hundred years the scientific investigation of *chemical* and *electric* phenomena has taught us to disentangle the intricate web of the elementary forces of nature, to lay bare the many interwoven threads, to break up the equilibrium of actual existence, and to bring within our power and under our control forces of undreamed-of magnitude.

3. Relation of science and practical life.

The great inventions of former ages were made in countries where practical life, industry, and commerce were most advanced; but the great inventions of the last fifty years in chemistry and electricity and the science of heat have been made in the scientific laboratory: the former were stimulated by practical wants; the latter themselves produced new practical requirements, and created new spheres of labour, industry, and commerce. Science and knowledge have in the course of this century overtaken the march of practical life in many directions.[1] A confused

ing the history of the learned societies as well as the rare cases in which highest scientific genius is allied with practical skill in the same person, whether the cultivation of research for its own sake should not preferably be kept distinct from its hasty application. This is the view held by many great thinkers abroad. In England the opposite view has frequently impeded the progress of pure science.

[1] A few examples may suffice. The discovery by Oersted and Ampère of Electromagnetism (1819, 1820) led at once to the idea of electrical telegraphy: the first telegraph over considerable distances was constructed by Gauss and Weber (see 'Wilhelm Weber,' Breslau, 1893, p. 26, &c.) The artificial preparation of an organic substance by Wöhler in 1828 led at once to many attempts at preparing expensive organic compounds—especially medical substances—by chemical synthesis. The occupation with this problem under A. W. Hofmann's instructions led Perkin in 1856 to the discovery of the first anilin colour (Mauvein, see 'Berichte der deutschen chemischen Gesellschaft,' No. 17, p. 3391). Leblanc's discovery how to make carbonate of soda from salt, for which a prize had been offered by the Paris Academy under Napoleon, led to the enormous development of the sulphuric acid industry in England and on the Continent. Liebig foretold in 1840 the recovery of sulphur from the waste of chemical works and the effect on the sulphur mines of Sicily, fifty years before this process was satisfactorily carried out (see Liebig's familiar 'Letters on Chemistry,' 1st ed., 1843, pp. 22, 31, &c.) But the greatest of all industries created in the laboratory was probably that of