

A full-grown *ptyas mucosus*, or rat snake (*dhamin*), was bitten at 12-27 p. m. by a fresh cobra about two-thirds grown, and of a light brown color. The cobra was made to close his jaws in three different places at about two feet from the head of the *ptyas*. The bitten snake was then placed in a large box, with a wire front. 12-33.—*Ptyas* moving about actively in the box and darting out his tongue frequently. 12-40.—Seems very restless and uneasy; strikes at everything that approaches the cage. 12-57.—Active as ever. 1-2 p. m.—No change. 2-30.—No change.

There was no further change, and on the 13th the snake was quite well.\*

The *ptyas*, *dhamin*, or rat snake, is very active and vigorous. The individual bitten must have been about eight feet in length. The cobra was about half the size.

#### EXPERIMENT No. 2.

A *varanus flavescens*, or *gohsāmp*, about two-thirds grown, was bitten at 12-38 p. m. in two places,—one on the thorax behind the foreleg, and one on the inner side of the hindleg, by a powerful, full-grown, and fresh cobra, about six feet in length, of a lightish color, and distinctly marked with the spectacles on his hood. 12-42.—The lizard lies quiet in the cage. 12-46.—Crawling about in the cage; slightly drags his forelegs. 12-55.—Very quiet; looks sluggish; eyes partially closed. 1 p. m.—Very sluggish; was taken out of the cage and placed on the floor of the room, where he moves. The forelegs are dragged with the palmar surface of the feet turned upwards, but when much roused, he is able to use the forelegs. 2-30.—Appears a little less sluggish; looks about. 2-45.—Replaced in the cage; has moved about in the cage, but is sluggish. Hardly responds to stimulus when roused. He remained for the rest of the day in this state. 11th March, noon.—Sluggish, and can hardly be roused. 4 p. m.—He died quietly.

#### EXPERIMENT No. 3.

The cobra that bit the *ptyas* in experiment No. 1 of this series was bitten by another fresh cobra of a much darker color at 12-45. The snake was made to close his jaws in two places, and, as in the other experiment, not only could the fangs be heard to penetrate the scales, but the marks of the puncture were visible, and the poison was left on the surface of the part near the punctures. The snake, after being bitten, was returned in a cage like that of the *ptyas* in the 1st experiment. 1-2 p. m.—Lying quiet, apparently unaffected. 1-15.—No change. 1-35.—No change. 2-30.—The only change is that the snake is on the alert, and keeps his head erect with hood spread.

No further change occurred after this, and on the following day the snake was well. It may be noted that this cobra was partially exfoliating his skin at the time when the experiment was made.

#### EXPERIMENT No. 4.

A *ptyas mucosus*, about six feet in length, was bitten by the large cobra at 12-54. Before closing the snake's jaws on the part the scales were scraped off. Blood was freely drawn by the snake's fangs from bites inflicted in two places. (This was the same cobra that bit the *varanus*). 1-8 p. m.—Appears sluggish; wound bleeding freely. 1-16.—Perfectly active, and moves about rapidly in the cage. 1-35.—No change.

There was no apparent change in the snake all that day or the next, except that it may have been little more sluggish. He died during the night of the 11th, being found dead on the morning of the 12th.

#### EXPERIMENT No. 5.

A very large bull-frog, "*rana tigrina*," was bitten severely in the inner side of the hindleg in two places, at 1-57 p. m.,

by the same large cobra that bit the *ptyas* and *varanus*. 2 p. m.—Frog walks about; bitten leg rather dragged. 2-5.—Seemed anxious to escape, and gave several cries as of pain or fear. But there was no further change; the frog remained quite well on the 13th.

The blood of the *ptyas* and of the *varanus* was examined by Dr. Colles and me with a one-eighth inch object-glass and the A eye-piece. There was nothing suggested of any change in the corpuscles.

It is to be remembered that death in both these cases occurred very slowly, allowing abundance of time for any blood change to take place. Of course the appearances in reptilian might be expected to differ from those in mammalian blood; but I doubt if there be anything to indicate such changes as Dr. Halford describes in human blood after the cobra bite.

However, the matter is still *sub-judice*, and requires many experiments, and those often repeated, before any decided conclusion can be formed.

