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Pere Vieta (1779–1856), promoter of free public teaching of physics in Catalonia

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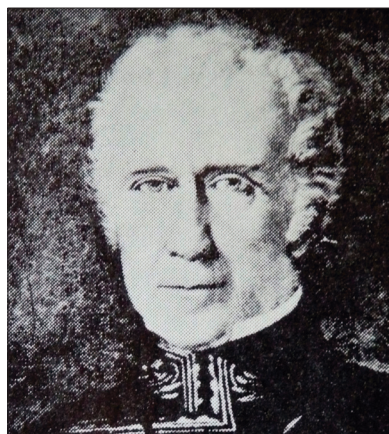


Fig. 1. Portrait of Pere Vieta i Gibert, 1779–1856. (From Palomeque, 1979).

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Summary. Free public teaching of physics in Catalonia started in the early 19th century, even if the interest in experimental physics goes back to the 18th century, where this discipline was discussed at various learned societies. The first chair of Physics in Barcelona was not a university chair but that of the Junta de Comerç de Barcelona (Trade Board of Barcelona), which had several scientific-technical Schools. In fact, at that time, Barcelona had no university, because it had been suppressed by King Felipe V after the War of the Spanish Succession (ended in 1714). The promoter of free public teaching of experimental physics was Pere (Pedro) Vieta i Gibert (1779–1856), who was the first professor of that subject both at the School of the Trade Board and at the University of Barcelona, once it was restored in 1842. Vieta, who was a surgeon in the Army, combined his two professions and his interest in meteorology, he having recorded meteorological observations in Barcelona for many years. Many of his students were influential people in the scientific, intellectual, political and economic history of the 19th century in Catalonia and Spain. [Contrib Sci 11:237-247 (2015)]

The interest in experimental physics in Barcelona goes back to the 18th century and, in particular, to the creation of the “Conferencia Físico-Matemática Experimental” (Experimental Physico-Mathematical Conference) in 1764, which became the “Real Academia de Ciencias Naturales y Artes” (Royal Academy of Natural Sciences and Arts) in 1770 [39]. At those times, there was no university in Barcelona, because it had been suppressed by a Royal Decree of King

Felipe V of May 11, 1717, and first public, free School dedicated explicitly to experimental physics was that of the Junta de Comerç de Barcelona (Trade Board of Barcelona), which was founded in 1814. Its promoter and first professor was Pere (Pedro) Vieta i Gibert (1779–1856) who, some years later, when the University of Barcelona was restored in 1842, became the first professor of physics at the Faculty of Philosophy (Fig. 1).

Keywords: Pere Vieta (1779–1856) · experimental physics’ teaching · Trade Board of Barcelona (mid 19th c.) · University of Barcelona (mid 19th c.) · Royal Academy of Natural Sciences and Arts (mid 19th c.)

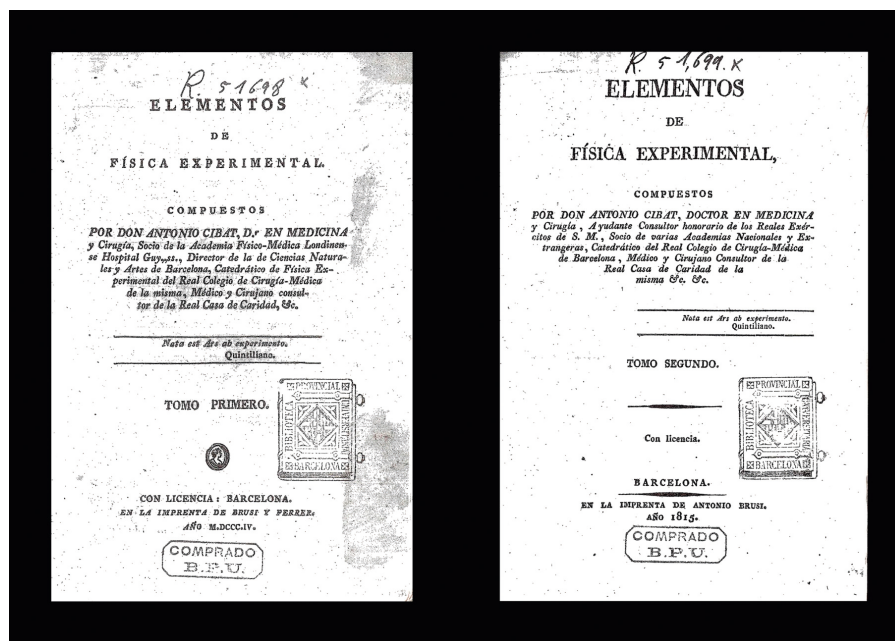


Fig. 2. The *Elementos de Física Experimental* (Elements of Experimental Physics) (Vol. 1, 1804, and Vol.2, 1815) by Antoni Cibat.

Origins and early education of Pere Vieta

Pere Vieta i Gibert (Pedro Vieta) (1779–1856) was born in 1779 in Sant Andreu de Llavanes, in the Catalan region of Maresme, near the city of Barcelona. He was a son of surgeon Antoni Vieta, and was a nephew of Didac Vieta (Diego Vieta), benefited presbyter of Santa María del Mar—the second most important church in Barcelona—and professor of theology and rector of the University of Barcelona [41].

We have little information about his childhood. In the funeral praise, made by his friend the lawyer Pau Valls i Bonet (1814–1888) in 1857, Valls simply asserted that his friend “had received a very careful early education”. And he assumed that, like others at that time, Vieta was introduced to knowledge with “Nebrija, Torrella and Goudin, with the advancements of Rosselli and Palmira archbishop” authors, all of them, with whom he undertook studies in medical sciences [42].

In fact, we know that Vieta was trained at the Real Colegio de Cirugía de Barcelona (Royal College of Surgery of Barcelona). This was the most important educational institution in the health sector in Catalonia at the time as well as a paradigm of the modernization of the Spanish surgery during the 18th century. There Vieta was influenced by professor Antoni San German i Tort (1755–1833), and Antoni Cibat i Arnautó (1771–1811), among other mentors.

Of the above mentioned Vieta mentors, Antoni Cibat i Arnautó, deserves special attention. Born in Cistella, in the Catalan region of Alt Empordà, Cibat, after having studied at the Royal College of Surgery of Barcelona from 1788 to 1792, went to Scotland to study physics, chemistry, medicine and surgery, earning a doctorate at the Marischal College, Aberdeen. His latinized name (*Antonius Cibatet Auranto*) appears in the list of diplomas awarded by that university from January 1792 to January 1793 [28]. In 1795, Cibat, being an honorary member of the Guy’s Hospital Medical Physical Academy in London, he became a member of the Royal Academy of Natural Sciences and Arts of Barcelona (Fig. 2).

