Roland Eötvös'
PhD-files in Heidelberg: great novelties

by Henk Kubbinga (EPS-History of Physics Group) [1]

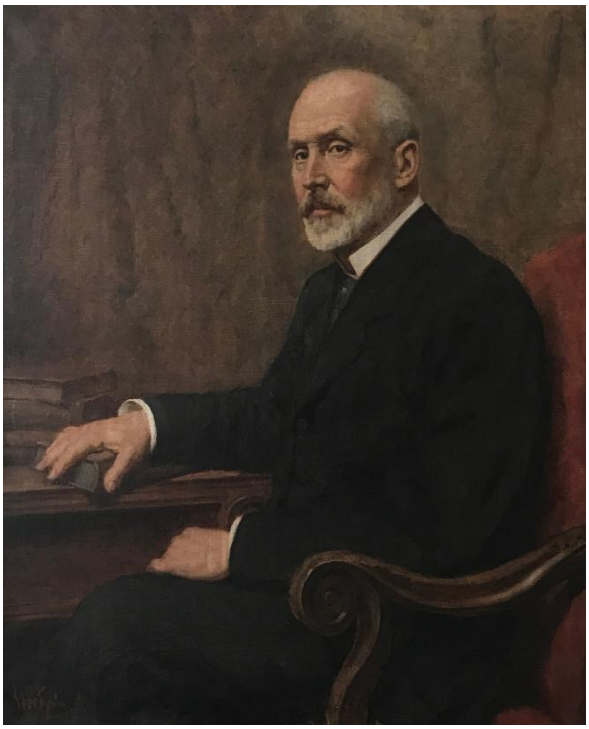

Fig.1 Roland Eötvös eternalized by Gyula Eder (oil on canvas; 89×73 cm, 1941, after a photograph made, in 1913, by Aladár Szekély).
Courtesy: Eötvös Loránd University, Budapest.

While preparing 'A Tribute to Roland Eötvös' for *Europhysics News* (2020)—on the spot, in Budapest—I had the privilege to work in the Library of the Hungarian Academy of Sciences and in the Roland Eötvös Museum, as kept by the Hungarian Mining and Geological Survey. Moreover I was allowed to attend the commemoration of the centenary of Eötvös' passing away, in a special session of the World Science Forum, on Wednesday, 20 November 2020, and, besides, the opening of the Eötvös-100 Exposition in the Library of the Eötvös Loránd University. It was a great pleasure to go through Eötvös' manuscript papers and his printed publications, and to study the construction and working of his instruments, most of all the epochal torsion balance, Eötvös' invention, which, on its own, put the new discipline of

