

## THE LAW OF SUBSTANCE

and, after a general application of the balance, became the basis of exact chemistry. On the other hand, the more recondite law of the persistence of force was only discovered by Mayer in 1842, and only laid down as the basis of exact physics by Helmholtz. The unity of the two laws—still much disputed—is expressed by many scientists who are convinced of it in the formula: "Law of the persistence of matter and force." In order to have a briefer and more convenient expression for this fundamental thought, I proposed some time ago to call it the "law of substance" or the "fundamental cosmic law"; it might also be called the "universal law," or the "law of constancy," or the "axiom of the constancy of the universe." In the ultimate analysis it is found to be a necessary consequence of the principle of causality.\*

The first thinker to introduce the purely monistic conception of substance into science and appreciate its profound importance was the great philosopher Baruch Spinoza; his chief work appeared shortly after his premature death in 1677, just one hundred years before Lavoisier gave empirical proof of the constancy of matter by means of the chemist's principal instrument, the balance. In his stately pantheistic system the notion of the *world* (the universe, or the cosmos) is identical with the all-pervading notion of *God*; it is at one and the same time the purest and most rational *monism* and the clearest and most abstract *monotheism*. This universal substance, this "divine nature of the world," shows us two different aspects of its being, or two fundamental attributes—matter (infinitely *extended* substance) and spirit (the all-embracing energy of

\* Cf. *Monism*, by Ernst Haeckel.