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Lord Kelvin.[1]

THE hundredth anniversary of the birth of William Thomson, Baron Kelvin of Largs, was commemorated in Glasgow and elsewhere on June 25. Although Glasgow was the scene of Lord Kelvin's life-work, he was actually born in Belfast, where his father, James Thomson, was professor of mathematics at the Royal Academical Institution. The city of Belfast is, indeed, very proud of its association with the illustrious physicist, and an impressive statue of Lord Kelvin adorns its Botanic Garden, adjoining the Queen's University.

William Thomson was eight years of age when his father became professor of mathematics at the University of Glasgow, and the family exchanged Belfast Lough for the Clyde. Letters are still preserved which show Thomson's love of navigation and its problems, and how he tackled some of them in his youth with the help of his brother James, afterwards professor of engineering in the University of Glasgow. He was always a sailor at heart, and his name is one of the very few names of physicists which are familiar to mariners throughout the world.

Lord Kelvin's connexion with the University of Glasgow, which began in 1832 and was only severed by his death on December 17, 1907, witnessed an extraordinary series of changes in the status of science in the world's universities. In Glasgow, as elsewhere at the beginning of his career, "Natural Philosophy," as Dr. David Murray says, "was purely an Arts subject and was regarded as an instrument for what Francis Bacon terms 'that improvement of the understanding which results from the cultivation of natural knowledge, and that elevation of mind which flows from the contemplation of the order of the universe,' and was on the same footing as Logic and Moral Philosophy; it was not treated as part of a scheme for the training of specialists. This was certainly Professor Thomson's view, who held that Greek, as an instrument of culture and mental discipline, was an essential part of the Arts course and that every scientific man should have a fair acquaintance with it."

Lord Kelvin never went to school. All his education up to the age of ten was given him by his father, along with his brothers and sisters. He used to say that he never met a better teacher in *anything* than his father was in *everything*. At a dinner of the University of Glasgow Club in London, Lord Kelvin once said that the average boy should be able by the age of twelve to write his own language with accuracy and some elegance.

[1] "William Thomson, Lord Kelvin, 1824–1907: an Oration delivered in the University of Glasgow at the Commemoration on June 25, 1924, of the Centenary of Lord Kelvin's birth," by Dr. Alexander Russell. Pp. 22. (Glasgow: MacLehose, Jackson and Co., 1924.) n.p. "Lord Kelvin as Professor in the Old College of Glasgow," by Dr. David Murray. Pp. iv+22+4 plates. (Glasgow: MacLehose, Jackson and Co., 1924.) n.p.

He should have a reading knowledge of French and German, and be able to translate Latin and easy Greek authors. He should then study logic, in order to apply his words sensibly.

Lord Kelvin matriculated in the University of Glasgow at the age of ten, and at fifteen he gained a University medal for an essay on the figure of the earth. He entered Peterhouse, Cambridge, at the age of seventeen, and in 1845 was declared second wrangler and in the following year Smith's Prizeman. In this year, at the early age of twenty-two, he was elected to the chair of natural philosophy at the University of Glasgow. "Those," he said, "were the palmy days of Natural Philosophy—the pre-commissional days." They were the days when lectures were preceded by prayer, when the professor would "meet his classes" for two hours on five days of the week for six months, and would devote the rest of the time to original research, in which chosen students might take part as assistants. *Lehrfreiheit* was a reality then, and the professor might teach whatever seemed to him best for forming the character and stimulating the imagination of the students. There was no thought of training for manual dexterity, inventiveness, or practical research. "Science" had not yet arisen as a faculty to be cultivated for its own sake or placed on an equality with the *artes humaniores*. Had the commercial value and utilisation of science been an object of university training in 1846, William Thomson would, in all probability, not have accepted the chair. Yet he himself was a shining example of the economic value of scientific knowledge and invention based upon it. He made innumerable inventions, and from some of them he derived considerable wealth, which the poverty of his early days enabled him fully to appreciate.

The sixteen years from 1850, when a steam tug laid the first submarine cable between Dover and Calais, to 1866, when the first permanent cable was laid between Europe and the United States, showed Lord Kelvin in a new light. He formulated and expounded the theory of cable transmission, and when he became a director of the Atlantic Telegraph Company, he did the work of the "drummer boy" in steering the company through the crises produced by the repeated failures of the cables. "What has been done," he said to the shareholders, "will be done again." The 1865 attempt was a failure, 1800 miles of cable being left at the bottom of the sea. But in the summer of 1866 not only was a new cable laid, but the old one was also recovered and completed.

While his work on cables gave Lord Kelvin his knighthood and the freedom of the city of Glasgow, it gave the electrical world the mirror galvanometer and the siphon recorder. These were followed by the electrostatic voltmeter and the electrodynamic balance. Lord Kelvin was a convinced advocate of the metric system, and his strenuous partisanship stimulated his colleague, Prof. Macquorn Rankine, to write his ballad "The Three-Foot Rule," which begins:

Some talk of millimetres, and some of kilogrammes,
And some of decilitres, to measure beer and drams;
But I'm a British workman, too old to go to school;
So by pounds I'll eat, and by quarts I'll drink, and I'll
work by my three-foot rule.

Lord Kelvin's laboratory, or "experimental room," as it was called, was an entirely new departure, and was the earliest physical laboratory in Great Britain. His manner of lecturing has been much admired and much criticised. Some say he was always above the heads of his students, and that he could not conceive their being subject to error. Sometimes he would let a student work out a problem of mathematical physics in the class, and would himself write down what the student dictated. After he had covered the whole blackboard on one occasion, the bewildered student said, "I am afraid, sir, I do not see where I am going." "Neither do I, Mr. Gillies; you may sit down," and the professor then sponged out all the ridiculous operations he had written down. He would, however, not tolerate facetious or irreverent answers, and would reprimand them severely.

On another occasion he despatched two students to the top of the College tower to take some observation with an electrometer. They reported the result, but it was of the opposite sign to what Lord Kelvin had expected. The professor was nonplussed, and advanced all sorts of theories to account for the result, only to reject them all as inadequate. Next morning he said he had spent the night trying to arrive at some explanation, but had not succeeded. On the third morning he appeared radiant. "Gentlemen, I have it now; they turned the instrument upside down." "It was the last thing that occurred to him," says Dr. Murray, "that a student in the Natural Philosophy class in the University of Glasgow could do so stupid a thing."

Kelvin has often been likened to Helmholtz, and for some time, indeed, the two had similar eminence and standing in their respective countries. Kelvin's almost universal genius left a lasting impression on his age. His estimate of the age of the earth has been vastly extended by the discovery of radioactivity, and his bold conception of the vortex atom is no longer regarded as corresponding in any way to reality, but he was one of the mightiest physicists who ever lived—"the foremost Cambridge man of science since Isaac Newton, and the most distinguished of the professors of the University of Glasgow."