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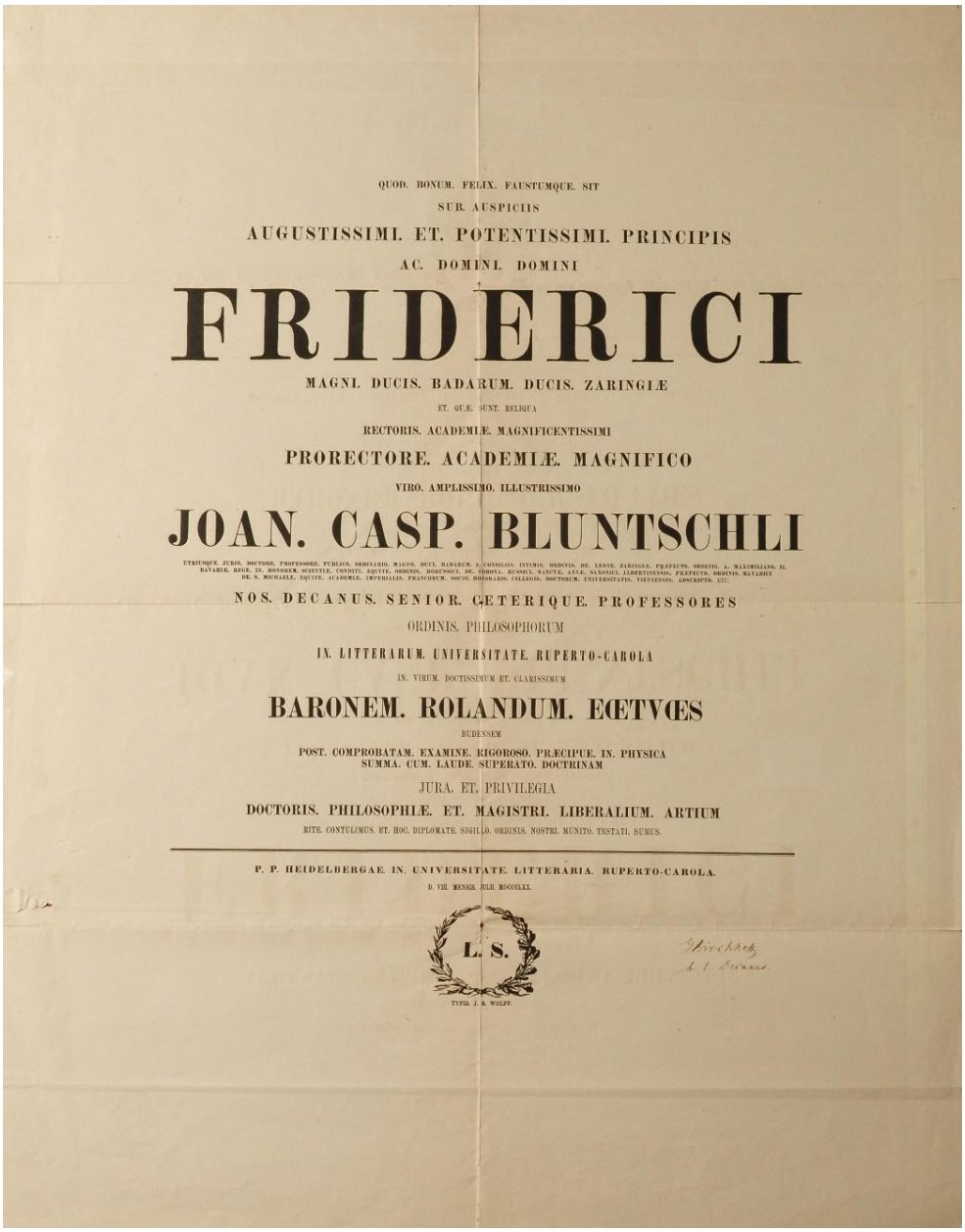

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Fig.2 Doctorate's *bulla* of Roland Eötvös, signed, on the lower right, by Gustav Kirchhoff, Dean of the Faculty of Philosophy (courtesy: Roland Eötvös Museum, Magyar Bányászati és Földtai Szolgálat, Budapest).

geophysics on the move. As a guest of the Hungarian Academy of Sciences I was also pleased to receive complimentary copies of the *Roland Eötvös Memorial Album*, as edited by Tamás Dobszay, János Estók, Gábor Gyány and András Patkós (Budapest: Kossuth Publishing, 2019) and the monograph *The Eötvös experiment in its historical context*, edited by Éva Kelényi (Budapest: Unicus Mühely, 2019).

Having studied all materials—with due attention for the biographical details—it struck me that Eötvös' student years in Heidelberg had remained rather vague [2]. The only surviving

[2] Gyula Radnai's impression in the *Roland Eötvös Memorial Album* (T. Dobszay, J. Estók, G. Gyáni and A. Patkós, Eds.), Budapest: Kossuth Publishing, 2019, p.18-20, seems to be based on Eötvös' correspondence from Heidelberg.

document, apart from Eötvös' correspondence, concerns the *bulla* which confirms that he passed the doctorate at Heidelberg, a document signed by no one less than Gustav Kirchhoff (1824-1887) [3], the then-dean of the Heidelberg Faculty of Philosophy and among the greatest names in European physics (Fig.2).