In 1795, some decrees restructured surgery Colleges. New chairs were created, including that of experimental physics, which was included in the curriculum of the Royal College of Surgery of Barcelona. Vieta became acquainted with experimental physics by Cibat, who was appointed professor of experimental physics and began teaching this discipline. Cibat taught there from 1796 to 1806, when the chair was suppressed. Vieta must have excelled in experimental physics classes because in the absence of Cibat, he replaced him (Fig. 3).

The years of the Peninsular War

At the beginning of the 19th century, the army needed “practitioners” (i.e., surgeon assistants), especially during

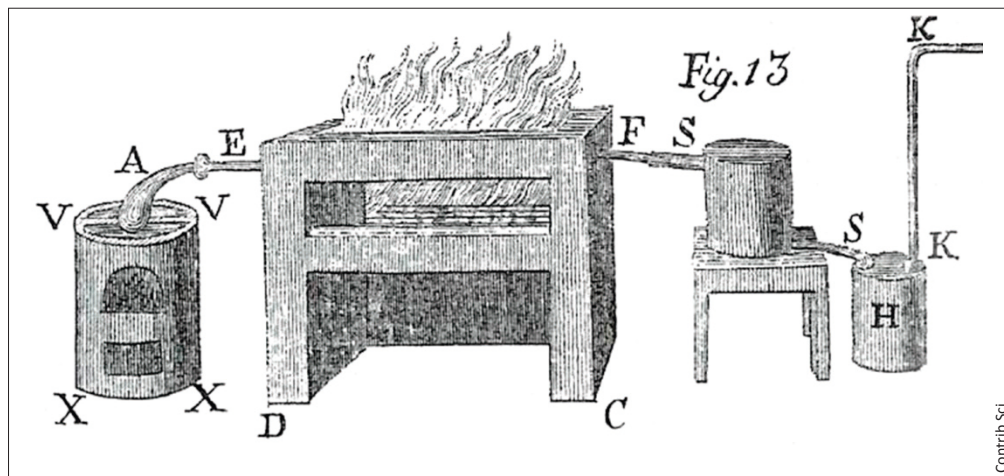


Fig. 3. Apparatus for the decomposition of water. Illustration from the book *Elementos de Física Experimental* (Elements of Experimental Physics) by Antoni Cibat (vol. 2, 1815).

wartime. The Royal College of Surgery usually sent student volunteers that returned to the College when the military campaign was over [22]. Vieta served as a practitioner in military hospitals of the army under the command of surgeon Antoni San German (1755–1833).

On 4 February 1803, Vieta was granted with the military status and was allowed to use the uniform of second assistant of the Army Medical Corps. On the 24th of October, 1804 he graduated in Medical Surgery and on November 11 that same year he was appointed Surgeon of the First Infantry Battalion of the Bourbon line. At the end of 1806, Vieta sat for an official examination to win the chair of experimental physics at the Real Seminario de Nobles (Royal Seminary for Noblemen) in Madrid, which had been vacant since the death of professor Juan Manuel Pérez that same year. Pérez had been the holder of that chair since José Moñino y Redondo (1728–1808), count of Floridablanca and Chief Minister of King Charles III, offered him the position in 1783. Vieta passed the examination and was the second in the shortlist of three candidates that was submitted to the King. However, on the 14th of February, 1807 another candidate, Liborio Pelleport, won the chair [23].

In 1808 the Peninsular War (1808–1814, “Guerra de la Independencia” in Spanish, “Guerra del Francès”, in Catalan) began, and on July 27 that year, Vieta was appointed first assistant of the army top brass. During the war he was sent to Mequinenza, in Aragon, by the General Captain of the Principality of Catalonia, Theodor von Reding (1755–1809). There he served as Surgery Consultant. He was present at the siege of Tarragona (1811) [4] in which, apparently, he was taken prisoner. Later, in 1813, he was assigned to the Hospital of Vic [42].

After the war, the Trade Board of Barcelona (Junta de Comerç de Barcelona) reopened its scientific-technical Schools (Navigation, Fine Arts, Business, Shorthand, Chemistry applied to Arts, and Mechanics), which had been closed during the war [1]. In particular, in 1814 the School of Mechanics of Francesc Santponç i Roca (1756–1821), introducer of the double-effect steam engine in Barcelona, reopened and Vieta enrolled. That same year, Vieta, who was first assistant surgeon at the Royal Army, requested the Trade Board to establish new experimental physics studies and suggested that they should appoint himself professor. He defended the necessity and importance of experimental physics and assured that, in his classes, experiments would be abundant because he was convinced that only experience could prove the truth or the falsity of facts stated [43].

The Trade Board agreed to establish the new free School of Experimental Physics and appointed Vieta professor “for during the will of the Trade Board”. The opening of the College had been announced for the 29th of October, 1814, but it opened a day before on October 28 in the building of the Lotja (building where commercial transactions were made) of Barcelona [12], where Vieta read the inaugural speech [43]. Classes were scheduled from 11 am to 12 am, to assure there would be light enough for optical experiments (Fig. 4).

In May 1815, Vieta applied to join the Royal Academy of Natural Sciences and Arts of Barcelona, where he presented an entry report on *aurora borealis* (northern lights) [44]. That report was related to questions that someone who signed DFS (DFS might have stood for “Don Francisco Sanpons”) had addressed him through the *Diario de Barcelona* newspaper. There were questions about luminous meteors observations

