish to say that I have recorded them for the sake of information; a much more extended experience being necessary to prove whether either or both the two drugs relied on in this case had any real curative power over the disease that has hitherto proved so unmanageable. I was induced to try the nitrite of amyl by reading some remarks on its action by Dr. B. Richardson; and, last October, a case occurred in the military prison very strongly resembling cholera, in which I tried it with the most satisfactory results; warmth and animation to the collapsed system being almost immediately restored by its use. I have also employed it in a few native cases of cholera with more or less satisfactory results; but it is not easy to employ amyl in such cases and note the results with the same accuracy as in European cases.

I used it, also, in the two cases of cholera referred to in the opening lines of these notes; but the disease had seized the poor fellows with such full force, that nothing short of a perfect antidote to cholera could have saved them.

A HOSPITAL at Lanark, erected and endowed by Sir Simon Macdonald Lockhart of Lee, was formally opened to receive patients on the 13th ult. During the past five years, there has been in use a temporary hospital, which has been very successful. The new building is situated in the western suburb of Lanark, and has a southern exposure. The front elevation consists of a main block of two storeys, with projecting wings on each side, each ending in a gable flanked by small round towers with conical roofs. Each wing contains a ward with six beds, and a private ward.

THERAPEUTIC MEMORANDA.

TREATMENT OF "CHRONIC DIARRHŒA," BY KOUMISS.

IN reference to several articles on this subject, which have appeared in our JOURNAL at the end of last year, I think the following notes may be of interest and use.

We all agree that, amongst the great variety of pharmaceutical remedies, there are many which, in so-called constitutional diarrhœa, produce but a temporary benefit; and, with the cessation of the use of the remedy, the diarrhœa returns upon some slight error in diet or after cold to the feet, abdomen, etc. I have had during the last few years opportunities of treating various kinds of chronic diarrhœa in young and old, thin and stout people. In some cases, the opium preparations; in others, the mineral acids and vegetable astringents, or aqua calcis, etc., were sufficient to cure an attack, or even the disease itself but in other cases I battled in vain, although I have employed nearly all the good weapons of the *Pharmacopœia*; but it struck me particularly that these latter cases were especially those in which the appetite, digestion, and in some even the nutrition, were more or less impaired. In all of these cases, I evidently lost ground with every return of the diarrhœa; being, therefore, compelled to look around for other preparations to combat these latter complications, I am happy to say I found in the old koumiss, of either sort of full, medium, and whey-koumiss—according to the plumpness of the individual—the required remedy, which in a few weeks cured the chronic diarrhœa, increasing at the same time the appetite, and improving the nutrition. These latter properties of the koumiss are particularly advantageous in all complications with chest-diseases, in cases of excessive expectoration, in heart and kidney-diseases, and wherever anæmia, general weakness, and impaired digestion and nutrition prevail. Children with lymphatic constitutions, swollen abdominal glands, and relaxed mucous membranes, with scrofula and a general bad health, benefit very greatly by a koumiss treatment in a few weeks. In stout people, I usually curtail the diet to very small but frequent meals of fish, eggs, meat in any form of cooking, and I allow them to drink as much old whey koumiss as they may like; but the articles generally to be avoided during the treatment of chronic diarrhœa, especially at the beginning, are: milk, beer, sugar, vegetables, and fruits; most of the condiments, as onions, garlic, mustard, pepper, vinegar; certain fats and oils, particularly oily fishes and birds. These restrictions are absolutely necessary, and are to be relaxed only when the digestion improves and the normal tone of the bowels returns, which shows itself in a normal frequency of the stools, and the normal shape, colour, etc., of the fæces. In two or three months, and sometimes sooner, I find patients have nearly entirely been freed of these restrictions, without fear of a recurrence of their chronic complaints.

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TREATMENT OF RINGWORM BY CHRYSOPHANIC ACID

IN reply to Dr. Foulis's inquiry, I may say that it is not quite probable that Goa powder should contain in any form the leaves of the cassia lata. All that is at present known of the composition of Goa powder is, that it is derived from some kind of leguminous tree, probably from the medulla or pith of the stem and branches. Nevertheless, his communication is remarkably interesting, inasmuch as the cassia lata is also a leguminous plant. Chrysophanic acid, which exists in Goa powder to the extent of 85 per cent., has also been separated from the medicinal rhubarb-root, of which it forms 2½ per cent., and it has also been found in dock-root. But I have reason to judge from the numerous authorities I have consulted, that chrysophanic acid has not been found in the senna plants (*Cassia elongata, lanceolata, et obovata*) but I cannot say anything as to the cassia lata.

As to the question of either Goa powder or cassia lata leaves doing good to ringworm, it must be remembered that there are two kinds of ringworm; namely, strict ringworm, and ringworm of a less exclusive kind. Under the latter heading, I should include what is known as "Indian ringworm", which is a very comprehensive term indeed, and bears about the same relation to English ringworm as an empire does to a kingdom; for example, it does not require the presence of an all-important parasite.

Dr. Foulis's description does not make it quite clear to which kind of ringworm he refers; that is to say, he leaves it in doubt whether he