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THE BEGINNINGS OF THE ROYAL MILITARY ACADEMY OF RIO DE JANEIRO

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Abstract

In this paper we aim to analyze the beginnings of the Royal Military Academy of Rio de Janeiro. There will be a brief outline of the Portuguese University Reform of 1772 concerning the creation of the first Faculty of Mathematics in Portugal, a direct inspiration for the mathematics part of the Royal Military Academy. Then we outline the situation in Brazil before and after the arrival of King D. João VI in Rio de Janeiro in 1808. We discuss in detail the founding document of the Academy, examining some of its more innovative aspects. We finish by underlining some of the characteristics of the students at the Academy in its first decade, and we describe some difficult situations affecting the Academy in the same period.

Keywords: Portuguese mathematics; Brazil; 19th century; Royal Military Academy.

Resumo

Neste artigo pretendemos analisar os começos da Academia Real Militar do Rio de Janeiro. Faremos uma breve resenha sobre a Reforma da Universidade Portuguesa de 1772 no que diz respeito à criação da Faculdade de Matemática, a primeira no país, e que foi uma inspiração directa para a Academia Real Militar. Daremos uma panorâmica do Brasil antes e depois da chegada de D. João VI ao Rio de Janeiro em 1808. Discutiremos em detalhe o documento fundador da Academia, colocando em evidência os aspectos mais inovadores. Por último, sublinharemos algumas características dos alunos da Academia na sua primeira década, bem como algumas situações difíceis que nela ocorreram no mesmo período

Palabras-chave: Matemática Portuguesa; Brasil; Século XIX, Academia Real Militar

1. Introduction

The aim of this paper is to give a general overview of the beginnings of the Royal Military Academy of Rio de Janeiro in the period 1810-1820. For this we need to give an outline of the context in which the Royal Military Academy was created. We start by discussing the work done in Portugal by the Marquis of Pombal with regard to the creation of mathematics

studies at university level in Portugal; in particular we will give some data on the structure of the mathematics course at Coimbra University in the first few years after the 1772 University Reform.

To assess the impact of the arrival in Brazil of the Royal Court, we give a brief overview of Brazil as a Portuguese colony before the arrival of King D. João VI in 1808, and contrast it with the changes arising from in the multitude of decrees issued by the King in Rio.

The main part of the paper will be on the Royal Military Academy, showing how it was intended to function, the structure of its courses, the subjects taught, the textbooks used, and the rules for students and teachers.

In the final section there will be some indications of student success and failure in its first ten years. We will also refer to some difficult situations which disturbed the functioning of the Academy in the same period.

2. Mathematics in Portugal, 1750-1807

The period 1550-1750 is generally acknowledged as being a period of cultural and scientific isolation. The causes of this situation, traditionally considered to be a result of the combined action of a powerful Inquisition and the control of the education system by the Society of Jesus[1], are today thought to be more complex[2], and in particular the role of the Society of Jesus during this period has been analyzed in detail[3]. Towards the end of the period, some signs of the need of a reform in the Portuguese education system appeared, most notably the publication in Naples of a book by Luis António Verney (1713-1792), *O Verdadeiro Método de Estudar* (The Genuine Method of Studying) [Verney, 1746]. This book, written as a series of 16 letters, was a criticism of Portugal's cultural isolation and of the dominant way of teaching, and advocated a reform of the Portuguese education system. In particular it called attention to the importance of teaching mathematics and physics.

In 1750 D. José became King, and the Marquis of Pombal became his Prime Minister. Pombal set out to centralize power, and this meant opposing the nobility and the Society of Jesus. The power of the nobility was restrained, and the Society of Jesus was expelled from Portugal in 1759. After an unsuccessful attempt to introduce scientific education to the nobility with the foundation in 1761 of the *Colégio dos Nobres* (College of Nobles), the reform of the Portuguese University was carried through in 1772. Many of the ideas proposed by Verney in 1746 then came into practice. In particular this reform created the first Faculty of Mathematics in Portugal[4].

The King died in 1777, the Marquis was dismissed and there was a return to power of the forces that the Marquis had put down. There were many arrests and dismissals among teachers and students of the University; in particular Anastácio da Cunha (1744-

[1] The first major influential writing on this is [Stockler, 1819]. This overview remained unchallenged for over 120 years.
[2] The first to call attention to this matter was the Portuguese mathematician and historian of mathematics Pedro José da Cunha (1867-1945) in [da Cunha, 1940].
[3] For example, see [Baldini, 2001] and [Baldini, 2004].
[4] On the mathematics of the 1772 Reform, see [Albuquerque, 1990].

1787), the major Portuguese mathematician of the time, was expelled from the University. As a consequence the progress planned in the reform did not materialize.

D. Francisco de Lemos de Faria Pereira Coutinho (1735-1822), known as D. Francisco de Lemos, was the Rector of the University of Coimbra in the period 1770-1779. He was considered one of Pombal's main collaborators in his reform of the University. Consequently, after the death of King D. José, he came under fire, and the main achievements of Pombal's reform were threatened. In order to protect the reform, he wrote[5] [Lemos, 1894] an important document on the state of the University, from the reform to September 1777, which in particular gives us much information on the Faculty of Mathematics.

Using this source, also quoted in [Braga, 1898], and complementing it with [Freire, 1872], and [da Silva, 1858-1870], we can summarize the essential of the contents of the Faculty's four-year course in its beginnings in the following table:

Year	**Subject**	**Teacher**	**Textbooks[6]**
1st	Geometry[7]	José Anastácio da Cunha[8] (1744-1787)	Euclid: *Elements* (Portuguese translation by João Angelo Brunelli[9] (?-1791) Etienne Bézout's *Traité d' Arithmétique*[10] (translated by Monteiro da Rocha)
2nd	Algebra	Michele Franzini (ca.1730-1810)	Etienne Bézout: *Trigonometrie*[11] and *Elements d'Analyse Mathematique*[12]. (both translated into Portuguese, by Monteiro da Rocha and Joaquim de Santa Clara respectively [13] (1740-

[5] This text, although written in 1777, would only appear in printed form in 1894.

