ADDITIONAL EXPERIMENTS
ON THE
POISONOUS EFFECTS OF COAL-GAS
UPON THE
ANIMAL SYSTEM.

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IN the paper which I brought under the notice of the Society a short time ago upon this subject, the experiments were made with the gas as it issued from the main, but in those now to be related, common gas, diluted with atmospheric air in different proportions, was used. The experiments were made with Mr. Henry Banister, at the works in Horseferry Road, on February 7th and 14th, 1862.

Experiment I.

A gas-holder, capable of containing ten cubic feet of gas, having been filled with common coal-gas and atmospheric air in the proportion of one half of each, and a rat placed under a bell-glass, twelve inches in diameter, and six high, the contents were passed into it in the way described in the former experiments. The respiration became hurried, but we saw no gasping like that which took place during the previous observations. The head dropped in one minute, and the animal became insensible, with slight convulsion, in

one minute and a quarter, eyes staring as before; a spasmodic jerk of the body upwards occurred in two minutes, and death supervened in two minutes and a half. The surface of the skull was intensely red, without congestion of the substance of the brain. The blood fluid, and of a lighter colour than in the other dissections. Lungs collapsed, with redness of the pleura, excepting a darkish patch on the right side anteriorly, like that produced by smoke.

A rat, killed on February 6th, by common gas, was then examined twenty-four hours after death, to see if any material alterations could be detected between the post-mortem appearances found in it and in those examined immediately after death; still they were identical.

Experiment II.

After filling the gas-holder with one fourth common gas, and three fourths atmospheric air, the mixture was supplied to a rat placed under the same vessel. The respiration became hurried in three minutes, and the head dropped in five minutes, slight and repeated spasmodic action of the diaphragm in six minutes, which lasted five minutes more, when death followed.

The brain and lungs presented similar appearances to those described in the former experiments; but a smoky-looking spot appeared on the lower part of the right pleura, as in the last observation. Heart full of fluid blood, and not so dark-coloured as before.

Experiment III.

The gas-holder was filled three times, during this experiment with atmospheric air and common gas, the latter being in the proportion of one fifteenth. Hence thirty cubic feet of the mixture were passed into the vessel containing the rat. It fell in six minutes, and plunged at the end of eight minutes; the respiration was hurried in eight minutes, with another spasm, twitching of the left ear; the hurried

respiration continued, and the animal was thrown on the left side in half an hour and five minutes, the fur becoming elevated. The rat was taken out alive at the end of an hour. The quick respiration continued until the end. When placed in the open air it gasped and raised the head spasmodically while lying on the left side, yet ultimately recovered. Time did not permit me to continue this experiment; otherwise, I believe, that the rat would have died; indeed, it is probable that death would have taken place within the hour had the gas-holder been larger. We therefore determined to make another experiment with the same proportions of gas and air. The necessity of filling the apparatus twice after the experiment had begun gave two intervals for the animal to recover itself in some degree.

Experiment IV.—February 14th, 1862.

This experiment was made with the same proportions of gas and air as in the preceding one, but a gas-holder containing a much greater quantity was employed. The rat on being placed under similar circumstances, soon began to pant very fast, the head fell with inclination of the body to the right side in ten minutes, the head was subsequently raised and fell, which was followed by two springs of the body; sharp twitches of the body and left ear took place at the end of seventeen minutes, when the animal seemed to be insensible, with the eyes open. We observed a repetition of these symptoms in twenty-two minutes, and again in half an hour and three minutes. In forty-one minutes the respiration became laborious, when death occurred, twenty-five cubic feet of the mixture, or five cubic feet less than in the last experiment having been used. The eyes were open, and the surface of the skull intensely red. The brain congested, the blood being fluid and bright coloured. The pleura of a bright red colour, and the right side of the heart distended with darkish fluid blood. No redness in the trachea.