

steady light on the vexed question of the constitution of matter. The great number of scientific names of the first order of merit concerned in these numerous discoveries marks the extraordinary fertility of the period.....

Of the twenty-five years just elapsed, it is not so easy to speak with precision. The voice of criticism may be fairly uttered with that reserve which every one must feel in speaking of his immediate contemporaries. Yet it may perhaps be stated without just cause either of offence or regret, that it has not on the whole been characterised by the full maturity of so many commanding minds. Of the great discoverers of the former period, several survived and continued their efficient labors during no small portion of the latter; and a few happily still remain to claim the respect and veneration of their disciples and successors. But the vast steps so recently made in optics, in electricity, in magnetism, in thermotics, and in chemical principles, tended of necessity to call forth such an amount of laborious detail in the defining and connecting of facts and laws, and the deduction of the theories started to explain them, as seemed to render fresh and striking originality somewhat hopeless, whilst they occasioned a vast amount of useful employment to minds of every order of talent. The undulatory theory of light, nobly blocked out by the massive labors of Young and Fresnel, has afforded still unexhausted material to the mathematician on the one hand, and to the experimentalist on the other; and ably have they fulfilled the double task, adding at the same time discoveries whose importance and difficulty would have made them still more prominent, had they not been the legitimate consequences of a still greater discovery already in our possession. Nearly the same might have been said for the sciences of electricity, electro-magnetism, and electro-chemistry, had not the comparative newness of the whole doctrine of these sciences, and the suddenness of their first rise, and, perhaps, still more, the appearance of a philosopher of the very highest merit, Mr. Faraday, who fortunately attached himself to this special department, made the last thirty years an almost unbroken period of discovery. Radiant heat, too, has been successfully advanced by labors comparable perhaps to those which marked its first rise as a science, and some other topics connected with heat have risen into great and practical consequence. Astronomy has been prosecuted with a systematic assiduity and success, especially at the British and Russian national observatories, which yields to that of no former period, whilst physical astronomy has been cultivated by methods of still improved analysis, and has achieved one triumph which France need not grudge to England, nor England to France,—so signal as to be placed by common consent in a position superior to any since the first publication of the theory of gravitation, more than a century and a half before. This was the prediction of the position in space of a planet whose existence was unknown except by the disturbance which it produced in the movements of another. Terrestrial magnetism has, for the first time, aspired to the rank of an exact science. In an illustrious philosopher of Germany, it has found its Kepler, and the combination of national efforts in collecting reliable data from the remotest corners of the globe is characteristic of the practical energy of the age. Pure chemistry has been cultivated with extraordinary assiduity; but though some general principles have emerged, none are comparable, from their importance, to the discovery of Dalton.....

It seems to me impossible to exclude from a review, however slight, of contemporary progress in the exact sciences, the advances which have accrued to them, both directly and, as it were, reflexively, by the astonishing progress of the me-