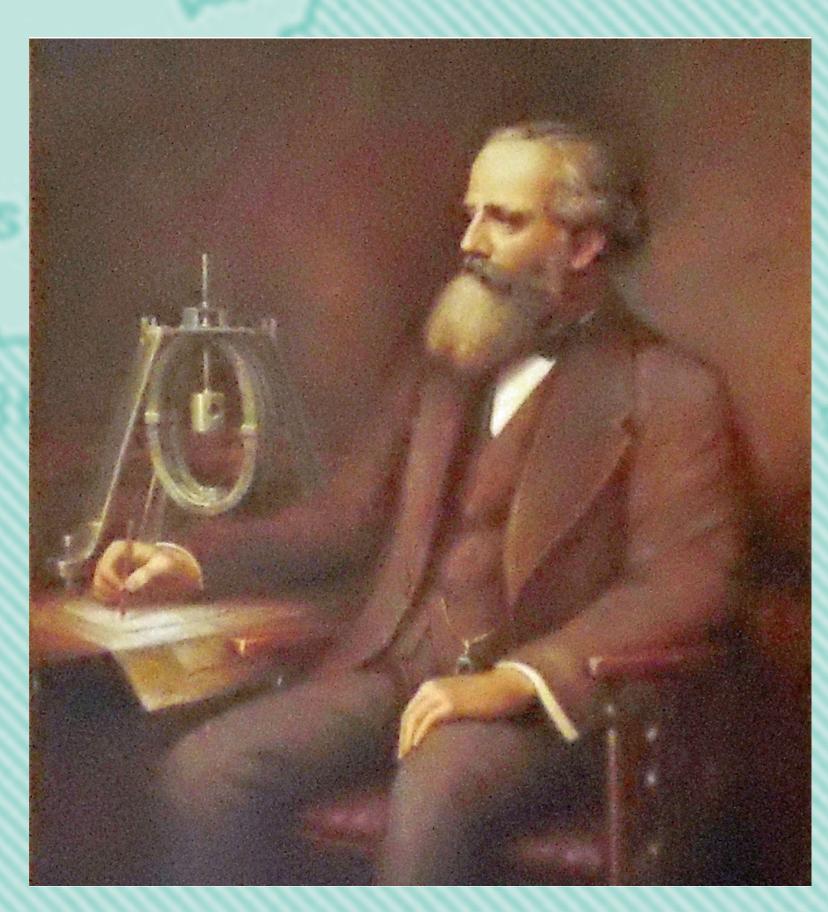
## Transatlantic Cables and the Ohm

Submarine cables, the first medium for intercontinental telecommunications, were pioneered by William Thomson (1824 – 1907), later Lord Kelvin, with Fleeming Jenkin (1833 – 1885), a school-friend of Maxwell who was the engineer in charge of international cable laying operations before becoming Regius Professor of Engineering at The University of Edinburgh.

In the 1850's, Michael Faraday (1791 – 1867) and Thomson demonstrated how the core resistance of the cable could limit messages to only one character every four seconds! It was therefore important to know exactly what its resistance was.

Jenkin, as secretary to the British Association Committee on Electrical Standards, appointed a committee including Maxwell to define the "Standards of Electrical Resistance".



Maxwell with his apparatus, courtesy IET Archives, London.

temperature rises. Hochin told me that Selenium increases like the metals. Are there any other non metallic bodies which do so? Have you seen Tait's results about the electromotive force of thermo-electric  $E=A (T_1-T_2) \{T_0-\frac{1}{2} (T_1+T_2)\}$ is true for several combinations. My dear Sir T<sub>1</sub>=temperature of hot junction After auch conversation in Mag.
I ful a very short statement of your method of measuring temperature by T<sub>2</sub>=temperature of cold junction To=temperature at which the metals are neutral to one another. Of course this formula tells us nothing about absolute zero because the sum of the coefficients of the temperatures in such factors are zero. I mention this because along with your results about resistance it helps to clear up the electric properties of metals, and perhaps you do not see the Edinburgh Proceedings. on heat which I am doing for Longmen Yours very truly J. CLERK MAXWELL mather belonging properly to electricity I should be glad of any suggestions on pp. 51-53 of the proof I send you. of your researches on resistance at high Lemperatures in my book on electricity in the chapter on the properties of metals as regards resessance. I have read office abstract affine Baherian Lecture had suppose the complete paper will not be and for some time, and was unfortunately not in London when

A letter from Maxwell to Siemens on the variation of resistance with temperature. On the left is Maxwell's original first page, while transcribed on the right is its conclusion, courtesy IET Archives, London.

I.de Guernesey

An instrument proposed by Thomson, as seen here alongside Maxwell, employed a magnet suspended within a spinning coil of standard wire. Maxwell and Jenkin led the experimental verification of the coil resistance. Their reports, published along with others including those of Charles Wheatstone and Werner Siemens, culminated in 1867 in the adoption of the unit that we now represent with the symbol  $\Omega$ , after the German physicist Georg Ohm.

In 1873, Maxwell and Jenkin each published their individual textbooks on electricity and magnetism.