[6] Further research will be needed to establish with more confidence which textbooks were used in the Mathematics Faculty in its first decades. Our intention is to give a general overview, and we are only concerned with the period 1772-1807. [Freire, 1872; p. 38] states that in theUniversity there is no written record of the textbooks used, and the list he transcribes includes the textbooks known by tradition to be used in the mathematics course.

[7] Geometry was a compulsory subject for all University courses.

[8] In the first two years of the Faculty the teachers of this subject were successively Michele Franzini and Michele Ciera. Only after these two did da Cunha become teacher in the mathematics Faculty. On da Cunha there are many papers, mainly in the last 20 years. For a general overview see [Youschkevitch, 1973], [da Cunha, 1990], and [Queiró, 1992]. In the last two references information can also be found on the other three lecturers mentioned in this table, mainly on Monteiro da Rocha, the mastermind behind the University Reform. See also [da Silva, 1858-1870] and [Freire, 1872].

[9] Brunelli was a teacher at the Colégio dos Nobres. He translated from the Commandino Latin version Books I to VI, Book XI and Book XII. This was published in 1768, and the Portuguese title page stated that it was to be taught at the *Colégio dos Nobres.*

[10] In a letter from Lemos to Pombal dated October 13, 1773, quoted in [Braga, 1898, p. 515], it is said that this book was also used as a textbook for the first-year course.

			1818))
3rd	Physical-Mathematical Sciences	José Monteiro da Rocha (1734-1819)	Charles Bossut: *Traité d'Hydrodynamique;* Abbé Marie: *Traité de Mécanique* (both Portuguese translations by Monteiro da Rocha)[14]
4th	Astronomy	Michele António Ciera (?-?)	Nicolas Lacaille: *Leçons Élémentaires d'Astronomie*[15]

Table 1: The course structure in the first years of the Faculty of Mathematics

In Portugal it was through the military academies that mathematics was mainly taught, with mathematics papers being written mainly by professional military officers. The importance of these military institutions was due not only to the weakness of the secular institutions, but also to the role of the Armed Forces in maintaining the Portuguese empire. In the last quarter of the 18th century there were the following military academies, all in Lisbon: the *Academia Real de Marinha* (the Navy Royal Academy), founded in 1779, with three-year courses, in which navigation and pure and applied mathematics were taught; the *Academia Real de Fortificação, Artilharia e Desenho* (Royal Academy of Fortification, Gunnery and Drawing), founded in 1790, for the instruction of Army officers, with applied mathematics taught in its military and engineering courses; and the *Academia Real dos Guardas-Marinhas* (Royal Academy of Ensigns), founded in 1782, with three-year courses on nautical and military sciences.

It is also necessary to mention the foundation in 1779 of the *Lisbon Academy of Sciences*, who was to be so important for the future development of Portuguese mathematics. In particular, in the first half of the 19th century it provided the only journal in Portugal in which Portuguese mathematicians could publish their papers. This was the *Memoirs* of the Academy of Sciences. The first volume containing mathematics papers was published in 1797. However, in the beginnings of the Academy mathematics was not a priority, and this was reflected in its statutes. The Academy had three classes, and mathematics was included in the Second Class, named *Ciências de Calculo* (Computation

[11] [Freire, 1872] says that this textbook was traditionally said to be used in the second year.
[12] This is referred to in [Lemos, 1894, p. 517] as "Algebra" and in [da Silva, 1858-1870, vol. 4, p. 73] as "Elements of Algebra and Calculus".
[13] Santa Clara was a Benedictine, teacher of Theology at Coimbra University. His translation would be revised and somewhat expanded by a teacher of the Mathematics Faculty, José Joaquim Faria (1759-1828), in two further editions, both printed in Coimbra, the last in 1825.
[14] [Freire, 1872] also mentions Lacaille's *Optics* as a textbook for the third year.
[15] There is no indication of this book being translated into Portuguese. Coimbra University Press published the original French textbook in 1812, which suggests that no Portuguese translation existed at the time. In [Freire 1872] there is mention of the textbook for the fourth year being Lalande's *Astronomy*, but this might be the fourth edition of Lacaille's textbook which was revised by Lalande.

Sciences). In these early stages there was a stress on economics papers[16], many of the academicians holding the view that there was a national priority in developing agriculture in order that the country could become self-sufficient.

3. Brazil before 1808[17]

In order to maintain the intellectual dependence of the colony and to control the diffusion of knowledge, the Portuguese did not allow either the press or higher education studies in Brazil before the establishment of the Portuguese court in Rio de Janeiro. In those times only the Church and the military had forums to teach scientific knowledge. The fact that Brazil's economy was mainly based on slave labor in agriculture and on the export of goods did not encourage the implementation of new techniques and consequently it was not a factor in the demand for new scientific practices and knowledge.

Some academies were founded during the 18th century, but they did not last long and they had no influence on the diffusion of scientific knowledge. In this the great distances between towns, with none of them acting as a centralizing focus, was also a factor that reduced their impact. Among the more important we have:

1724- *Academia Brazileira dos Esquecidos* [Brazilian Academy of the Forgotten], in Salvador;
1736- *Academia dos Felizes* [Academy of the Happy Ones], in Rio de Janeiro;
1752- *Academia dos Selectos* [Academy of the Chosen Ones], also in Rio;
1771- *Academia Científica do Rio de Janeiro*[18] [Scientific Academy of Rio de Janeiro].