It is especially noticeable that the deaths took place very slowly, and that the effects of the bite, even of a very powerful cobra, were much more gradually manifested in the cold than in the warm blooded animals. The frog escaped altogether, but this may be owing to the cobra having been somewhat exhausted by biting two other animals. I can hardly imagine that it was so; for when the snake's mouth was opened to make it bite the frog, the poison dropped freely from the fangs. It is probable that the quality, rather than the quantity, may be affected by the rapid discharge of the fluid, and that the exhaustion is caused by the excitement of rage as well as by that of fear, to which, under the circumstances, the snake is naturally exposed. The experiments were carefully conducted, and the snakes were handled by the same old man who officiated on a former occasion. Dr. Jerdon and Dr. Colles were present with me during the experiments.

### A BRIEF REPORT OF THE OUTBREAK OF CHOLERA AT AJMEER DURING THE RAINY SEASON OF 1867.

BY T. MURRAY, M.D.,

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As soon as it was known that cholera had broken out among the pilgrims at Hurdwar, all proper precautions were taken, and arrangements made by the Civil and Police Authorities of this district, to prevent pilgrims from passing through Ajmeer. These arrangements were successfully carried out; and I have been informed that very few pilgrims passed through this station. Those who were returning to Guzerat and the Deccan, branched off between Jeypoor and Kishengurh, one party taking the road through Marwar, and the other that through Meywar.

Reports had reached us of the prevalence of cholera in various parts of Marwar for more than a month before the disease made its appearance in Ajmeer.

The first case occurred here on the 26th of June, the second case on the 28th; both terminated fatally in a few hours. They were treated in the dispensary, and I made every enquiry with a view to tracing the introduction of the disease to stray pilgrims from Hurdwar, but failed to do so. No fresh case occurred for ten days, until the 9th July, when three more cases occurred, of which two proved fatal, and one recovered. Again there was lull until the 15th July, when there were two cases. Between the 15th and the 30th there were twenty-two cases. From the 1st August to the end of September, 218 cases occurred.

Although the epidemic continued in the city from the 9th July to the 30th September, only 247 persons were attacked, out of which number sixty-five died, or 26·31 per cent.

As there was no particular atmospheric disturbance when the

\* This snake died on the 17th, without any obvious cause.

first two cases occurred, and as so many days elapsed without any fresh ones, I was inclined to consider them sporadic, similar to those which occur during most rainy seasons. Soon, however, I had reason to alter my opinion.

On the 2nd July, with the new moon, we had a storm from the South-East, (the prevailing winds had been West and South-West.) During the night the wind veered round to the West, and we had a thunderstorm with vivid lightning, and four-tenths of an inch of rain. Between the 2nd and the 9th, on which day the epidemic commenced, there were several thunderstorms with vivid lightning, but little rain. From the 9th to the 19th there was little rain to speak of. On the latter day there was a severe thunderstorm with heavy rain, and with it an increase of cholera. I observed on several occasions that, after a heavy fall of rain, a greater number of persons were attacked. This was particularly noticeable after a fall of three inches and one-tenth during the night of the 17th August. On that same night there was an increase of cholera in the city, and a case of choleraic diarrhoea occurred in the European detachment quartered in the fort.\*

On the 20th two cases of malignant cholera occurred in the fort, both of which terminated fatally in a few hours, and immediate steps were taken to remove the detachment. The Deputy Commissioner (Lieutenant-Colonel Davidson) at once placed the residency, distant about two miles from the fort, at the disposal of the Officer Commanding, and the men were moved down there on the 21st. Before they left the fort, another man was attacked with choleraic diarrhoea, but recovered, and there were no more cases after the removal to the residency.

The men of the detachment had been strictly prohibited for some time from going into the city, and had not come in contact with any cholera patient.

From the 15th August to the 29th of the month, there was rain daily, and a steady increase of cholera. On a decrease of rain during the month of September, the disease gradually subsided.

I could not, in any instance, connect the appearance of the malady with the advent of pilgrims returning from Hurdwar.

