in some quarters, and we must proceed to furnish the proof of it. But we must first devote a few words to each of the two laws.

The *law of the "persistence"* or *"indestructibility of matter,"* established by Lavoisier in 1789, may be formulated thus: The sum of matter, which fills infinite space, is unchangeable. A body has merely changed its form, when it seems to have disappeared. When coal burns, it is changed into carbonic-acid gas by combination with the oxygen of the atmosphere; when a piece of sugar melts in water, it merely passes from the solid to the fluid condition. In the same way, it is merely a question of change of form in the cases where a new body seems to be produced. A shower of rain is the moisture of the atmosphere cast down in the form of drops of water; when a piece of iron rusts, the surface layer of the metal has combined with water and with atmospheric oxygen, and formed a "rust," or oxyhydrate of iron. Nowhere in nature do we find an example of the production, or "creation," of new matter; nowhere does a particle of existing matter pass entirely away. This empirical truth is now the unquestionable foundation of chemistry; it may be directly verified at any moment by means of the balance. To the great French chemist Lavoisier belongs the high merit of first making this experiment with the balance. At the present day the scientist, who is occupied from one end of the year to the other with the study of natural phenomena, is so firmly convinced of the absolute "constancy" of matter that he is no longer able to imagine the contrary state of things.

We may formulate *the "law of the persistence of force"* or *"conservation of energy"* thus: The sum of force, which is at work in infinite space and produces all phe-