The partnership with Ayrton was continued several years after their return to England in 1879. They were in the van of electrical progress, in some respects before their time—as in the case of Telpherage, which they developed in association with Fleeming Jenkin. Those were wonderful days: we were just learning to know and use electricity. A little later, Perry's house was often the scene of most stimulating debates, especially when Larmor and Lodge forgathered there with Fitzgerald, whom Perry adored.

Perry's best work was done at the Finsbury Technical College. Ayrton and I were called on to lay the foundations of the work of the City and Guilds Institute for the Advancement of Technical Education in October, 1879; we began in temporary quarters in Cowper Street, Finsbury. I found not only that plans were prepared for a separate chemical laboratory but also that steps had already been taken towards the erection of the building. I took exception to the scheme on the ground that more than a mere knowledge of chemistry would be required of the technical chemist of the future: that he must know something of the fundamentals of mathematics, of physics—especially electricity—and of engineering—drawing in particular. My view prevailed and we set to work to excogitate a practical programme and design a building. In 1871 we roped in Perry to our aid: our trio always fought like thieves over every detail but remained as one man throughout. The outcome was the present Finsbury Technical College and the original Finsbury scheme: I say "original" because our successors were never whole-hearted followers of our convictions and aspirations. This much I may assert as the last of the Finsbury Mohicans—we were in advance of our time and our fate has been the usual fate of pioneers and prophets. We cut the college adrift from all external examinations. We imposed an entrance examination on applicants. Not only was the course comprehensive but also the methods were special, practical and advisedly educative rather than informative; our students were young and their period of training was short but at its close, although they did not know a great deal, they had learnt to think for themselves and to do by themselves, so that they were mentally prepared to continue learning when left to their own devices. Now the college is to experience the fate of our scheme; it is said that it will be closed next year. When established it was the most original school in the country and it has been a remarkable success. We are a strange people: we seem never to know when we have hold of a good thing and cannot long maintain a consistent policy. In abandoning Finsbury the City and Guilds Institute signs its own death-warrant; but it has long been practically defunct, the men of imagination and outlook who founded it having bred no successors.

Perry did not leave Finsbury until 1896, when he became professor of mathematics and mechanics in the Royal College of Science, South Kensington. He had the advantage of being a practical engineer by training; this, added to his mathematical genius and his intimate knowledge of electrical science, not forgetting his literary proclivities, made him a man of unusual breadth and sanity of outlook. No special scientific achievement is to be associated with his name; his real interest lay in the work of education and he will go down to fame as an original and constructive teacher who laid the foundation of a new era. He made mathematical teaching practical and taught many who could never have mastered the abstract subject to use such knowledge and ability as they had with effect. As examiner in mathematics to the Science and Art Department he exercised a wide and beneficent influence on the teaching of this subject. His methods were not everywhere popular, but this was mainly because of the special demands their practice made on the intelligence of the teacher. As he more than once remarked to me, few really understood him. Still, the written word remains: Perry has left much on record which will be of service to a future, more appreciative generation.

H. E. A.

PROF. PERRY'S love of research and restless spirit of inquiry have inspired the lives of innumerable students who came under his influence. Who can measure what the nation owes to Perry for the intellectual gifts he distributed so freely to so many men? Who can measure the boundaries to which his influence will reach through the lives and activities of his students? The man who inspires is in time forgotten, but those whom he stimulates inspire others, so that his influence increases as time goes on. An engineering work like a fine bridge can be seen of all, and the builder is applauded and rewarded. The scientific spirit is apprehended by few, and those who possess it and spend their lives in the true service of the nation by cherishing it and by passing it on to others are unknown and unrewarded by authority, but are held in respect and affection by those who receive from them what so few are able to give. Perry gave lavishly, and his students responded with enthusiastic affection. He ranged wide in the regions of science. In Japan he and his friend and colleague Ayrton experimented furiously. Paper after paper came red-hot from their intellectual forge until even Lord Kelvin said that the pole of scientific research had shifted to Japan.

Finsbury Technical College was founded to do something in technical education which had not been done before. Perry and his colleagues, Ayrton and Armstrong, launched the college. They made it a pioneer in technical education. They made it world-famous. Everything which these men did was new, unorthodox, stimulating, and vastly interesting to the keen young men who flocked from the workshop to the college to hear and often to help them. Perry was unorthodox of the unorthodox. He taught his students to mistrust authority and to try things out for themselves.

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Perry will probably be chiefly remembered by engineers as the man who broke through the formal defences of mathematics and taught them mathematics through what they knew of machinery. His book on "Practical Mathematics," originating in his Finsbury course, has been translated into many languages, and many generations in many lands will therefore benefit from Perry's determination to teach his own students the fundamental truths of mathematics so well that they could use their knowledge as easily as they could use their mother tongue.