Probably the most important of all the pre-1808 institutions was the Seminary of Olinda[19], in Pernambuco. This was founded in 1800 by Bishop Azeredo Coutinho, who had studied in Coimbra's Faculty of Law and had returned to Brazil in 1798. The Seminary had the structure of Lisbon's *Colégio dos Nobre*s. According to [de Oliveira, 2005, p. 88] this was the first Brazilian institution to be founded under the influence of Pombal's reform. It added a new science component, with the introduction of topics of Mathematics, Physics and Natural Sciences. French and Greek were also included in the curricula. It is also indicative of a new attitude towards science that the state supported the founding of the seminary. Among the subjects taught were geometry, natural history, chemistry and natural philosophy. Concerning the last of these, it was stipulated that the teacher should explain experimental physics, including mechanics, hydrostatics, and the principles needed to understand machines and their power[20].

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[16] After its foundation in 1779, the Academy published several volumes of *Economic Memoirs* and of *Litterature Memoirs* before issuing any volume of *Memoir*s which included mathematics. It is significant that the latter was only published 18 years after the establishment of the Academy. On the Lisbon Academy of Sciences, and specifically on Portuguese mathematics in the 19th century,e see [Saraiva, 2000].

[17] On this subject, and on the subject of the next chapter, our main reference is [de Oliveira, 2005].

[18] Concerning this Academy, there are records that show that its general secretary maintained correspondence with the Swedish Royal Academy of Sciences; it is significant also that the Academy's regulations stated that at their meetings debates should be based on clearly written texts which had been in some way scientifically approved [de Oliveira, 2005; p. 95].

[19] For more detailed information on the Olinda Seminary, see [das Neves, 1984].

[20] Among the Olinda staff was the Franciscan Friar José da Costa Azevedo (1763-1822), later a Minerology teacher at the Royal Military Academy of Rio de Janeiro.

Although there were no printing presses in Brazil, the written word arrived from Europe regularly, either brought by people crossing the Atlantic or through bookshops. According to [Cavalcanti, 2003], between 1754 and 1805 there were at least 23 bookshops in Rio de Janeiro. Although censorship was always present, Cavalcanti states that he did not see a single technical book in the lists of forbidden books. We can get some idea of the books available through an analysis of the inventory that he produced of a bookshop in Rio in 1794. He mentions that there were 6,540 books. Of these, the vast majority (about 86%) were religious books, but still there was a significant minority of books on cultural matters – art, theater, poetry and opera – and on didactic themes, respectively 531 books (about 8.2%) and 214 (about 3.3%). Of the last category, 47 books were on scientific matters, including 10 trigonometry and multiplication tables, 7 books on the elements of arithmetic, 6 architecture books, 4 pharmacy books, and 3 botany textbooks.

4. D. João VI in Brazil, 1808-1810

Following the invasion of Portugal by Napoleon's armies in 1807, King D. João VI decided to leave Europe and to go with his court to Rio de Janeiro, where they arrived on January 22, 1808. Fifteen thousand people left Lisbon with the King for Brazil. Their arrival had an immense impact on Brazilian life. Not only did the nobility at least double in number, but also the population of Rio increased by between 20 and 30%. One month before the King, the Royal Academy of Ensigns left Lisbon for the same destination, arriving in Guanabara Bay on January 18, 1808. They chose S. Bento Monastery as their new home. The war had unexpected good consequences in the field of diffusion of ideas. In compensation for Britain's help in the war against France, the Brazilian ports were declared open to what were labeled "friendly nations", which in fact had very bad economic consequences for the Portuguese crown. However this made the diffusion of ideas simpler, as many foreigners entered Brazil between 1808 and 1822. In Rio alone there is a record of 4,234 arrivals, of whom 1,600 were from Spanish South America, 1000 French, 600 British and over 200 Germans [Manchester, 1970; p.216] quoted by [de Oliveira, 2005; p.122]. Until 1808 only people born in the Portuguese Empire were authorized to compile data on scientific expeditions in Brazil. From 1808 onwards foreign scientific expeditions were encouraged to do research in Portuguese-controlled territory, a clear sign of a change in mentality in the Portuguese authorities.

With the King and his Court living permanently in Rio, it became urgent to create a set of structures which until then had been denied to Brazil in order to maintain its dependent status on European Portugal. Thus a series of decrees started to change the face of the colony. It began with a declaration on January 28, 1808, that from that moment onwards Brazil was the center of the Portuguese Empire; on March 1 the right to the free establishment of factories was granted; on March 7 the Military Archive was created, with the aim of preserving and collecting all maps and charts, to copy them for border reassessments, fortress plans, and planning new roads. It was also decided to publish a book on topography aimed at perfecting geodesic measurements that would be the counterpart of an annually published French topography handbook. On May 13 the gunpowder factory was founded, with a well-educated board and inspectors; the same day the *Imprensa Régia* (Royal Press) was created, which printed the first textbooks of mathematics, chemistry,

physics and others used in higher education. The following year, on April 23, 1809, there was the foundation of *Colégio das Fábricas* (College of Factories), the first establishment in Brazil for teaching technical trades to people coming from Europe lured by the possibilities of working in Brazil.

In the 1820s there were 13 periodical journals in Rio. *O Patriota* (The Patriot), although it lasted less than two years, was of paramount importance[21]. It began publication in 1813 on a monthly basis, and in 1814 it was published twice a month. It ceased publication in December 1814. Its director was Manoel Ferreira Araujo Guimarães (1777-1838), a teacher at the Royal Military Academy of Rio de Janeiro, who had previously been a lecturer at Lisbon's Navy Royal Academy. This was Brazil's first cultural journal, and included articles on pure and applied science side by side with literary and historical memoirs, translations, poems, and news. Some of the most prestigious members of Brazil's scientific community contributed to this journal, among them José Bonifácio de Andrada e Silva (1763-1838), a naturalist and one of the most important figures in the struggle for Brazil's independence; Francisco de Borja Garção Stockler (1759-1829), mathematician, historian of Portuguese mathematics and a previous secretary of Lisbon's Academy of Sciences; and José Saturnino da Costa Pereira (1773-1852), mathematician and lecturer at the Royal Military Academy.