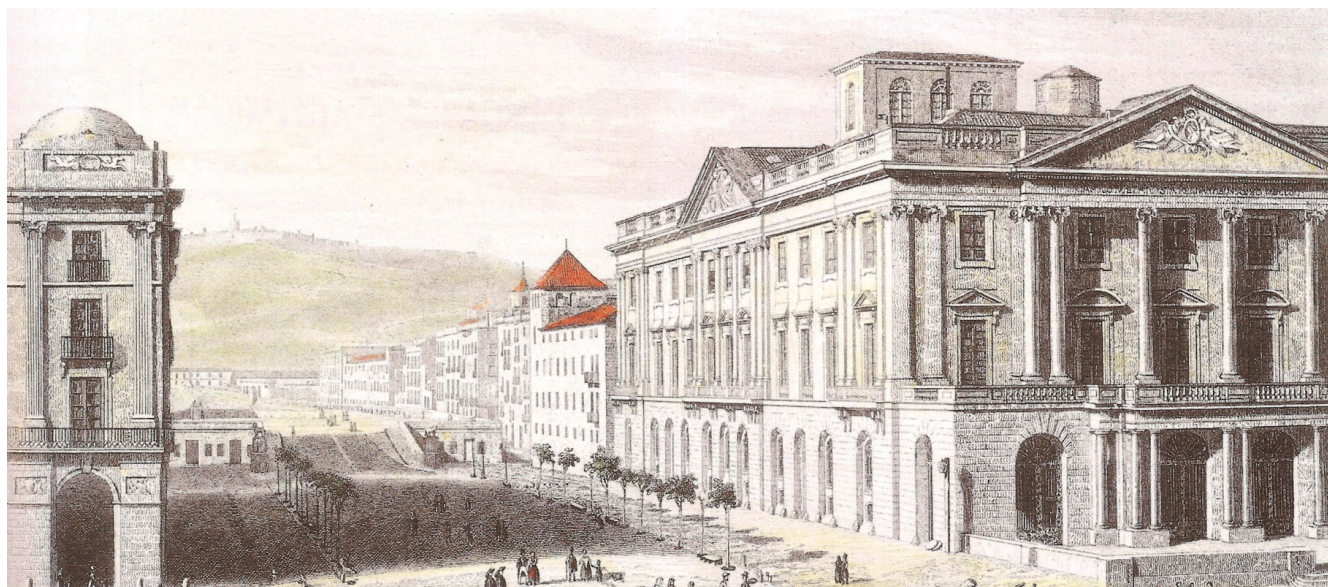


Fig. 4. The *Llotja* building, the Board's headquarters. (Antoni Roca Sallent engraving, 1842).

made in Barcelona over several days in November 1814 [2]. Vieta was admitted in the Optics Section of the Academy on June 14, after a favorable report from Joan Francesc Bahí (1775–1841), who acted as censor. A month later, on July 15, when he took office as a member of the Academy, he was elected director of the Optics Section.

Army and professorship, a difficult marriage

The obligations of the military status of Vieta repeatedly interfered with his teaching activities. This already happened during the first academic year; as a surgeon of the first battalion of the Royal Regiment of Sapper-Miners, allocated in Alcalá de Henares, Madrid, he applied for a leave of absence to remain in Barcelona. After other similar situations, and before the alternative of giving up his position in the army or leaving the chair of physics, the Trade Board finally granted him the chair “in perpetuity” on 17 June 1816, provided he asked the King (Ferdinand the Seventh), through the Minister of War, a permit to leave active duty [30]. On August 9 that same year, he became a member of the “Real Academia de Buenas Letras de Barcelona” (Royal Academy of Letters), where he had read some *Consideraciones históricas físicas* (Physical Historical Considerations) (April 20, 1816) and where he also read a *Memoria sobre la sequía de los veinte y cuatro años* (Report on the twenty-and-four-year draught) [14]. In

that report he proved, by means of physical and geological arguments, the impossibility of a supposed twenty-four-year drought in Spain, which many historians defended [13].

For his lectures, in addition to using the *Elementos de geometría* (Elements of Geometry) by Father Roger Martin (translated from the *Institutions mathématiques* by Francesc Santponç i Roca, 1756–1821), Vieta used the *Elementos de Física Experimental* (Elements of Experimental Physics) by Antoni Cibat as a textbook [8,9].

The use of Cibat's book is corroborated by some handwritten notes, dated from 1814, found by the author of this biography [32]. Cibat's work was aimed to surgeons, but rather, Vieta translated into Spanish the *Traité complet et élémentaire de physique* (Complete and Elementary Treatise of Physics) in three volumes, of the French physicist Antoine Libes (1752–1832), teacher at *lycées* of Paris and, later, lecturer at the *École Centrale*. This work was formally structured in topics close to physics as we understand it today, a discipline that was consolidated in the first decades of the 19th century (Fig. 5).

Vieta paid out of his pocket 18,000 *reales* for the printing of the translated book. In 1818 the first edition of this translation appeared under the title: *Tratado de física completo y elemental* [21]. In addition to translating it, Vieta expanded it. In the years 1821, 1827–28 and 1838 other editions of the book were released [40]; in the study plan of 1824 this book was the selected textbook in Spain by royal provision.

At the Royal Academy of Natural Sciences and Arts, Vieta presented a *Memoria sobre la doble refracción* (Report on double refraction) on 20 May 1818, and on July he was elected director of the section of Optics and Cosmography. Since then, he was reelected in this position every year until the forced closure of the Academy in 1824 during the *Década Ominosa* (Ominous Decade, 1823–1833, the last ten years of the reign of King Ferdinand VII, a period of absolutism in the government of Spain) [36].

In 1819, Vieta earned his degree in Medicine [15]. At that time, the Trade Board of Barcelona published the first technical journal in Catalonia, *Memorias de Agricultura y Artes* (Reports on Agriculture and Arts), published between 1815 and 1821 [33]. The authors were lecturers from the schools of Botany, Chemistry and Mechanics of the Trade Board of Barcelona. It was in that journal that Vieta refuted the objections about the weight of the air that the French surgeon Hyacinthe Bodélio had published five months earlier [45].

During the Liberal Triennium (1820–1823, a three-year period of liberal government in Spain), Vieta was appointed corresponding member by the *Academia General de Ciencias, Bellas Letras y Nobles Artes* (General Academy of Sciences, Beautiful Letters and Noble Arts) of Cordoba on March 13, 1821 [25,42]. The summer that year, when there was an epidemic outbreak of yellow fever in Barcelona, Vieta remained in the city and assisted the Trade Board's employees and their families [6]. In 1822 he participated in the first and ephemeral attempt to restore the University of Barcelona—closed by the Bourbon King Felipe V after the War of the Spanish Succession—and the Government appointed him professor of Physics on 22 November [34,16]. At that time, on June 9, 1822, he was also appointed member of the *Imperiale e Reale Accademia Economico-Agraria dei Georgofili di Firenze* (Imperial and Royal Academy of Agricultural Economics of the Agriculturalists of Florence).