Perry continued his work as professor of mathematics and mechanics at the Royal College of Science, leaving Finsbury in 1896. In those days the professors at the Finsbury Technical College were expected to run an arduous day course, and in addition an evening course as well. His relief at the escape from this double duty was great. In more recent years he guided the fortunes of the British Association for the Advancement of Science as its general treasurer. Perry has done a great work, and his work will live after him.

W. E. D.

PROF. AUGUSTO RIGHI, FOR.MEM. R.S.

PROF. AUGUSTO RIGHI, who died suddenly on June 8 at seventy years of age, is said to have been appointed assistant to the professor of physics in the University of Bologna—his native city—at the age of twenty-one. In 1877 he was *Libero Docente*, and in 1880 was appointed ordinary professor at Padua, whence after a few years he returned to Bologna as head of the physics department.

Righi was a skilled experimenter and an industrious worker. His original investigations lay chiefly in the domain of electricity, magnetism, and light. One of his discoveries was the variation of the resistance of bismuth in a magnetic field, a phenomenon on which an instrument for measuring the intensity of a field has been based. He was led to this discovery by an examination of the Hall effect in different metals in the year 1883. His results were published in the *Journal de Physique* (2), 1883, p. 512, and in the *Comptes rendus*, vol. xcvii., p. 672, as well as in Italian; most fully in Bologna Acad. Sci. Mem., vol. v., 1883, pp. 103–26. An abstract was given in NATURE, vol. xxx., p. 569.

Righi's earliest papers appeared in 1873, and dealt with a variety of topics, many of them connected with electrostatic problems and voltaic electricity. One of the subjects on which at one time he laid stress was the dilatation of the glass or quartz of a Leyden jar, and of insulators in general, under electric stress—what he called "galvanic dilatation": see, for instance, *Comptes rendus*, vol. lxxxviii., 1879, p. 1262. He also examined the changes of length due to magnetisation, and discussed the phenomena of permanent steel magnets. About 1880 Righi began a long series of researches on electric discharge *in vacuo* and in air, and pursued the subject in various forms to the end of his life. He was much interested in photo-electric effects, and contributed some new facts to the discharge of electrified bodies by ultra-violet light. He failed to discover electrons, but he knew that carriers of negative electricity were liberated, and took steps to observe their trajectory in a magnetic field, thus exhibiting the phenomenon as a variety of cathode rays. He also found that the discharge could be stopped by an electric charge of inverse sign, constant in density for a given metal.

Righi was keenly interested in the work of Hertz, and corresponded with the present writer on the subject of electric waves. A special form of Hertz oscillator, known as Righi's pattern, consisting of a couple of spheres with adjacent faces immersed in oil and charged at the back from two other spheres, was used by some people, and is depicted as a form appropriate to wireless telegraphy in Mr. Marconi's first patent, though the connection of the outer spheres to an elevated plate and to ground respectively—a plan efficiently introduced by Mr. Marconi for practical purposes—really converted the spherical oscillator into nothing but a series of spark gaps. It is understood that Mr. Marconi had visited Righi's laboratory and seen his experiments on Hertzian waves, but was not one of his students. Righi, in his correspondence, frequently expressed surprise at the novelty attributed to the invention in its very early days by Sir William Preece and other English officials.

In the Memoirs of the Academy of Sciences of the Institute of Bologna, Righi expounded many of the new discoveries as they were being made in physics—among others an excellent and semi-mathematical exposition of the Zeeman phenomenon (see vol. viii., ser. 5, pp. 59–90, December, 1899). He also wrote on the equations of Hertz and their solution, in vol. ix. of the Memoirs of the same Academy, pp. 3–28 (February, 1901); and, again, on the electromagnetic mass of electrons in vol. iii., ser. 6, pp. 71–84 (February, 1906). These papers show that though chiefly an experimental physicist, he had a sound grasp of general theory, and must have had considerable influence in making known the work of British and other physicists to his countrymen. A memoir on the theory of relativity was contributed by Righi to the Institute of Bologna so recently as April 18 last (vol. vii., ser. 7, pp. 70–82).

An experimental paper of Righi's on the possible existence of magnetic rays, dated May 17, 1908, vol. v., ser. 6, of the same Memoirs, pp. 95–150, deserves mention, because of the cathode ray inquiry there described and the speculation based upon it. The subject is continued in vol. vi., pp. 45–64, and in vol. x., pp. 79–103, also in vol. i., ser. 7, pp. 3–36, where results are described for many different gases. It is taken up again, after a discussion of the paths of electrons in magnetic fields, in vol. ii., ser. 7, pp. 11–41.

Righi describes further experiments in vol. iii.,

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