Among journals which were published outside Rio it is worth mentioning *A Idade de Ouro do Brazil* (Brazil's Golden Age), the first periodical newspaper published in Bahia, of which there were over 120 issues between 1811 and 1819. It was essentially of local interest, as it published mainly local economic news.

Last, but not least, there were two Portuguese periodicals published in England that were also read in Brazil, *O Investigador Portuguez em Inglaterra* (The Portuguese Researcher in England) and *O Correio Brasiliense* (The Brazilian Mail).

5. The foundation of the Royal Military Academy of Rio de Janeiro

5.1. Introduction

By a Decree of December 4, 1810, the new military Academy was founded. In its preface, it is stated that that the main reason for the founding of the academy is the need for trained staff at a higher level, for new learned military staff that would not only be able to provide proper leadership in military matters, but also be competent in administrative posts, mainly those concerning trade and communications:

[...] Considering that it is very important to my Royal Service, to the public welfare of my subjects, and to the defense and security of my vast domains, that it is established in Brazil, in my present Court and in the city of Rio de Janeiro a regular course of exact sciences, and of observational sciences, as well as all those which are applications of these to military and practical studies [...] such that from these courses there will graduate skillful Artillery and Engineering Officers, and also Officers from the Class of Geographic and Topographic Engineers, who can have the useful task of directing administrative matters in

[21] On this journal see [de Oliveira, 2004].

mining, roads, ports, channels, bridges, waterworks and pavements; I hereby establish in my present Court and city of Rio de Janeiro a Royal Military Academy with a complete course of Mathematical Sciences, of Observational Sciences, such as Physics, Chemistry, Mineralogy, Metallurgy Natural History, which will include the plant and animal kingdoms, and of Military Sciences in all its range, as well as of Tactics and Fortification and Gunnery […][22]

It is clear that there were high hopes that the success of the Academy would bring a new generation of highly qualified officers, and to encourage enrolment in the Academy by those who wanted to follow a military career many privileges were given.

The Decree [Collecção, 1826], a 13-page document in twelve chapters (in Portuguese, *Titulos*), describes in detail how the Academy should function. Everything is regulated; one feels that there was a desire to leave as little as possible to chance, to guarantee the good functioning of the institution. There was an implicit recognition that all involved needed well-defined guidelines in order to accomplish their tasks properly.

We shall analyze some of the most important features of this document.

5.2. The Military Board

It is stated in the decree that the Academy is directed by a Military Board, the *Junta Militar,* who report to a General Inspectorate, appointed by the Minister and the Secretary of State for War.

Chapter I is on the Military Board, its composition and its duties. It was laid down that it should have at least five members, called deputies: its President, who had to be a Lieutenant-General of the Gunnery Corps or Engineering Corps; and at least more four members, all at least of the rank of Colonel, one of them being the Director of the Royal Military Archive. The Board should have monthly meetings, and extra meetings could be held at the request of either the President or the General Inspector. They were to have meetings before the beginning of the academic year, in order to discuss questions such as the admission of students in the different classes, as students were admitted in the Academy only on a favorable resolution by the Board, or motions to the King to improve the courses or the Academy or to suggest changes in the textbooks. Another meeting was to be held at the end of the academic year, just before the examinations. At this meeting there was discussion on the duration and form of the exams, and on any changes that should be proposed to the King; on the reports on the work done by students during the academic

[22] "[...] Tendo consideração ao muito que interessa ao Meu Real Serviço, ao Bem Público dos Meus Vassallos, e á defensa e segurança dos Meus vastos Domínios, que se estabeleça no Brazil, e na Minha actual Corte e Cidade do Rio de Janeiro, hum Curso regular das Sciencias exactas, e de Observação, assim como de todas aquellas, que são applicações das mesmas aos Estudos Militares e Práticos [...] de maneira, que dos mesmos Cursos de estudos se formem habeis Officiaes de Artilharia, Engenharia, e ainda mesmo Officiaes da Classe de Engenheiros Geographos e Topographos, que possão tambem ter o util emprego de dirigir objectos administrativos de Minas, de Caminhos, Portos, Canaes, Pontes, Fontes e Calçadas; Hei por bem, que na Minha actual Corte e Cidade do Rio de Janeiro, se estabeleça huma Academia Real Militar para hum Curso completo de Sciencias Mathematicas, de Sciencias de Observação, quaes, a Physica, Chimica, Mineralogia, Metallurgia e Historia Natural, que comprehenderá o Reino Vegetal e Animal, e das Sciencias Militares em toda a sua extensão, tanto de Tactica, como de Fortificação, e Artilharia,[...]" [Collecção, 1826, p. 935]

year, which they had to send to the King on a yearly basis; on the teachers or other examination officers who should be responsible for the exams; and on the students to be nominated for prizes, considering the reports of the teachers of the Academy. This chapter also defined the tasks of each member of the Board: the President superintended Mineralogy, Physics and Chemistry Studies; the director of the Royal Military Archive directed, and took part in the Geodesic studies. Here the decree mentions explicitly which models should be followed: le Roy in England, and Delambre in France. The second deputy was in charge of the equipment and discipline in the classes, and in the Academy in general. The other two deputies were solely responsible for military subjects. The third deputy assisted with the Gunnery exercises, and was responsible for building a military polygon in the Academy to illustrate the attack and defense of fortresses. Finally, the fourth deputy had to assist with field reconnaissance and tactical maneuvers, and to monitor the sketches on military maps of military maneuvers that the students had to produce in practical ways and with no instruments.

