embrace the processes of the flow of heat, of electricity, magnetic and diamagnetic, and of fluid motion. "He called attention to the remarkable resemblance which the diagrams of flow bore to those which Mr Faraday had recently shown at the Royal Institution to illustrate his views regarding the action of ferro-magnetics and diamagnetics in influencing the field of force in which they are placed, and justified and illustrated the expression 'conducting power for the lines of force' by referring to rigorous mathematical analogies presented by the theory of heat."[1]

This view, which Thomson had merely shadowed forth, was more fully worked out by Maxwell in 1855 and 1861. His methods[2] were "generally those suggested by the processes of reasoning which are found in the researches of Faraday, and which, though they had been interpreted mathematically by Prof. Thomson and others, are very generally supposed to be of an indefinite and unmathematical character when compared with those employed by the professed mathematicians." The first addition which he introduced, by which he made Faraday's "lines of force" mathematically more definite, was to change them into "tubes of force," which represented not only the direction of force at every point of space, but also—according to their sectional dimensions—the intensity of the force. These tubes were supposed to be

49. His conception of "tubes of force."

[1] Abstracts of two communications to the British Association at Belfast in 1852, "On certain Magnetic Curves: with Applications to Problems in the Theories of Heat, Electricity, and Fluid Motion" (Reprint of Papers, &c., p. 519, &c.)

[2] James Clerk Maxwell "On Faraday's Lines of Force," 'Transactions of the Cambridge Philosophical Society,' 1855. See 'Collected Scientific Papers,' vol. i. p. 157.