

rabbit that was injected with the dark mixture of cobra poison and liquor potassæ was quite unaffected by the operation. . . . The reader will see at once that in the effects of the liquor potassæ Dr. Shortt seems to point if not to an antidote yet to something like one."

A case is related from the *Madras Monthly Journ. Med. Sciences*, in which the potash treatment proved successful. This is the third successful case under this treatment. Dr. S. states: "Long before I had the opportunity of testing the action of the liquor potassæ on the human subject, I ascertained the property it possessed of neutralizing snake poison, and the difficulty I experienced was to introduce some means to expedite its action in the living blood. After repeated trials and experiments, I found that brandy as a diffusible stimulant roused the nervous system, excited the circulation, and thus carried the potash into it as rapidly as possible, and enabled it to overtake and neutralize the poison in the blood. The secret of success, then, consists in bringing the patient's system rapidly under the influence of the brandy—or in other words to make the patient *drunk* as speedily as possible, and maintain this effect for some time after. During the first forty-five hours of the patient's stay in hospital he took seventy-two ounces of brandy and four ounces and a half of the liquor potassæ by the mouth, fourteen ounces of brandy and three ounces and a half of the liquor potassæ by means of enemata through the rectum, and four ounces of the liquor potassæ was used in the bath he had. In all eighty-six ounces of brandy, and eleven ounces of the liquor potassæ were used in this case!"

62. *Treatment of Snake-bite by Artificial Respiration.*—Mr. VINCENT RICHARDS records (*Indian Medical Gazette*, May 1, 1873), a series of eight experiments instituted on dogs, to test the value of artificial respiration, as suggested by Dr. Fayer, in cases of snake-poisoning, and he thinks the results, though not absolutely successful, are very encouraging. In one case the heart's action was maintained for 10 hours, and then ceased only on the discontinuance of the artificial respiration; and in another, the heart was kept beating for 24 hours and 35 minutes, sensibility being restored after it had been completely lost.

The following is his explanation of the physiological action of snake-poison. When snake-poison is injected into the areolar tissue, as is usual in the case of a bite, absorption gradually takes place. When the poison reaches the lungs, it appears to excite the pneumogastric nerve, and through the medulla and spine the phrenic and intercostal nerves, principally leading at first to an accelerated action of the respiratory muscles, and afterwards, as a larger quantity of poison becomes circulated through the lungs, and the stimulus to the nerve-centres is augmented, to paralysis of them. Vomiting, which is a frequent, though not constant, symptom, probably arises from this irritation of the pneumogastric nerves. The medulla oblongata and spine are, indeed, primarily affected, and it is only as a secondary effect that the cerebral ganglia and cerebrum are involved. Presuming this to be the physiological action of the poison, it follows that a person fatally bitten dies from asphyxia produced by paralysis of the motor and respiratory nerves. The indication of cure, provided the effect of the poison on the nerve-centres is not permanent, is therefore artificial respiration. Moreover, if elimination of the absorbed poison can go on, as appears to be the case, we have good reason to hope for favourable results. When, however, the amount of poison injected is overwhelming, little, I think, can be hoped for from the treatment. That an animal may be affected even to convulsions, and yet ultimately recover without treatment, I have already shown (Fayer's *Thanatophida of India*, p. 127), and I certainly think that when the quantity of poison injected into the areolar tissue would, under ordinary circumstances, be just sufficient to kill, artificial respiration, if properly maintained, might save life, as it does in the case of curara poisoning.

I believe it was this latter fact which first led Dr. Fayer to make a trial of artificial respiration in snake-poisoning, and the subsequent encouraging results which he obtained induced him to suggest its adoption in such cases.