5.3. The Academy's Course

In the Coimbra reform of 1772 it was stipulated that the teachers should write their own textbooks. However this was not successful: the only original textbook written by a Coimbra Faculty of Mathematics teacher before 1808 was not approved for teaching in the Faculty, and was only published as part of a bigger work after the author's death (*Principios Mathematicos* by José Anastácio da Cunha). Perhaps because of this, the legislators wrote in Chapter III of the decree:

The appointed teachers can neither gain promotion nor obtain rewards and favor unless they have organized and written their textbooks according to the method stipulated in the Statutes, and their works are approved by the Military Board.[23]

This clearly seems to have been effective, as the majority of books listed in the Statutes of 1810 were translated in the period 1809-1814, frequently with extensive annotations, and some original textbooks were also written during this period.

The course was designed to last seven years, of which the first four corresponded to the Mathematics course, and the last three to the Military Sciences course. The material to be taught, the recommended textbooks, and the number of teachers and of substitutes were all regulated in Chapter II, the longest of the twelve chapters of the decree.

5.3.1. First to Fourth Year (Mathematical Sciences)

We shall now examine for the first four years which subjects were taught, the recommended textbooks, their translations by Academy teachers (year of publication in brackets), and the major guidelines for teachers. The titles of the original works will only be

[23] "Os Lentes, que forem nomeados, não poderão ser adiantados em Postos, nem obter recompensas, e Graças, sem que cada hum delles tenha organizado e feito o seu Compendio pelo methodo determinado nos Estatutos, e sem que o seu trabalho seja approvado pela Junta Militar" [Collecção, 1826; pp. 940/941]

given if they are mentioned explicitly in the decree. There was one mathematics teacher per year.

First Year:

Subject	**Textbooks**	**Translations**
Arithmetic	S. F. Lacroix	F.C.S.T. Alvim: *Tratado de Aritmetica* (1810)
Algebra (up to 3rd and 4th order equations)	S. F. Lacroix L. Euler: Elements of Algebra	F.C.S.T. Alvim: *Elementos de Algebra* (1812)[24] [Lacroix] M.F.A. Guimarães: *Elementos de Algebra* (1809) [Euler] M.F.A. Guimarães: *Complementos dos Elementos de Algebra de Lacroix* (1813)[25]
Geometry	A. M. Legendre	M.F.A. Guimarães: *Elementos de Geometria* (1809)
Trigonometry (including basic notions of spherical trigonometry)	A. M. Legendre	M.F.A. Guimarães: *Tratado de Trigonometria* (1809)

Table 2: Subjects of the mathematics class of the first year of the Royal Military Academy

There are two important guidelines that are emphasized from the first year of the course: firstly there is an explicit recommendation to show connections between the different parts of mathematics, its inner coherence (the decree refers to its "beauty") and their application to the real world; in particular it mentions the connections between the principles of algebra and those of geometry, and the applications of trigonometry to geodesy; secondly it encourages the teachers to encourage research among students:

[...] to try hard to make them [the students] work on problems, and try to develop that spirit of invention which in Mathematical Sciences brings the great discoveries.[26]

It further states that the textbook that each teacher in the Academy should write not only had to include the material covered in the recommended textbooks but also any new methods and innovations that might be discovered. So it is not only the Academy student that is encouraged to be inventive in his work, but also the teacher, who must be aware of the new knowledge continually being produced by the international community.

[24] Although the date 1811 is given in the book, it was only published in 1812.
[25] In the Preface it is stated that this book aims to compensate for the lack of a translation of the second volume of Euler's Elements of Algebra.
[26] "[...] trabalhando muito em exercitallos nos diversos Problemas, e procurando desenvolver aquelle espirito de invenção, que nas Sciencias Mathematicas conduz ás maiores descobertas" [Collecção, 1826; p. 937]

It is also stated that in the first year they should have a class of Drawing[27], immediately after the Mathematics class, and lasting the same time.

Second Year:

Subject	**Textbooks**	**Translations**
Revision of the calculus notions taught in the 1st year		
Methods of solving equations; Applications of algebra to the geometry of lines and curves (degrees 2 and higher)	S. F. Lacroix: Principles of Algebra	F.C.S.T. Alvim: *Elementos de Algebra* (1812) J.V.S. Sousa: *Tratado Elementar de Applicação da Algebra à Geometria* (1812) -translation of another Lacroix book-
Differential and Integral Calculus (and applications to physics, astronomy and probability calculus)	S. F. Lacroix: Differential and Integral Calculus	F. C. S. T. Alvim: *Tratado Elementar de Calculo Differencial e Calculo Integral*. Two volumes: (Part I:1812; Part II: 1814)

Table 3: Subjects of the mathematics class of the second year of the Royal Military Academy

This part again emphasizes the connections between different parts of mathematics and its applications to the real world (mechanics, hydrodynamics, optics).

The second year students are also to have another class: on alternate days they attend Descriptive Geometry (textbook: G. Monge[28]) and Drawing.

Third Year:

Subject	**Textbooks**	**Translations**
Principles of Mechanics (Statics and Dynamics)	L. B. Francoeur	J. S. C. Pereira: *Tratado Elementar de Mechanica* – 4 volumes (1812)
Principles of Hydrodynamics (Hydrostatics and Hydraulics)	L. B. Francoeur is the main reference; Prony, Abbé Bossut, Fabre and Gregory (for machines and their applications)	

[27] Roberto Ferreira da Silva (?-?), substitute teacher of the class of Drawing at the Academy, wrote a textbook, "Elements of Drawing, Painting, and General Rules of Pespective", which was published in 1817.