I do not consider the disease altogether to have been of a very virulent type, though many of the cases exhibited all the worst symptoms of malignant cholera: the countenance rapidly assuming a death-like appearance; eyes sunken, with a dark livid circle round the eyelids; severe cramps, chiefly in the larger muscles of the extremities; urgent thirst; vomiting and purging, the discharges resembling rice-water; pulse feeble and fluttering, and soon sinking to below zero; tongue clammy, and cold to the touch; extremities cold, livid, and corrugated, not unlike those of a drowned man; a sense of burning heat at the pit of the stomach; and total suppression of urine.

In some few cases (and those were among the very worst) there was very little vomiting and purging. The patients, previously in health, were struck down suddenly, as though by lightning, and died in a few hours.

The jail, with an average daily strength of 340 prisoners, remained perfectly free from cholera during the whole time. I adopted the precaution of fumigating the barracks daily. Fires were also lit daily in various parts of the jail compound, and the conservancy arrangements were well looked to.

The detachment of the Ajmeer and Mairwara Battalion at Ajmeer quite escaped the disease up to the 7th August, when a sepoy belonging to the *new* detachment from Beawur was admitted, and died in a few hours. I was not aware that the detachment was to be relieved by one from Beawur (where cholera was also prevalent), or I would have strongly advised

the contrary, as I had previously done with regard to the European detachment. No further case occurred in the Ajmeer and Mairwara detachment until the 28th August, when a sepoy was admitted, who died on the 30th. This was the last case among the Beawur men.

Wood and dried cowdung fire were burnt daily in the lines and in the men's huts, and with beneficial results.

During the present epidemic, none of the hospital establishments was affected with the disease, although in constant communication with the sick and dying. In the epidemic of 1861, which was much more severe than the present, though it extended over a shorter period, three of the hospital establishments were attacked. They all recovered.

That cholera is a disease caused in the first instance by an atmospheric poison, is, I think, generally admitted; and that it is communicable in a limited sense, I also believe, one of the circumstances which concur to augment its intensity. "Some," as Doctor Watson very truly remarks, "are *beyond human control*; some may be obviated by the efforts of society as a body; some may be got rid of, or avoided, by each man for himself. We cannot regulate the temperature of the air, nor determine its barometrical pressure, nor influence on any large scale its movements. The removal of decomposing filth, the promotion of ventilation by opening up close and crowded neighbourhoods, the enforcement of effectual drainage, the constant supply of pure water, the prohibition of intramural sepulture; these are practicable objects fairly within the scope of legislative action."

The treatment employed was various. Calomel and opium was given, and the following mixture:—

Spt. ammon. aromat.	... ʒxl.
„ æther sulph.	... ʒxxxv.
Vin. opi	... ʒxxx.
Mist. camph.	... f ʒjss.

To be repeated every half-hour if necessary. After the third dose omit the opium. This combination possesses three essential qualities: it is at once stimulant, sedative, and anti-spasmodic.

Pills, composed of black pepper, opium, and asafetida, were distributed to the different Police Stations throughout the district, with instructions as to how they should be given, and they were reported to have been beneficial in a large number of cases. Similar pills were distributed throughout the city.

In many advanced cases I gave the following with advantage:—

Liquor ammonia.	
Spirit Cinnamomi	... aa ʒxx.
Mist. Camphor	... f ʒjss.

Every twenty or thirty minutes.

Chloric æther and chlorodyne I also found very serviceable, with and without brandy.

Where the thirst was urgent, I allowed the patient to drink pretty freely of either cold water or spearmint water. Soda draughts, frequently repeated, were found most grateful.

Mustard plasters and turpentine frictions were freely used. Liquor lyttæ, applied to the pit of the stomach, had the effect, of checking the vomiting in several instances.

Secondary fever occurred in a few cases, and was treated on the principles applicable to fever.

In the diarrhoea which was prevalent at the time, I found the following mixture very serviceable:—

Chalk mixture	... f ʒvjss.
Aromatic confection	... ʒii.
Tincture of catechu	... f ʒi.
Battley's sedative solution	... ʒxxx.

Two table-spoonfuls to be taken after each loose motion.

The native doctors, and hospital establishment generally, were indefatigable in their attendance on the sick,

AJMEER, РАПРОТАНА, December, 1867.

\* A heavy fall of rain is said to purify the air by dissolving the poisonous exhalations contained in it. But it also sets in motion the pent-up gases of cesspools and noxious soils. Sulphuretted hydrogen, evolved on a large scale, would doubtless be a cause of cholera.