After Francesc Santponç death, in 1821, the School of Mechanics of the Trade Board of Barcelona was closed. In 1824, Vieta suggested to the Trade Board to compensate for the absence of the chair of Mechanics by broadening the lessons of the rudiments of statics and hydrostatics and increasing the number of experiments related to these disciplines. Moreover, from 1827 to 1843 Vieta continued his meteorological observations in Barcelona. Francesc Salvà i Campillo (1751–1828), a physician from Barcelona also known for his contributions to meteorology and telegraphy, had started collecting meteorological data from his home and would published them in the *Diario de Barcelona* newspaper

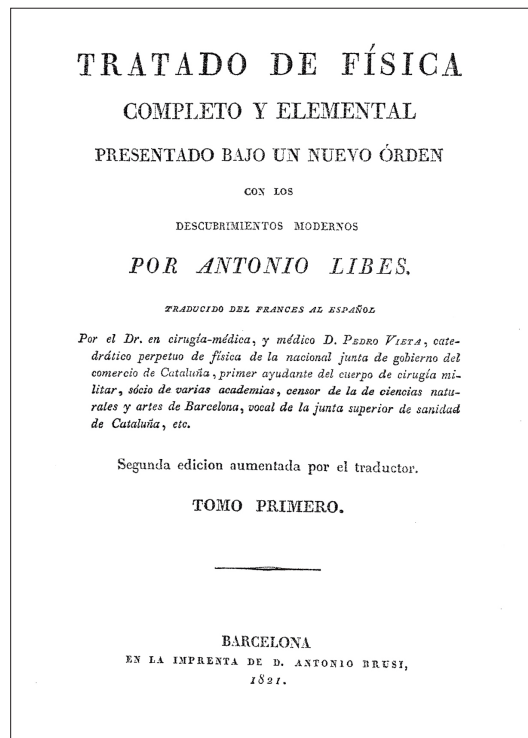


Fig. 5. The Spanish *Traité complet et élémentaire de physique* (Complete and Elementary Treatise of Physics) of Antoine Libes, translated by Pere Vieta.

from 1780 to 1824 [18]. Vieta moved the observation point to the headquarters of that newspaper [3].

At the School of Experimental Physics, Vieta could have a cabinet with a considerable amount of instruments thanks to the monthly financial contributions of the Trade Board of Barcelona. In 1830, Vieta himself requested to the Trade Board various tools that were located at the Trade Board's headquarters, the Llotja building, to promote a factory of scientific equipment: "a factory to produce physics, mechanics, mathematics equipment" because this was, in his opinion, "the kind of manufacture not found in Spain" [32].

On April 6, 1831 he was promoted to Deputy Director of the Army Surgeons Corps of the Catalonia District. A few months later, in January 1832, he had to travel to the castle of San Fernando, in Figueres (Girona province), to try to alleviate the intermittent fevers affecting the garrison of that fortress. He wrote a report *Sobre las fiebres intermitentes* (On intermittent fevers), preserved in the Academy of Medicine of Barcelona [14]. According to Joan Corminas (1800–1854), contemporary to Vieta, Vieta wrote "in a medical journal of Barcelona" a report on the *tercianes* (intermittent fevers) prevalent in the castles of Figueres and Hostalric" following the instructions he received from the Government [11].

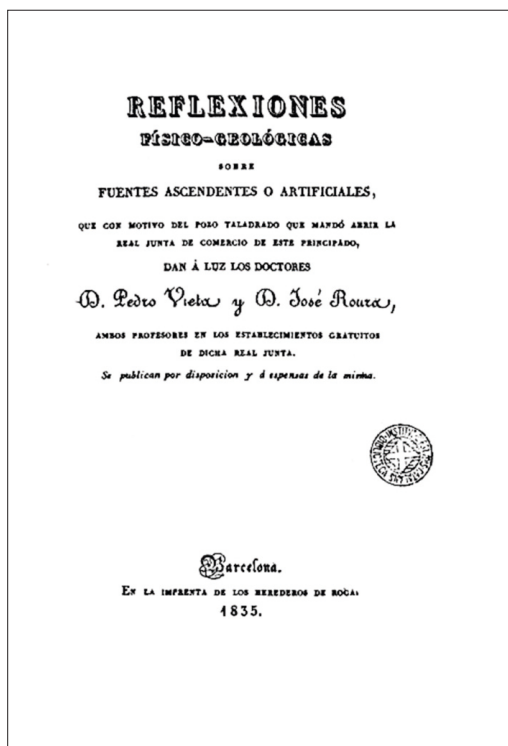


Fig. 6. The pamphlet *Reflexiones físico-geológicas sobre fuentes ascendentes ó artificiales* (Physical-geological reflections on ascending or artificial water sources) published by Pere Vieta and Josep Roura in 1835

The Trade Board of Barcelona found it contradictory to the agreement they had reached with Vieta in 1816 that his new position forced him to be absent from the city. The Trade Board, however, given the merits Vieta had acquired after eighteen years as professor of Physics, accepted that during Vieta's absences there was a substitute lecturer in class, provided he notified his absences beforehand. The substitute lecturer, proposed by Vieta himself, was his disciple Joaquim Balcells i Pasqual (1807–1879) [6].

Vieta was a member of the Royal Academy of Medicine of Barcelona, where he pronounced his induction speech on June 17, 1833 [7]. When, in 1834, there was an epidemic of cholera in Barcelona, Vieta took the lead of the Cholera's Hospital in the city. At the Royal Academy of Medicine and Surgery, he was a member of several committees. In 1835, he participated in the commission of *Topografía* (Topography) along with Joan Lopez, Fèlix Janer and Joan Isidor de Bahí, and also as a member of the commission of *Aguas y Baños minerales* (Mineral baths and waters) with the two latter and with Joan Ribot and Francesc Carbonell i Bravo [19]. He made outstanding contributions to produce a medical topography of Catalonia [7].

At those times Vieta collaborated with Josep Roura i Estrada (1797–1860), who, like himself, was a member of the Royal Academy of Natural Sciences and Arts of Barcelona and was a lecturer at the School of Chemistry applied to the Arts of the Trade Board of Barcelona. Both published a pamphlet in 1835: *Reflexiones físico-geológicas sobre fuentes ascendentes ó artificiales, con motivo del pozo taladrado que mandó abrir la Real Junta de Comercio de este principado* (Physical-geological reflections on ascending or artificial water sources, on the occasion of the drilled well bored following the commission of the Royal Trade Board of Barcelona of this Principality) [46]. In this work, they analyzed the interest of finding and using groundwater. That work was based on a detailed analysis of the drilling a borehole in Les Corts de Sarrià—by then a village adjacent to Barcelona, nowadays one of its neighborhoods—in 1834. The drilling works had been conducted by Hilarión Bordeje i Piña (1792–1869), professor of the School of Machinery of the Trade Board of Barcelona. Vieta and Roura proposed a practical method to make the artesian wells profitable and advantageous (Fig. 6). Vieta's interest in issues related to geology and upwelling groundwater was also reflected in the offer he made to the Royal Academy of Natural Sciences and Arts (October 21, 1835) of several samples of sand from the mouths opened following the March 21 earthquake in Torreveija, near the city of Alicante, and a bottle of water thrown by one of those mouth, which he accompanied with the analysis made by the academician Agustí Yáñez i Girona (1789–1857) [36].