[28] Translated into Portuguese by José Vitorino dos Santos e Souza (1780-1852), teacher of Descriptive Geometry at the Academy, as "*Elementos de Geometria Descriptiva com applicações às Artes*" (1812).

Theory of Ballistics	E. Bezout, B. Robbins and L. Euler	

Table 4: Subjects of the mathematics class of the third year of the Royal Military Academy

It is recommended that the school should gradually build models of the machines studied for the students' use. Also all theoretical aspects of ballistics should be studied, so when the students came to the Gunnery class they only had to study practical uses derived from theoretical principles. Students also had a Drawing class twice a week.

Fourth Year:

Subject	**Textbooks**	**Translations**
Spherical Trigonometry	A. M. Legendre	M.F.A. Guimarães: *Tratado de Trigonometria* (1809)
Optics, Catoptrics, and Dioptrics	N. L. Lacaille	A. P. Duarte: *Tratado de Óptica* (1813)
System of the World	J. J. L. F. Lalande, P. S. Laplace: Celestial Mechanics	
Geographic maps, and projection techniques; Globe Geography	P: S. Laplace, N. L. Lacaille, J. J. L. F. Lalande, J. Pinkerton's Geography	

Table 5: Subjects of the mathematics class of the fourth year of the Royal Military Academy

Concerning Laplace's Celestial Mechanics, the decree advised the teacher not to go into its theories, because "there would not be sufficient time", but instead recommended that he should use its results for practical problems, like computing latitudes and longitudes, or to obtain results in geodesy.

Fourth-year students had another two classes: Physics was taught every day except two: on those two days the students had a Drawing class, in which they drew figures and machinery thatthey studied in the fourth year. For Physics the main recommended textbook was Abbé Hauy's *Elements of Physics*[29]; another reference given in the decree for the Physics course was Brisson's textbook on physics.

To complete this first outline of the Mathematics course it is important to note the huge task accomplished by the Academy's lecturers in translating textbooks. Up to 1814, 16 major works were translated[30], 5 in the period 1809-1810, all published in Rio de Janeiro

[29] This was translated into Portuguese by Francisco Cordeiro da Silva Torres e Alvim (1775-1856), once a teacher of the sixth year subject on Fortification, etc, as "*Tratado Elementar de Physica*" (1810)

[30] Francoeur's *Mechanics* is a set of four books respectively on Statics, Dynamics, Hydrostatics and Hydrodynamics.

by the *Imprensa Regia*. The fact that five of them were published during 1809/1810 suggests that this project may have started as early as 1807. By the end of 1815 all the textbooks mentioned in the decree for the first two years of the course had been translated, and all the other major works mentioned in the decree were either translated or had Academy teachers writing textbooks on those matters. For instance, Manoel Ferreira de Araujo Guimarães published textbooks on astronomy (1814) and on geodesy (1815), and had written a short text on spherical triangles (1812). Guimarães also published on military matters: he translated Jean de Briche's *Engineer's Handbook or Practical Geometry for Encampment Fortification* published in Bahia, with a second edition out in 1815[31]. Some translations had the mark of the translator, as they were sometimes greatly expanded by incorporating data from other textbooks, such as Costa Pereira's translation of Francoeur's *Mechanics,* in which he included material from books by Prony, Bossut and Marie.

5.3.2. Fifth to Seventh Years (Military Sciences)

The last three years of the course, which form the Military Sciences course, are less detailed in the decree: while there are over two pages for the specifics of the mathematics four-year course, there is just half a page for the guidelines of the three years of the Military course. Here the decree limits itself to enumerating the subjects to be studied and the textbooks that are recommended. No extra details are given, in contrast to the part for the Mathematics course. Possibly because of the novelty of a complete mathematics course taught by professional military personnel, there was a feeling that the teachers should be given more information than simply an indication of subjects and textbooks. With the Military Sciences course this was not the case, as the course was not a novelty. We shall show in tables the contents taught and textbooks recommended. We did no research on the military textbooks translated by the Academy's lecturers. One of them is by João de Sousa Pacheco Leitão (1770-1855), at one time teacher of the fifth year (Tactics, Strategy, etc), who translated Guy de Vernon's *Elementary Treatise of Fortification and Military Art* (1813); another is the translation of Jean de Briche by M. F. A. Guimarães mentioned above.

There were two subjects taught per year, with a teacher for each subject, that is, two teachers per year of the course.

Fifth Year:

Subject	**Textbooks**
Tactics; Strategy; Castrametation, Encampment fortification;	Vernon, Cessac

[31] In a future paper I intend to analyze the works and translations of the Royal Military Academy's teachers in the early 19th century.

Field reconnaissance	
Chemistry[32]; Docimastic methods for the knowledge of mines	A.L. Lavoisier, J. L. Lagrange, Vauquelin, Fourcroi, Chaptal

Table 6: Subjects of the fifth year of the Royal Military Academy

Sixth Year:

Subject	**Textbooks**
Fortification (regular and irregular); Attack and Defense of Fortresses; Principles of Civil Architecture	Guy de Vernon, Abbé Bossut, Muller
Mineralogy (use of Verner's method)	Napion's *Elements*, Hauy, Brochant

Table 7: Subjects of the sixth year of the Royal Military Academy

On two days a week the students attended a Drawing class instead of Mineralogy.

Seventh Year:

Subject	**Textbooks**
Gunnery; Mines; Subterranean Geometry	Roza (on mines)
Natural History (Animal and Plant Kingdoms)	Linné, Jussieu, Lacepede

Table 8: Subjects of the seventh year of the Royal Military Academy

The complete course was only compulsory for Engineering and Artillery officers; for Infantry and Cavalry officers it was enough to have passes in the first year of the Mathematical course and in the first year of the Military Sciences course (that is, the fifth year of the complete course) to graduate from second lieutenant to higher ranks (*Chapter VII*).

