

Here then is a curious state of affairs—when fuels burn, there seems to be loss in weight; but when metals burn, there is very evidently gain in weight, and, therefore, it does not seem as though the two processes were similar and could be explained in the same way.

But if we pay a little closer attention to just what takes place, we shall find that we have made one of our experiments incompletely. You have often noticed that when the chimney is put on to a lighted kerosene lamp it becomes dimmed, or “steamed,” for a while, and a careful experiment shows that this is really due to tiny drops of water being deposited on the cold glass.

EXPERIMENT.—Light a candle and invert over it a dry, empty glass cylinder or bottle. Moisture will be deposited on the inside of the cylinder. It will soon disappear, owing to the warming up of the cylinder.

Further, someone discovered that this steam was not the only thing given off from the flame, but there was also produced a gas that would turn lime-water milky. This gas has been named carbon dioxide—we shall see why later.

EXPERIMENT.—If after performing the experiment just described above, the cylinder be removed from the candle, some lime-water be poured into it and it be quickly covered with the hand, or otherwise, and then shaken, the lime-water will become milky.

Now, in our experiment of weighing the burning candle, we did not catch the steam and carbon dioxide that were produced and keep them on the balance—it was something like trying to weigh a basket of kittens with the kittens jumping out one after the other and running off. Fortunately, a substance called caustic soda has been discovered which has the power of absorbing steam and carbon dioxide (holding the kittens); so, if we repeat our original experiment with the candle, using caustic soda in the proper way, we find that there is a gain in weight during the burning of a candle