

forced to the conclusion that at the end of the experiment we are weighing more matter than we did in the beginning: that the water and carbon dioxide are the materials of the candle *plus* something else, and that the white ash formed when the magnesium burns, or the hammer scale formed on the iron, is the magnesium or the iron *plus* something else:

Hammer scale = iron + something else.

We at once want to ask two questions about this something else: What is it? Where did it come from? The second, being the easier, we will answer first.—It came from the air. We have two reasons for believing this: it cannot come from anywhere else; and, if we try to perform the experiment in a vessel from which all air has been pumped out (of course, making special arrangements for trying to light the candle or the magnesium), no chemical change takes place, nor any change in weight. (Compare, also, Lavoisier's experiment described below.)

It was much more difficult to answer the question: What is this something else? And for a long time it was very aggravating to think that water and carbon dioxide and magnesium-ash and hammer scale and a great many other things had this something locked up in them, but would not let the secret out!

An experiment has been defined as "a question put to nature in a language which she understands and in which she is capable of answering." And, at last, after someone had found the proper language in which to ask the question, nature answered what the something was: the proper experiment was hit upon, and it happened in this way. As we have already seen, iron, when highly heated in the air, forms a black calx, lead a brownish-yellow one, magnesium a white one, and so on. Mercury, if heated to the right temperature, very slowly forms a red calx (several days' heating is necessary to produce a satisfactory result). Now, there was a