5.4. On the Academy's teachers

Besides the appointed teachers, the decree stipulated that there should be five Substitute teachers, in order to guarantee that there would not be classes that did not function in subjects where there were registered students. The chapter ends with a recommendation: it said that, when conditions allowed, a Scientific and Military Library should be founded,

[32] Daniel Gardner, once a teacher of Chemistry at the Academy, published "*Syllabus ou Compendio das Lições de Chimica" (1810)*. We have virtually no data on him, only that he was known to be still living in Rio de Janeiro in 1825.

and its librarian would be the teacher of Military History, a subject to be taught in a future eighth year of the course.

Chapter III mentions that the publication of *Memoires* is a criterion for the appointment of teachers and their substitutes. To encourage the military to apply to the Academy, it is stated that they have the same privileges as teachers in the Lisbon Military Academies of the Navy and of the Army. It is also guaranteed that after 20 years of teaching in the Academy they are entitled to retire. As for wages, teachers have 400,000 *reis* per year besides the pay due to their rank. The substitutes are to be paid 200,000 *reis* per year, but if they are reassigned, making it impossible for them to contribute to the teaching of their subjects, they will receive no pay. In Chapter X it is also stated that the Academy's teachers will also have the same privileges as University of Coimbra teachers.

5.5. On the Academy's students

This is the subject of Chapter IV. In it the conditions of admission are established: the students must know the four elementary operations and be at least 15 years old. Among those eligible, preference will be given to those who are acquainted with Greek, Latin, or any living languages. There will be two classes of students: compulsory and voluntary.

The Academy tried to provide incentives for the students' work, and above all for the compulsory ones, who were by far the larger group of students in the Academy. So the compulsory students were the only ones eligible to be given *partidos*, honors given to those who distinguished themselves in the Academy's studies. There were also monetary penalties for those who did not do well in the exams. From the moment they entered the Academy they received the pay of Artillery sergeants. But those who did not completely pass the annual final exam had their pay reduced to that of a private (Chapter XI). The Military Board also had the power to expel from the Academy those who failed the exams in two consecutive years and were considered to have no hope of improving their situation.

The Royal Academy students were declared to have the same privileges of the University of Coimbra students (Chapter X). Also, when officers of equally good records applied for promotion, those who had completed the Academy's seven-year course with good marks should be selected. With the purpose of improving military leadership, it is also stated that during peace-time no officer could have the rank of General or higher without having completed the Military Course. This last rule only concerned those who joined the Army after the date of this decree (Chapter VII).

As said above, research was also encouraged. There were three prizes of 250,000 *reis* each for those who, each year, presented the best essays, which had to include some discovery or some useful application of science. The Military Board was to be the jury for their selection, and it had the authority to publish them if they felt they deserved it (Chapter XI).

Good students would be favored in applications for promotion, and it was stipulated that two-thirds of the officers' places should be filled from the ranks of Academy students who had completed their courses with good marks and with exemplary behaviour in the King's Service (Chapter VII).

5.6. On lectures, discipline, and examinations

Each lecture lasted 90 minutes. Each morning there were two or three lectures, starting about 7.30 /8.00 and finishing at 11.00/12.00. There were no classes on Thursday if no other day of the week was a holiday. The term went from April 1 to Christmas Eve. Exams were held in January (Chapter VI).

The decree detailed how classes should be organized. The teacher would explain the subject matter in the first half of the class, and in the second half the students should summarize the previous class. It was advised that each Saturday the teacher should repeat what he had taught during the week, and then he should try to show to the students the connections between what he had told them during the week. He should also show the consequences of the results proved and the different possible methods of obtaining them, thus preparing the minds of the students for their own research.

The practical exercises were considered to be not only a means to perfecting and consolidating the student's apprenticeship, but also an opportunity for the Board to estimate the teachers' merit:

The teachers are obliged to go on field practice with their students, to instruct them in the practice of what they learn in the classroom. So the Geometry teacher will make them acquainted with the instruments and their practice, by measuring inaccessible distances and heights […] The teachers attend all this, and they themselves have to perform them, not only for the instruction of their pupils, but also for the Board to estimate their merit, and confirm to me [that is, the King] *that they deserve the assessment they are awarded.*[33]

There are also some indications in Chapter VIII on the discipline that should reign in the classroom and in the Academy, emphasizing the teacher's authority and powers of decision, but allowing some flexibility.

There is emphasis on punctuality, but above all on the need for the students to attend the classes. If the student arrived more than 6 minutes late he would be reported as absent, unless he had some reasonable justification, accepted by his teacher. The students had to stay until the end of each class; if they left before the end they would be declared absent. Again exceptions were possible if the teacher considered that there was a valid reason for the early departure. As an indication of the importance of attendance, and the need for strict control, the decree states that it is compulsory for teachers to keep a record of the classes missed by their students.

Classes are to be followed in silence, except when summarizing the lesson or answering a question. Respect and obedience to the teacher are essential. Three infringements meant a public admonition, a repeated offense could result in expulsion from the class, and a report to the Board, with possible disciplinary action to follow.

[33] "Os Lentes serão obrigados a sahir ao Campo com os seus Discipulos, para os exercitar na prática das Operações, que nas Aulas lhes ensinão; e assim o Lente de Geometria lhe fará conhecer o uso dos instrumentos, e a prática, medindo distancias e alturas inacessiveis[…] a todas estas Operações assistão os Lentes, e que elles mesmos as executem, não só para ensino dos Discipulos , mas ainda para que a Junta avaliando o seu merecimento Me consulte a justa consideração de que se fazem merecedores" [Collecção, 1826; p. 944]

The Decree also innovated on the rules for examination. There were two possible kinds of examination. In the first, the only one that counted for awards and *partidos*, each examiner would choose one point for examination questions, then give the textbook to the student for him to read the relevant material. Then he would close the book and answer the questions asked. In this way it is clear that what was required from the student was not only knowledge of the contents of the textbook, but also the knowledge of how to use it as a book. Memorized knowledge is needed, but complemented by the capacity to use a textbook.