During the First Carlist War (1833–1840) Vieta was mobilized and took a leading role as a surgeon. Towards the end of the war, in 1839, that the experience he had gained allowed him to write drug formulary for military hospitals [15]. Since 1835, his relationship with the Trade Board deteriorated due to his absences from the classes. He often was late for the classes, and in October 1835 was absent without no leave. Vieta and the Trade Board recriminated to each other. Given its experience, on 21 November 1835 he was appointed Major-Doctor Surgeon of the Army of the North [36], and in early 1836 he joined that Army. Given the situation of Civil War, the Trade Board agreed about Vieta's leave, and he was temporarily replaced by Joan Agell i Torrents (1809–1868). However, Vieta was warned that he should return to work after the end of the academic year, otherwise, his chair would be declared vacant. Vieta appealed to the Ministry against the decision of the Trade Board. Through a Royal Order of 20 July 1837, Queen Isabel II (1830–1904) agreed to Vieta's request of retaining the ownership of the chair of Physics of the Trade Board of Barcelona throughout

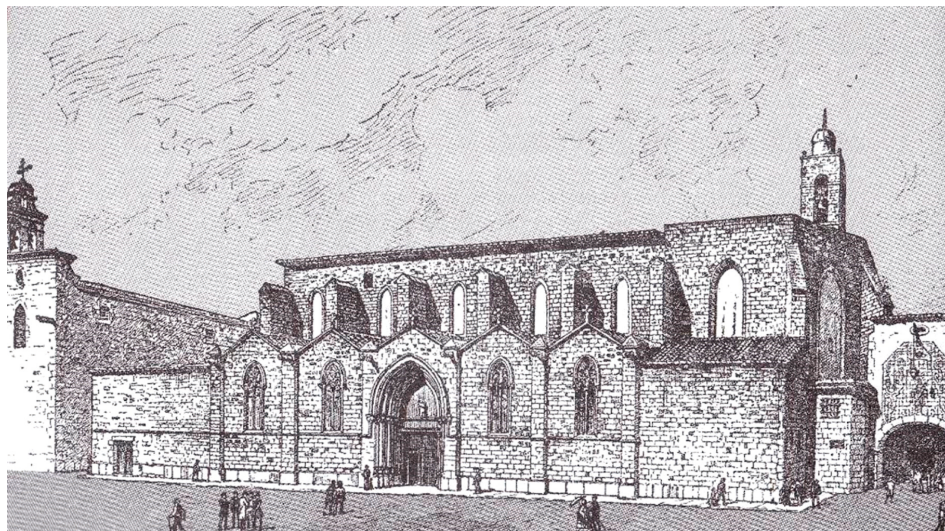


Fig. 7. The ancient Convent of Carmen, where the University of Barcelona was provisionally set up in 1838.

the time he would be in the Army. At that time Vieta was Deputy Inspector of the Army Surgeon Corps at the Army operating in the North [26].

The University of Barcelona and the Trade Board of Barcelona Schools

In the early 19th century there was no University in Barcelona since it had been suppressed after the War of the Spanish Succession by Royal Decree signed by Felipe V on May 11, 1717 [38]. The city was living decisive moments in the attempt to recover its University. The academic year 1836–1837 the *Estudis Generals* (*Studia Generalia*) were restored. In 1837 the process of provisionally restoring the University of Barcelona started; a process that would culminate in 1842. The Trade Board suppressed the chair of Experimental Physics, which was included in the studies of the University, and decided to create another chair of *Física Experimental aplicada a la indústria* (Experimental Physics applied to industry) that finally would be of *Física aplicada a les Arts* (Physics applied to Arts). After a series of appeals, proposals and counterproposals, Vieta finally had to choose one of both chairs because he could not receive two salaries. In June 1838 opted for the University chair of Physics (who ran temporarily) and left the Trade Board (Fig. 7).

Educational changes and the confrontations with Vieta paralyzed the teaching of Physics of the Trade Board from 1837–1838 to 1839–1840 academic years. The School of Experimental Physics ended so a period (1814–1837) during

which the School had been the busiest of all scientific, technical educational centers of the Trade Board of Barcelona [31].

In October 1840, the Governmental Trade Board of the province separated from their chairs the rector and several professors of the University of Barcelona, including Vieta, presumably due to their hostility to the progressist ideology [26].

Finally, when the First Carlist War was over, in the academic year 1840–1841, the School of Physics applied to Arts of the Trade Board of Barcelona opened. Vieta presented a program to the Trade Board and the Ministry resolved that he would be the lecturer until he obtained the chair at the University. At the beginning of November 1840, the first volume of the third edition of *Éléments de physique expérimentale et météorologie* (Elements of Experimental Physics and Meteorology), which Vieta had translated into Spanish was already in press. The author, Claude Pouillet (1790–1868), was professor of Physics applied to Arts at the Conservatoire des Arts et Métiers of Paris and professor of Physics, after Louis Joseph Gay-Lussac (1778–1850) and Pierre Louis Dulong (1785–1838), at the Faculty of Sciences of that city. Vieta dedicated this translation to the Trade Board. In August 1841, he had already translated the second volume, and published Pouillet's work with the title of *Elementos de Física Esperimental [sic] y de Meteorología* [29]. He added a report on the daguerrotype [42]. This textbook was his reference text for classes from the academic year 1840–1841 until his resignation in 1844 (Fig. 8).

Vieta grew an interest in fires and how to extinguish them. In the public examination of Experimental Physics held on July 3 and 4, 1835, his inaugural lecture dealt with

