

theless, it may be feared that the double life which Sir John Lubbock led for some time produced that general debility under which he laboured for years before his death. At all events it may be said of him, as of many other men of energy, that had they tempered that energy, they would have lasted longer; but would they have been as useful?

Sir John Lubbock died at High Elem, Farnborough, Kent, on the 20th June, 1865, in his sixty-third year, universally respected and regretted.

MR. JOHN ISAAC HAWKINS, was born on the 14th March, 1772, at Taunton, Somersetshire, where his father exercised the calling of a watch and clockmaker. At an early age he left England for the United States of America, and entered the college at Jersey, Pennsylvania, as a student of medicine. His natural talent and inclination for mechanical pursuits, however, soon induced him to change his course of study, and to devote his attention to perfecting the mode of removing chemical and mechanical impurities from water, by filtration in contact with charcoal, &c. On his return to England he patented, and introduced to the public, a machine for taking likenesses in profile, from the size of life downwards. Combined with his talent for mechanical pursuits was that of a love for music. He had early in life mastered several musical instruments, and he now brought his ideas to bear upon their improvement, especially that of the pianoforte, which he commenced manufacturing under patents obtained by him. He also invented about this time, and some years afterwards manufactured, an instrument which he named the Claviole, or finger-keyed viol,¹ the scientific arrangements of which were so delicate and complete, that all the instruments usually composing a band were successfully imitated by one performer. His chief talent lay in inventing and improving upon the useful scientific contrivances for manufacturing processes, among which may be named the refining of sugar, by Howard's process, in the prosecution of which his acquaintance with the valuable properties of charcoal, as a purifying medium, was of great assistance, and he was induced to adapt it, with other combinations, for that purpose; and several years of his life were devoted to the erection and fitting up of sugar refineries, both at home and abroad.

During his foreign journeys, nothing that was new escaped his observation, and he was able to use the processes, or to quote their use most opportunely. For instance, in the course of a discussion at the Institution of Civil Engineers in 1844, when whole timber

¹ Vide "The Mechanics' Magazine," vol. xliii.

scaffolding was mentioned as a novel introduction, he stated, "That the scaffold used at Vienna, for the erection of any building of importance, was always constructed of whole timbers, secured together by 'dogs,' and that in 1827 he superintended the erection of an extensive sugar-house at Vienna, where such scaffolding was used."¹

His co-operation was frequently sought for in works where ingenious contrivances were requisite; and he was associated with an attempt, made by Mr. Vesey in 1808, to drive a tunnel under the Thames, by sinking cylinders of brick, set in Roman cement, and placed in excavations made in the bed of the river. When the cylinders were deposited at the required depth, they were covered in, and their sides were opened, to effect continuous communication throughout. The tunnel was not, however, completed, owing to want of funds, and of unanimity in the Board of Directors.

His intimate acquaintance with physical science, as well as his correct knowledge of all the improvements in arts and manufactures which had taken place for many years, eminently qualified him for the profession of a patent agent and consulting Engineer, which he exercised for many years, bringing his varied experience to bear upon, and complete for practical purposes, the crude ideas of inventors.

His own improvements of useful instruments were very numerous, and among them may be mentioned the Pentagraph, an instrument for giving any number of copies of a letter, or other document, at the time of writing the original; this was somewhat generally used, until it was superseded by Wedgewood's carbonic manifold writer, and by the modern forms of copying-presses. The ever-pointed pencil, and the everlasting gold pen, are among his useful, though minute inventions; for the latter he took the residuum found after dissolving platina, and, with the iridium, he skilfully pointed the gold pens.

He had for many years entertained the idea of returning to the United States, in order to perfect and to patent several new inventions; as he imagined that the expense of patents in Great Britain, at that time, pressed with undue severity upon inventors, since, unless they were prepared to incur a large expense for a problematical return, they could not exhibit their unpatented inventions, except at the risk of being deprived of them. On the other hand, he thought that the moderate charge to citizens of the United States of America, enabled a poor inventor to take out a patent there without the aid of a capitalist, and thus to convert his inventions into property, which he might take to market, and run no risk of losing his right. Being assisted by a few of the

¹ *Vide* Minutes of Proceedings Inst. C.E., vol. iii., p. 209.

older members of the Institution of Civil Engineers, who knew him well and estimated his uprightness and simplicity of character, as well as the ingenuity of his mind, he carried this intention of emigration into effect in the autumn of 1848, and in a farewell letter he said, "The Creator has constituted me an inventor, and I consider every useful invention given me, as a commission from Him, in trust, for the benefit of mankind; and I should deem myself guilty of a breach of that trust, were I not to use every reasonable exertion to carry the same into effect, as long as it can afford me due support. Society is now enjoying many comforts and conveniences from my inventions, while I have great difficulty in procuring common necessaries."

Nothing was heard of him, after his arrival in the United States, until quite recently, when his death was reported to have occurred at Elizabeth Town, New Jersey, U.S., on the 28th of June, 1855. It is feared that his sanguine anticipations of the States being a land of promise for inventors were not realized, and that he might eventually have been really better appreciated, had he remained in England. He joined the Institution of Civil Engineers as a Member on the 27th April, 1824, was a constant attendant at the Meetings, taking part in the discussions, and always feeling a warm interest in the welfare of the society.

MR. JOHN LEWIS was born on the 20th of April, 1825, in the parish of Vaynor, county of Brecon. His parents were small but respectable farmers; and he received his education in a private school in the village of Cefn-Coed, which adjoins the now important town of Merthyr Tydvil. At an early age he exhibited a great aptitude for drawing, and was considerably in advance of those of his class in educational attainments. At seventeen years of age he had the good fortune to be placed in the drawing-office of the Dowlais Iron works, where he soon distinguished himself as a draughtsman, and obtained a good knowledge of Mechanical Engineering. He was afterwards removed to the mining-office of the same works, and was for a considerable time Surveyor of the extensive mining works of the Dowlais Company, under Mr. J. Dickinson, the Coal Viewer (now Inspector of Coal Mines for the Manchester District), and in that capacity Mr. Lewis acquired an extensive and varied knowledge of mining operations. He left the employ of the Dowlais Company in 1847, and undertook the superintendence of the erection of the Briton Ferry Iron works, Glamorganshire, which he completed to the satisfaction of the proprietors. In 1851 he commenced business on his own account, as a Mining Engineer and Surveyor, and from that period to the time of his death there were but few works of magnitude in