FATAL POISONING BY CARBON MONOXIDE.

By Prof. W. P. Mason.

In Troy, N. Y., on January 6, 1887, owing to a break in the street mains, a quantity of "Fuel Gas" (see analysis below), passed beneath the frozen crust of earth, and found its way into the adjoining houses. Three deaths, and many more or less serious illnesses, resulted.

The following points, from the testimony of the physicians who made the autopsis are to be noted :

The expressions of the deceased were placid. One victim, an old woman, was found seated in a chair holding her false teeth in her hand. The second, also a woman, lay upon the floor. The third, a man, sat upright on a lounge, his head reclining on his shoulder. The fire was burning in the stove, and the lamps were still burning on the table. When found, death had not been very recent, as "*rigor mortis*" was fully developed.

Very searching autopsis were made, with the result of finding nothing whatever abnormal, with the exception of the bright cherry-red color of the tissues, and the vivid redness and lack of coagula in the blood.

Upon opening the chest cavity the physician bent forward and took one or two long whiffs for the purpose of determing the presence of any odor. Almost immediately he was seized with giddiness and great oppression in the epigastrium, so much so that he had to discontinue his work for half an hour. The effects did not finally wear off until after an interval of about twelve hours.

The painful oppression in the chest, the giddiness and the subsequent headache experienced by this physician, call most forcibly to mind the symptoms described by Sir Humphry Davy, when he so rashly experimented upon himself with carbon monoxide.

A lawsuit naturally growing out of these cases of poisoning, I was called upon to give the chemical constituents found in the said

"Fuel Gas," and the results are appended. I also experimented upon animal life with carbon monoxide mixed with air, obtaining results confirmatory of observations already made, that death usually takes place very quietly, although occasionally with convulsive movements. Chickens and rats were the two forms of life employed.

Blood, treated with carbon monoxide, I found to assume a bright red, almost carmine, color, which did not alter on exposure to air for a number of days.

Finally, in February, 1888, a bottle of blood taken from the heart of one of the victims at the time of the autopsy, was submitted to me for examination. The bottle was closed with a tight cork. Although over a year old, and possessing strong odor of decomposition, the color still remained of the brilliant, vivid red noted at the time of taking the specimen. Under the microscope but very few corpuscles remained to be seen, their structure having almost completely broken down.

Examination by the spectroscope revealed the two absorption bands near the line, characteristic of the presence of carbon monoxide in combination. These bands, although very like those indicative of oxy-haemoglobin, may yet be readily distinguished by their location only, particularly if a sample of blood artificially treated with carbon monoxide be at hand for purposes of comparison.

The space between the bands is, moreover, much less clearly lighted than in the case of oxygenated blood. As a confirmatory test, the blood under examination was treated with solid potassium sulphide, and the absorption bands found unchanged thereby—the bands of oxy-haemoglobin, as is well known, change under such treatment to the single dark band midway between the positions of the former ones.

What is of special interest in this case is the ready detection of carbon monoxide in the blood after so long an interval of time.

At the present moment, nearly two years from the date of the accident, the blood still retains the characteristics noticed when first examined.

The analysis of the Fuel Gas by volume is :

CO_2	5.0 per cent.
O	0.5 "
CO	37.5 "
CH_4	.9 "
H	48.0 "
N	7.1 "

Such gas supplied to consumers is practically odorless.

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METHOD OF DETERMINING INDIGOTINE FOR COMMERCIAL PURPOSES.

By F. A. OWEN. (Communicated by A. H. SABIN.)

Shave from the sample two or three grms. fine enough so that 1 grm. can be weighed with exactness ; place this 1 grm. on a watch glass and dry at 100° C. When dry, transfer it to a glass mortar and grind as fine as possible dry, then add water and grind to a very thin paste, which is then washed into a 250 c.c. flask. To this add 3 grms. zinc dust and about 6 grms. NaOH, and fill a little above the mark, as the volume diminishes, in an hour or two. The reduction takes place in half an hour to two hours ; the flask should be shaken occasionally and when the solution has become green the reduction is complete. If allowed to go too far reddish or brownish streaks appear, which indicate a loss of indigotine. Hydrogen is not given off until the reduction is completed, and froth indicates too much zinc. When the reduction is complete, draw off 50 c.c. of the clear liquor, let it stand exposed to the air half an hour, acidify with HCl, filter through a carefully washed filter, dry at 100° C. and weigh. It is not necessary to take any special care to prevent absorption of moisture in the balance pan. Indigo often loses 20 per cent. in drying, and dry indigo is of good quality if it yields 60 to 62½ per cent., but samples are met with yielding 80 per cent. after drying. The results of this method are in agreement with those obtained in a lime and copperas vat under good management.