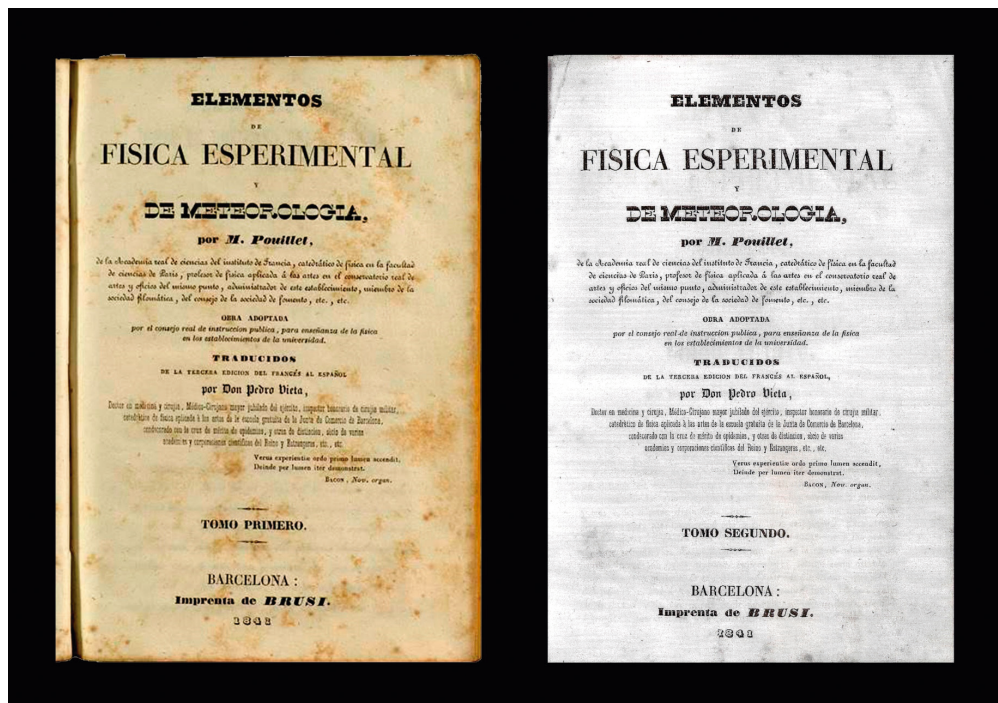


Fig. 8. The book *Elementos de Física Experimental y de Meteorología* by Claude Pouillet, which Vieta translated into Spanish (Vol. 1 and Vol. 2, 1841).

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this issue. On October 25, 1840, he discussed it again when he read a report at the Royal Academy of Natural Sciences and Arts entitled: *Reflexiones [sic] físico-químicas sobre incendios* (Physicochemical reflexions on fires). He showed, with scientific arguments, that the hypothesis defended by various authors that stated that the water in steam state intensified ignition was false. He also warned about the danger of making openings in the rooms to leave the smoke go out, because this would favor combustion [47]. He also dealt with the solar eclipse in 1842. Thus, on March 16, 1843, as a director of the Physical-Chemical Section of the Royal Academy of Natural Sciences and Arts, he presented a *Memoria sobre el eclipse de Sol acaecido en 8 de julio del año próximo pasado* (Report on the solar eclipse having taken place on July 8 last year).

He combined his dedication to the Royal Academy of Natural Sciences and Arts and his lectures at the School of Physics of the Trade Board with activities related to medicine. On May 9, 1841, at the initiative of the Saint-Simonian physician Pere Mata i Fontanet (1811–1877) the *Sociedad Médica de Emulación* (Medical Society of Emulation) of Barcelona was founded, with the aim of dealing with all branches of knowledge about the art of healing, under the motto “mutual instruction, fraternity, scientific progress” [37], and Vieta was one of its members [20]. On January 3, 1842,

he imparted the inaugural lecture of that society at the Royal Academy of Medicine *Apuntes acerca de la catarata* (Notes on the cataract). He described the disease, the symptoms and the methods to operate on a cataract, indicating the changes that he had introduced [48]. Between 1842 and 1843 he became interested in phrenology, that Marià Cubí i Soler (1801–1875) had disseminated, first with some prevention and later with a better disposition, clearly describing the objectives of that new discipline—now regarded as obsolete—through contributions to the *Diario de Barcelona* newspaper, where he signed as M.M. [24]. Since 1843 and for the three consecutive biennia (1843–1848) Vieta was presided of the Royal Academy of Medicine, though officially he was Vice-President because the presidency *de iure* was in Madrid [15]. In 1844 he read a *Memoria médico-manicómica ó sean observaciones médicas sobre los dementes* (Report on medical-insane asylum issues i.e., medical observations on the insane) [14].

In early 1844, Vieta was a member of the Barcelona City Council, provisionally chaired by the Major Josep Bertran i Ros (1795–1855). In March that same year, a Royal Order returned to Vieta the chair of Physics of the University [26]. However, until August 31 he only held the chair of the Trade Board of Barcelona because he could not hold two chairs at the same time. In September 1844, Vieta notified the

Trade Board that he was forced to resign his professorship in Physics applied to the Arts because it had recovered his chair at the University.

During the Moderate Decade (May 1844–July 1854), with the power in hands of the Moderate Party, education was restructured in Spain. Pedro José Pidal (1799–1865), Governance Minister, enacted the so-called Plan Pidal (Pidal's Plan) (September 17, 1845), which centralized and uniformized education. On October 7, 1845, Vieta was appointed Dean of the School of Philosophy at the University of Barcelona, and on June 2, 1846, he obtained a doctoral degree in Sciences.

In the mid 1840's Barcelona was experiencing a remarkable industrial development, which generated a great concern about the influence of steam engines and chemical industries on public health. In early 1845, Vieta was a member of a commission of the Royal Academy of Natural Sciences and Arts that had to assess and report about this issue to the City Council [5]. His reputation as both physician and physicist was widely recognized. He was the President of the Royal Academy of Natural Sciences and Arts (1846–1847) and on August 31, 1847 he was appointed director of the Physicochemical Sciences Section for the academic year 1848. By then he was a member of the *Sociedad Económica Barcelonesa de Amigos del País* (Barcelonian Economic Society of Friends of the Country), of which he became the director on 1849. The following year, on April 11, he was elected member of the Provincial Academy of Sciences and Letters of the Balearic Islands [42].

At the University of Barcelona, Vieta taught *Física y nociones de química* (Physics and Chemistry concepts) and *Ampliación de Física* (Advanced Physics). The programs of both subjects, which he prepared and published for the 1847–1848 academic year have been preserved [49,50]. Due to the death of the rector of the University of Barcelona, Joaquim Rey i Esteve (1775–1850), in January 1850, Vieta, who was Dean of the School of Philosophy, was appointed Rector-in-Office until March 7, when a new rector, Mariano Antonio Collado (1796–1853), was appointed. In late August that year, 1850, a new university curriculum was approved. A Royal Order (September 10, 1850) regulated that no student would be accepted that had not studied advanced algebra and analytic geometry. A few weeks later, another Royal Order (September 26, 1850) established that the textbooks for Advanced Physics would be: *Tratado de Física Experimental y meteorología* (Treaty of Experimental Physics and Meteorology) by Claude Pouillet, translated by Vieta, *Curso completo de Física Experimental* (Complete Course



Fig. 9. The painting with the idealized portrait of the lithotomist *Frère Côme* (1703–1781) that Vieta gave to the Royal Academy of Medicine (from Corbella, 2010).

of Experimental Physics) by Fernando Santos Castro (1809–1890) and the *Tratado elemental de Física* (Elementary Treatise of Physics) by Cesar Despretz (1791–1863), translated into Spanish [27].