Passing the PhD nowadays presupposes the existence of a PhD-dissertation, so it was tempting to believe that possibly a dissertation composed by Eötvös might have survived, either in Budapest, or in Heidelberg. However, all my explorations in Budapest were in vain: there were only suggestions that his presumed dissertation materialized in a series of papers in Poggendorff's *Annalen der Physik* (1871, 1874, 1875) and addressed a problem formulated by Hippolyte Fizeau (1819-1896) about the relative motion of a light source with respect to an immobile ether [4]. However, these *Annalen [..]* papers proved to be ghosts, except for the 1874 paper. There were also suggestions that the PhD-topic had been the Doppler-effect, since Eötvös read several papers on Doppler's work, the first in late 1870 [5], that is: rather quick after his passing the PhD-exam in Heidelberg, while the 1874 paper in *Annalen der Physik* indeed addressed it, together with Fizeau's elaboration [6]. The latter paper, however, did not feature any clue hinting at an eventual dissertation. So the only way to go was to inquire in Heidelberg. Backed by the European Physical Society I sketched the problem in an email dated 25 November 2020 to Professor Bernhard Eitel, Rector of the Ruprecht-Karls-University, Heidelberg, kindly requesting to be allowed to study eventual souvenirs of Eötvös in the University's Archives. The answer, on behalf of the Archives of the Ruprecht-Karls-University, was unrestrictedly positive: there were indeed souvenirs of Eötvös' years in Heidelberg, that is, the period 1867-1870, all related to his PhD-project and, what is more, I was kindly invited to come over to study them. So I passed the week of 20 to 25 January 2020 in Heidelberg, most of the time in the Archives of the University, but also at University Library Heidelberg for background reading of the literature in Eötvös' time. The source materials in the Archives were the most revealing, though in a rather unexpected way. First, and still classic: I could confirm that Eötvös enrolled on 21 October 1867, at age 19, as may be deduced from the *Matrikelbuch* of that year. I subsequently turned to the promotion procedures anno 1870 in Heidelberg. These appeared to be rather different from our's. Indeed most of the PhD-ceremonies were public oral examinations in German, taking 2-3 hours, during a solemn extraordinary meeting of the complete staff of the Faculty of Philosophy. Crucially, a dissertation was *not* required. However, if indeed a candidate did submit a dissertation, the examination would be limited to the latter's contents and the PhD-*bulla* would expressly make mention of that dissertation. The surviving PhD-*bulla* of Eötvös (Fig.2) does *not* refer to a dissertation, so we may be pretty sure that there was none.

Each promotion-file in the Heidelberg Archives consists of two parts, the one consisting of formal papers from the candidate, the other of a more administrative nature. Eötvös' part of the file, then, consists of 1. A formal request by the candidate, addressed to the Faculty, to be granted the right to pass the PhD; 2. A curriculum vitae of the candidate—in

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[3] Part of the collection of the Roland Eötvös Museum, kept by the Mining and Geological Survey of Hungary, Budapest.

[4] See e.g. L. Marton, entry 'Eötvös, Roland, Baron von', in: C.C. Gillispie, Editor-in Chief, *Dictionary of scientific biography*, New York: Charles Scribner's sons, 1970-1980, volume IV (1971), p.377-381.

[5] L. Eötvös, 'Doppler elve és alkalmazása a hang- és fénytanban', 7 December 1870, in: *Természettudományi Közlöny [..]*, January 1871.

[6] L. Eötvös, 'Ueber die Intensität der wahrgenommenen Schwingungen bei Bewegung der Schwingungsquelle und des Beobachters', in: *Annalen der Physik 152* (8) 514-537 (1874)

Latin and in his own handwriting—with a detailed overview of all the classes he had followed; 3. Documents

Fig.3 Presentation of the rediscovered PhD files of Roland Eötvös on 23 January 2020 at the entrance of the Aula of the University of Heidelberg (UoH) under the direction of Professor Matthias Weidemüller (Pro-Rector, himself a physicist), in the middle. On the right: Dr. Ingo Runde, Director of the UoH-Archives. On the left, the present author. On the table: the volume with the *Acten der Philosophischen Facultät* (1869-1870), showing Eötvös' entry (left: the last page of Eötvös' autograph curriculum vitae; right: an unsigned copy of the *bulla*). Photography: Oliver Fink (UoH-Press Department).

confirming the candidate's proper moral behaviour delivered by his gymnasium and/or eventual other Universities. The first two documents are in Eötvös' handwriting, at once clear and stylish; the third, in German known as the 'Maturitätzeugniß', is lacking.

