of the laws of nature which has added to the working strength of a thousand millions of men the mightier power of steam (*a*), extracted from the buried ruins of primeval forests, their treasured elements of heat and light and color, and brought under the control of the human finger, and converted into a messenger of man's gentlest thoughts, the dangerous mystery of the lightning (*b*)?

How many questions have we asked—not always in vain—regarding the constitution of the earth, its history as a planet, its place in creation; now probing with sharpened eyes the peopled space around—peopled with a thousand times ten thousand stars; now floating above the clouds in colder and clearer air; now traversing the polar ice—the desert sand—the virgin forest—the unconquered mountain; now sounding the depths of the ocean, or diving into the dark places of the earth. Everywhere curiosity, everywhere discovery, everywhere enjoyment, everywhere some useful and therefore some worthy result. Life in every form, of every grade, in every stage; man in every clime and under all conditions; the life that now surrounds us, and that which has passed away;—these subjects of high contemplation have been examined often, if not always, in the spirit of that philosophy which is slowly raising, on a broad security of observed facts, sure inductions, and repeated experiments, the steady columns of the temple of physical truth.

Few of the great branches of the study of nature on which modern philosophy is intent were left unconsidered in the schools of Athens; hardly one of them was or indeed could be made the subject of accurate experiment. The precious instruments of exact research—the measures of time, and space, and force, and motion—are of very modern date. If, instead of the few lenses

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(*a*) The quantity of coal dug in Great Britain, in the year 1864, appears by the returns of Mr. R. Hunt to have been 92,787,873 tons. This would yield, if employed in steam-engines of good construction, an amount of available force about equal to that of the whole human race. But in the combustion of coal not less than ten times this amount of force is actually set free—nine-tenths being at present unavailable, according to the statement of Sir. William Armstrong, in his address to the meeting at Newcastle, in 1863.

(*b*) The definite magnetic effect of an electrical current, was the discovery of Oersted in 1819: Cooke and Wheatstone's patent for an Electric Telegraph is dated in 1837; the first message across the Atlantic was delivered in 1858. Tantæ molis erat.