Facing the end

About the last years of Vieta's life, we know that in 1851 he gave to the Royal Academy of Medicine a painting with the portrait of the lithotomist Jean Baseilhac (1703–1781), known as *Frère Côme*, which is kept in the Turró's room of that institution [10]. The following years, Vieta received the recognition of institutions that had accepted him as a member, such as the *Instituto Agrícola Catalán de San Isidro* (Catalan Agricultural Institute of San Isidro) (December 10, 1852), the *Asociación de Socorro y Protección de la clase obrera* (Association for the Relief and Protection of the Working Class) (December 14, 1853) or the philanthropic *Instituto de África* (Institute of Africa) to abolish slavery (March 20, 1854) [42]. On April 27, 1854, Vieta requested retirement from work and he was granted it. Two and half years later, he died (Fig. 9).

According to the announcement that his son-in-law,

Narcís Gay (1819–1872), sent to the Royal Academy of Natural Sciences and Arts, Vieta died on October 7, 1856 at 3:30 am. The following day (October 8, 1856) at 11 am the funeral was held in the Church of Santa Maria del Pi and his remains were buried in the cemetery of the Parish Church of Sants [17].

Through Experimental Physics classes, Vieta influenced many students. Some youngsters of the first years including Joaquim Llaró i Vidal (1796–1824), Bonaventura Carles Aribau i Farriols (1798–1862) and Ignasi Santponç i Barba (1795–1846), who adored his mentor, were among the founders of the Philosophical Society (1815–1821). The members of that society were later involved in the birth of Catalan romanticism [35].

Moreover, a considerable number of Vieta students played major roles in various fields of the scientific, cultural life of Catalonia and Spain in the mid 19th century. Several of them were devoted to physics or chemistry, while others were lawyers, economists, botanists, physicians, businessmen, philosophers, mathematicians or entomologists. Many were influential members, and with responsibilities, in scientific or literary academies, or professors at different universities around Spain. For example, among Vieta's disciples we can find Laureà Figuerola (1816–1903), who became Minister for Finance and promoter of the creation of the “peseta” (the currency used in Spain before the euro was adopted); Marià de la Pau Graells (1809–1898), who became senator of the kingdom, and Joan Agell i Torrents (1809–1868), who was a rector of the University of Barcelona. The reason for all this was that, at the time of Vieta, experimental physics became a symbol of modernity and was considered a basic ingredient for education [32]. 

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References

- Barca FX, Bernat P, Pont M, Puig-Pla C (coords.) (2009) *Fàbrica, taller, laboratori. La Junta de Comerç de Barcelona: ciència i tècnica per a la indústria i el comerç (1769–1851)*. Cambra Oficial de Comerç, Indústria i Navegació de Barcelona, Barcelona
- Barca FX (2014) Una llum vermella apareguda a la posta de Sol. In: Bernat P (ed.) (2014) *Astres i Meteors*. Edicions Talaiots. Palmanova (Calvià, Mallorca), pp. 49-71
- Barriendos M, Peña JC, Martín Vide J (1998) La calibración instrumental de registros climáticos documentales. Aproximación metodológica a resolución anual para el caso de la precipitación en Barcelona (1521–1989). *Investigaciones Geográficas*, 20: 99-117 doi:10.14198/INGEO1998.20.01
- Blanch A (1861) *Cataluña. Historia de la Guerra de la Independencia en el antiguo Principado*. Imprenta y librería politécnica de Tomás Gorchs, Barcelona, vol. 2
- Bouza, J (1992) Una visión progressista del desarrollo urbano: el informe sobre vapores de la Academia de Ciencias de Barcelona. In: Capel, H, López Piñero JM, Pardo, J (eds.) (1992) *Ciencia e ideología en la ciudad*. Generalitat Valenciana, Conselleria d'Obres Públiques, Urbanisme i Transports, Valencia, vol II, pp 139-150
- Carrera Pujal J (1957) *La enseñanza profesional en Barcelona en los siglos XVIII y XIX*. Bosch, Barcelona
- Calbet JM, Corbella J (1983) *Diccionari biogràfic de metges catalans*, Fundació Salvador Vives Casajuana / Seminari Pere Mata. Universitat de Barcelona, Barcelona, vol 3
- Cibat A (1804) *Elementos de física experimental*. Imprenta de Brusi y Ferrer, Barcelona, vol. 1
- Cibat A (1815) *Elementos de física experimental*. Antonio Brusi, Barcelona, vol. 2
- Corbella J (2010) L'obra de Jean Baseilhac, més conegut com Fra Cosme (1703–1781). *Rev R Acad Med Catalunya* 25:73-76
- Corminas J (1849) *Suplemento à las Memorias para ayudar a formar un diccionario crítico de los escritores catalanes...que en 1836...publicó Félix Torres Amat*. Imprenta de Arnaiz, Burgos
- Diario de Barcelona (1814, 27th September)
- Diccionario Geográfico Universal dedicado a la Reina Nuestra Señora (1831). Imprenta de José Torner, Barcelona, p. 710
- Elías de Molins A (1889) *Diccionario biográfico y bibliográfico de escritores y artistas catalanes del siglo XIX*. Imprenta de Fidel Giró, Barcelona, vol.II, 753-754
- Escudé M (2008) Pere Vieta i Gibert, president de la Reial Acadèmia de Medicina de Barcelona (1843–1848). *Rev R Acad Med Catalunya* 23:28
- El Pensamiento de la Nación (1846, 3rd June)
- Expedient de Pere Vieta (Pere Vieta dossier). RACAB Archive.
- Fontseré E (1930) Pròleg. In: Febrer, J (1930) *Atlas pluviomètric de Catalunya*: 9-16. Institució Patxot, Barcelona
- Gaceta de Madrid (1835, 25th April & 22nd June)
- Gil Pérez JI (2001) *La obra de Cayetano Garviso (1807–post.1871)*. Cirujano vasco-navarro liberal de América. Publicacions del Seminari Pere Mata de la Universitat de Barcelona, Barcelona
- Libes A (1818) *Tratado de física completo y elemental presentado bajo un nuevo orden con los descubrimientos modernos*. Impr. de Antonio Brusi, Barcelona [Translator: Pedro Vieta]
- Massons JM (1993) *Francesc Puig (1720–1797) i els cirurgians del seu temps*. PPU, Barcelona
- Moreno A (1988) *Una ciencia en cuarentena. La física académica en España*. CSIC, Madrid
- Nofre D (2004) *En els marges de la ciència? Frenologia i mesmerisme en una cultura industrial, Barcelona 1842–1845*. Universitat Autònoma de Barcelona, Barcelona (Ph.D. thesis). Available at: http://ddd.uab.cat/pub/trerecpro/2004/hdl_2072_5116/TR_David_Nofre_Mateo.pdf
- Notícia de la Academia de Ciencias, Bellas Letras y Nobles Artes, de esta Ciudad de Córdoba (1847). Imprenta de D. Juan Manté, Córdoba
- Palomeque A (1974) *Los estudios universitarios en Cataluña bajo la reacción absolutista y el triunfo liberal hasta la reforma de Pidal (1824–1845)*. Publicaciones de la cátedra de Historia universal. Departamento de Historia contemporánea. Universidad de Barcelona, Barcelona
- Palomeque A (1979) *La Universidad de Barcelona desde el Plan Pidal de 1845 a la Ley Moyano de 1857*. Ediciones de la Universidad de Barcelona, Barcelona
- Pérez N (2007) *Anatomía, química i física experimental al Reial Col·legi de Cirurgia de Barcelona (1760–1808)*. Universitat Autònoma de Barcelona, Barcelona (Ph.D. thesis) Available at: <http://ddd.uab.cat/pub/tesis/2007/tdx-1203107-162239/npp1de1.pdf>

