

### A SIMPLE ILLUSTRATION OF THE CONSERVATION OF ENERGY.

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The other day when blowpiping some silver nitrate on the "charcoal splinter," I observed what seemed to be a good, although simple, illustration of the law of the conservation of energy. It is possible that the phenomenon has been observed many times before, but I cannot recall any instance of the particular explanation which I believe to be the correct one having been offered for it.

As possibly some readers may not be acquainted with the reduction process which is carried on by means of a charcoal splinter, it may be well to give a brief account of it before proceeding to the particular phenomenon and the offered explanation.

To prepare a charcoal splinter, the head of a common match is broken off and the wood is then smeared for about an inch of its length with ordinary washing soda melted in the flame of a spirit lamp. The smeared end is then gently heated in the flame for a few moments until a charred mass of wood and soda is obtained. Upon this is placed carefully a small mass of the particular substance to be reduced, mixed with some fused soda. The blowpipe is then directed on the flame, the mass being held in the "reduction" part of it. In a few minutes separation of the elements is obtained, and in the case of silver nitrate a beautiful small sphere of metallic silver is left upon the splinter.

But in the first few seconds of the operation, the unsmeared part of the match tends to burst into flame. Once, however, that the reduction process is fully started, this does not occur. This is the phenomenon. What is the explanation?

It is possible that in some instances, and then in part only, it is due to the formation of combustible gases at the outset which cease to be formed as the reduction proceeds. But I think the more general explanation of the fact is to be found in the consideration that during the first few seconds of the blowpiping, the only work that is done by the flame is that of raising the temperature of the mass and driving off moisture—comparatively light work