Having received this threefold set of papers, the Dean of the Faculty—in the present case Gustav Kirchhoff—then inquired by his colleagues whether or not the candidate was acceptable in their views and, if yes, what date would be the most suited for the ceremony: each colleague was expected to sign Kirchhoff's handwritten circular in his own handwriting. Since Eötvös had enrolled as a student of Physics, with Chemistry and Mathematics as accessory disciplines, the promotion would involve questions in these three branches, Physics getting priority. After the ceremony, the (three) Professors in charge—Gustav Kirchhoff (Physics), Robert Bunsen (Chemistry) and Leo Königsberger (Mathematics)—summarized their ideas on the quality of the answers. The supervising Professor, then, suggested what *judicium* might be allotted, a suggestion taken over by the Faculty as a whole. Together with a(n unsigned) copy of the *bulla* these handwritten notes—along with Eötvös' two texts—were bundled.

The Archives of the Ruprecht-Karls-University, then, features an uninterrupted set of annual volumes in which all the promotion bundles of the Faculty of Philosophy were collected in a chronological order, the so-called *Acten der philosophischen Facultät*. The volume containing the Eötvös archivalia—on page 300-304—covers the period 1 October 1869-1 October 1870 and has shelfnumber Univ. Archiv III, 5^{a}, № 99.

It appears from the foregoing that the most important novelty on Eötvös' student days in Heidelberg concerns his autograph curriculum vitae, featuring all details on the classes he attended. In his first semester, of 1867-1868, for instance, he followed courses dispensed by Bunsen, Helmholtz, Kirchhoff and Hesse. Bunsen taught Experimental Chemistry, in his own laboratory; Helmholtz read about Natural Science, Kirchhoff on Experimental Physics, while Otto Hesse gave an Introductory course on the Calculus and another course on Analytical Mechanics; Hesse also oversaw a seminar on Analytical Geometry. The second semester, then, the practical exercises in Chemistry, under Bunsen, continued, while Kirchhoff led a similar course of Physics and lectured on the Theory of Elasticity of Solid Bodies. Hesse continued with a course on Differential Calculations and another on Analytical Geometry of the Plane. Weber taught Fourier Analysis, while Leonhard introduced the students in Geology. The third semester was similarly scheduled: there was Helmholtz' course on Physiology of the Sense-Organs and another on Natural Science; two courses by Kirchhoff, the one on Theoretical Physics, the other on Electricity Theory; and Du Bois Reymond's courses on Analytical Geometry of Space—a series of lectures and a seminar—and Integral Calculus. The fourth and last semester was partly spent at the University of Königsberg, under Franz Neumann and Friedrich Richelot. Neumann taught Optics and Capita Selecta in Physics, while overseeing a Seminar; Richelot lectured on Analytical Mechanics and animated a Seminar. Back in Heidelberg Eötvös attended lectures by Helmholtz on Natural Science and on Force Conservation Laws, enrolled for Experimental Chemistry with Bunsen and for Theoretical Chemistry with Horstmann

High-resolution scans of all documents involved have been transferred to the Library of the Hungarian Academy of Sciences. For info, contact Deputy Director General of the Library and Information Centre of the Hungarian Academy of Sciences, András Holl (E: holl.andras @konyvtar.mta.hu).

The retrieval of the PhD file of Eötvös Loránd seems a most appropriate occasion to mobilize the citizenry of Hungary for a campaign to find further unknown documents related to him: correspondence, photographs, postcards, books-wit-a-dedication, and, why not, a copy of an eventual (auction ?) catalog of his private library. If you have any new item concerning Eötvös, please take the trouble to contact the Hungarian Academy of Sciences (E: info@ titkarsag.mta.hu), and the Library and Information Centre of the Hungarian Academy of Sciences (E: titkarsag@konyvtar.mta.hu).

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