29. Pouillet C (1841) Elementos de Física Experimental y de Meteorología, Imprenta de Brusí, Barcelona, 2 vol [Translator: Pedro Vieta]
30. Puig-Pla C (2000) De la física experimental a la física industrial. Anàlisi d'una càtedra barcelonina (1814–1851). Quaderns d'Història de l'Enginyeria IV:119-172
31. Puig-Pla C (2001) La escuela de física experimental de Barcelona: primera época (1814–1836). In: Álvarez Lires M et al. (eds.) Estudios de Historia das Ciencias e das Técnicas, vol.2:1015-1026. Diputación Provincial, Pontevedra
32. Puig Pla C (2006) Física Tècnica i Il·lustració a Catalunya. La cultura de la utilitat: assimilar, divulgar, aprofitar. Universitat Autònoma de Barcelona, Departament de Física, Barcelona (Ph.D. thesis) Available at: <http://ddd.uab.cat/pub/tesis/2006/tdx-1106107-172655/cpp1de1.pdf>
33. Puig-Pla C (2009) L'influence française dans les premiers périodiques scientifiques et techniques espagnols. Les *Memorias de agricultura y artes* (1815–1821). In: Bret P, Chatzis K, Perez, L (eds.) La presse et les periodiques techniques en Europe 1750–1950:51:70. L'Harmattan, París
34. Puig-Pla C (2014) Establecimiento de las primeras cátedras científicas de la Universidad de Barcelona durante el Trienio Liberal. In: Blanco A (ed.) Enseñanza e Historia de las Ciencias y de las Técnicas: Orientación, Metodologías y Perspectivas: 113-119. SEHCYT, Barcelona
35. Puig-Pla C (in press) La Societat Filosòfica de Barcelona 1815–1821. In: Almirall: portal de cultura i pensament del segle XIX [on line]
36. Real Academia de Ciencias y Artes (1906–07) Nómima del personal académico, Barcelona: 113-125. A. López Robert, impresor, Barcelona
37. Reglamento de la Sociedad Médica de Emulación de Barcelona (1841). Imprenta de A. Albert, Barcelona
38. Reseña histórica y guía descriptiva de la Universidad (1929). Universidad de Barcelona, Barcelona
39. Roca A (2014) Reial Acadèmia de Ciències i Arts de Barcelona (1764–2014). Reial Acadèmia de Ciències i Arts de Barcelona / Diputació de Barcelona, Barcelona
40. Sales J (2011) La química a la Universitat de Barcelona. Facultat de Química, Publicaciones y Ediciones de la Universitat de Barcelona, Barcelona
41. Torres Amat F (1836) Memorias para ayudar a formar un diccionario crítico de los escritores catalanes. Imprenta de J. Verdaguer, Barcelona
42. Valls P (1857) Elogio fúnebre del M.I.S. Dr. D. Pedro Vieta y Gibert: leído por el socio Pablo Valls y Bonet en la sesión pública celebrada por la Sociedad Económica Barcelonesa de Amigos del País en 29 de junio de 1857. Imprenta de Joaquín Bosch, Barcelona
43. Vieta P (1814) Discurso inaugural que en la abertura de la cátedra de física experimental establecida en esta ciudad por la Real Junta de Comercio del Principado de Cataluña dixo Don Pedro Vieta catedrático de la misma. Oficina de Antonio Brusí, Barcelona
44. Vieta P (1815) Auroras boreales. Diferencia que hay entre ellas y los fenómenos de luz observados en plagas ecuatoriales de la atmósfera [manuscript report read on April 11, 1815], RACAB Archive 75.28 (CF. 20)
45. Vieta P (1819) Refutacion á las objeciones de Mr. Bodelio contra la pesantez del aire, insertadas en el número de este periódico del mes de setiembre. Memorias de Agricultura y Artes 8:81-85
46. Vieta P, Roura J (1835) Reflexiones físico-geológicas sobre fuentes ascendentes ó artificiales. Imprenta de los Herederos de Roca, Barcelona
47. Vieta P (1841) Reflexiones físico-químicas, sobre incendios. Memoria leída por el socio Dr. D. Pedro Vieta en la sesión pública de 25 de octubre de 1840. Boletín de la Real Academia de Ciencias y Artes de Barcelona 11:72-75
48. Vieta P (1842) Apuntes acerca de la catarata, leídos en la sesión pública de la academia de medicina y cirugía de Barcelona; por el Dr. D. Pedro Vieta (extracto de dicha memoria). Boletín de Medicina, Cirujía y Farmacia 85:103
49. Vieta P (1847) Asignatura de física y nociones de química: programa que ha formado el profesor de dicha asignatura D. Pedro Vieta para la enseñanza de la misma en el curso de 1847 á 1848. Tomas Gorchs, Barcelona
50. Vieta P (1847) Asignatura de ampliación de física: programa que ha formado el profesor de dicha asignatura D. Pedro Vieta para la enseñanza de la misma en el curso de 1847 á 1848. Tomas Gorchs, Barcelona

See on the back cover the photograph of Pere Vieta i Gibert (1779–1856) and in page A2 a brief comment about him. This thematic issue on “Non-equilibrium physics” can be unloaded in ISSUU format and the individual articles can be found in the Institute for Catalan Studies journals' repository [www.cat-science.cat; <http://revistes.iec.cat/contributions>].

