history of this subject has been written from various points of view,[1] and angry controversies[2] as to priority

[1] The histories are mostly in German. I give the titles of the more important. Foremost stand the writings of Prof. Ernst Mach—viz., 'Die Geschichte und die Wurzel des Satzes von der Erhaltung der Arbeit' (Prag, 1872), incorporated in the author's 'Popular Scientific Lectures,' translated by Thomas J. M'Cormack, Chicago, 1894; and the same author's 'Die Mechanik in ihrer Entwickelung, historisch-kritisch dargestellt' (Leipzig, 1883, 2nd ed., 1889, also translated by M'Cormack, London and Chicago, 1893). The philosophical faculty of the University of Göttingen has twice (in 1869 and in 1884) made the principles of dynamics the subject of a prize competition, presumably both times at the instigation of the late celebrated Professor Wilhelm Weber. The first competition led to the publication of E. Dühring's 'Kritische Geschichte der allgemeinen Principien der Mechanik' (Leipzig, 1872; republished, with much controversial matter, in 1876 and 1887); the second to the publication of Prof. Max Planck's 'Das Princip der Erhaltung der Energie' (Leipzig, 1887). In the same year as the last book there appeared 'Die Lehre von der Energie,' by Dr Georg Helm (Leipzig, 1887), and lately his very complete work, 'Die Energetik, nach ihrer geschichtlichen Entwickelung' (Leipzig, 1898).

[2] The controversy turned mainly on the question of the claims of Dr Julius Robert Mayer of Heilbronn. The experimental work of Joule in England and the theoretical work of Helmholtz in Germany were published in ignorance of the writings of Mayer. Even the earlier important papers of William Thomson (Lord Kelvin) and Rudolph Clausius appeared before the name of Mayer was generally known. The question then arose to what extent the publications of Mayer really anticipated the discoveries and theories of Joule, Helmholtz, Thomson, and Clausius. It can hardly be held that they influenced them. The whole of the evidence as to the former point is contained in a very complete publication by Prof. Jacob J. Weyrauch, "Kleinere Schriften und Briefe von Robert Mayer" (Stuttgart, 1892), which forms a supplement to the edition by the same author of Robert Mayer's 'Schriften,' entitled "Die Mechanik der Wärme" (Stuttgart, 3rd ed., 1893). Both books contain very careful and exhaustive notes. Whoever desires to settle the question of Mayer's claims, which, however, will always depend much on individual opinion, will find all the documentary evidence collected in these interesting volumes. A further controversy arose later as to the discovery and enunciation of the second law of thermodynamics, the great doctrine of the "Dissipation of Energy." This controversy arose over the publication of the late Prof. P. G. Tait's 'Sketch of Thermodynamics' in 1868, which is an amplification of two articles by the same author in the 'North British Review' of 1864. The controversy, which referred mainly to R. Clausius's share in the enunciation of the second law, can be studied in Tait's little volume (1st ed., 1868; 2nd ed., 1877), in vols. 43 and 44 of the 4th series of the 'Phil. Mag.,' in his 'Recent Advances in Physical Science' (especially the preface to the 3rd edition, 1885), and in the 2nd