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The Philosopher's Stone.

(Continued from last issue)

BUT long before this, keen visioned men began to see the fallacy in the accepted theories of the composition of substances,—and an inductive method of investigation slowly replaced the *a priori*. Roger Bacon (1214-1284) realized that "argument shuts up the question and makes us shut it up too; but it gives no proof, nor does it remove doubt and cause the mind to rest in the conscious possession of truth, unless the truth is discovered by way of experience." In his advocacy of the inductive method in science he anticipated his great namesake, Francis Bacon. Kunkel (1630-1702) writes:—

"I, old man that I am, occupied with chemistry for sixty years, have not yet been able to discover what is their *sulfur fixum*, and how it forms a definite part of metal." A Boyle, in his *Sceptical Chymist* (1678), threw overboard the whole philosophical structure based upon imaginary elements, and declared:—

"It is now time to consider not of how many elements nature may compound mixed bodies, but (at least as far as the ordinary experiments of Chymists will inform us) of how many she *doth* make them up." His idea is that the elements are to be discovered by decomposing substances until substances were obtained which could not be further decomposed. This is the modern conception of the elements. It took a hundred years to dislodge the old idea, even after Boyle's clear definition. Lavoisier's convincing statements, closed the history of the ancient theories of the composition of substances and laid the foundation for the triumphs of chemistry in the 19th century. For it is an undeniable fact that the rate of progress in discovery was enormously accelerated by the consistent use of the inductive method. But another factor quite as potent was the revival or adaptation by Dalton of the atomic theory of the Greeks. He converted it into a powerful instrument of research by using the modern definition of elements and by his discovery of certain laws of combination which enabled him to give the atoms definite *proportionate* weights. Hereafter, the atoms of the elements, and their groups, called *molecules*, became very real and constant things in the minds of chemists. Substances are definite in properties because their molecules are always the same for the same substance. Compounds are of definite composition because a molecule of any particular compound is always made up of the same atoms, which are invariable in their weights; and so on, until we have a complete theory of the composition of substances, founded on quantities exactly determined by the chemical balance.