As an alternative, not eligible for any prizes, there was the possibility of certain subjects being chosen in advance, and the examinee would choose one at random for the examination.

6. The first ten years: 1810-1820

In what follows we will give a general overview of some of the problems in the Academy which weakened its functioning and diminished the impact that it could have had on Brazilian society[34]. In this chapter we shall use documents of the Arquivo Nacional do Rio de Janeiro[35]. First we will analyze students' performance in the Academy. The earliest surviving list of results of the Academy is from 1812. This contains the results for the first three years of the Mathematics course. The results were far from brilliant: of the 43 first year students, only 22 took a final exam, and of these 16 passed. As to the second year, the results were a little better: there were 25 students enrolled, 16 took the final examination, of whom 14 passed. In the third year the six students enrolled, all from the Court's Artillery Regiment, passed their exams, a completely atypical result. Although this was a military school, it also admitted civilian students. In 1812 the final results show that there were four civilians attending the first year (two passed) and one in the second year (he succeeded in the exam). The following year there were three civilians in the first year, one in the second, and one in the first military year. Only the last two passed their exams. We present the results for 1812, 1813 and 1817:

1812	Enrolled	Attended the exam	Passed the exam	Failed the year
1st year	43	22	16	24
2nd year	25	16	14	8
3rd year	***6***	***6***	***6***	***0***
Total	*74*	*44*	*36*	*32*

Table 9: Results of the Royal Military Academy for 1812.

[34] In a future paper we intend to analyze academic records in the Royal Military Academy in this period in more detail.

[35] All these documents are in Códice 807, IG3 2 of *Arquivo Nacional do Rio de Janeiro.*

1813	*Enrolled*	*Attended the exam*	*Passed the exam*	*Failed the year*
1st year	*11*	*5*	*4*	*7*
2nd year	*14*	*10*	*9*	*4*
3rd year	*14*	*12*	*12*	*2*
Physics[36]	*6*	*6*	*6*	*0*
1st Military year	*14*	*12*	*12*	*2*
Total	*59*	*45*	*43*	*15*

Table 10: Results of the Royal Military Academy for 1813

1817	*Enrolled*	*Attended the exam*	*Passed the exam*	*Failed the year*
1st year	*26*	*4*	*4*	*22*
2nd year	*12*	*5*	*5*	*7*
3rd year	*6*	*0*	*0*	*6*
4th year	*4*	*0*	*0*	*4*
5th year	*10*	*2*	*2*	*8*
6th year	*6*	*2*	*2*	*4*

[36] The six students enrolled in this subject are the same six from the Court's Artillery Regiment that the year before passed their third year exams. They are not on the list of students of the first military year course, so either the examination results for the fourth year course are missing or the fourth year did not exist in 1813.

7th year	***6***	***0***	***0***	***6***
Total	***70***	***13***	***13***	***57***

Table11: Map of results of the Royal Military Academy for 1817[37].

Although it was not possible to obtain all the yearly examination lists for the period, from the existing lists and from some letters from the Board it seems that the low percentage of students passing the year was a constant problem in the Academy's first decade. In this respect, 1813 seems to have been an exception, as over 70% of students passed their exams. The sum of the fourth and fifth columns in some cases can be less than the corresponding value of the second one because there were students who left the course during the academic year, for personal, professional or disciplinary reasons.

We also see the high percentage of passes in the exams: 81.8% in 1812, 95.5% in 1813, and 100% in 1817. The problem, it seems, was not the exams but the ability to make the students interested in the material which they were taught in the academy's lessons. We can see the disappointing results of the 1817 year, when only about 18.6% of the students passed their exams, with 100% failure in the third, fourth and seventh years.

We know from letters in the National Archive that the teachers were having financial difficulties, not only because their wages were low, but also because they were not being paid. In a letter of January 11, 1813 four teachers[38] requested for all textbooks used in the Academy to be given free to the lecturers, stating that not only was their cost (40,000 *reis*) too high for their salaries, but also their wages had not been paid for a long time. This petition was approved by the Board, who in a letter of April 3, 1813 wrote to the General Inspector in support of the petition, and also asked that the textbooks might be sold to first-year students at cost price, with no profit, and that for students who passed in the first year with the best marks the textbooks might be free, suggesting that for the majority of students the textbooks were too expensive. We have no record of the Inspector's answer, if any.

There is also a letter (only dated 1813, with no more precise date) in which ten teachers[39] of the Academy ask for their wages to be upgraded and made equal to those of teachers in the Royal Academy of Ensigns and in the Medical-Surgical Academy, who earned 600,000 *reis* per year, that is 50% more than the Military Academy's lecturers. The

[37] This list also includes the results of examinations in Mineralogy (7 enrolled, 2 passed, 5 failed), Chemistry (10 enrolled, 3 passed, 7 failed) and Zoology and Botany. Here it only says 6 enrolled, and no results are shown, so probably the course either did not exist in that year or for some reason stopped before the end of the academic year. Therefore for 1817 we have a total of 93 students enrolled, of whom only 18 passed the year, while 69 failed.

[38] They were Manoel Ferreira Araujo Guimarães, Jozé Saturnino da Costa Pereira, António Jozé do Amaral and Vasco Jozé de Paiva.

[39] Three of them had signed the previous letter: Manoel Ferreira de Araujo Guimarães, Jozé Saturnino da Costa Pereira and António Jozé do Amaral. The others were: Manoel da Costa Pinto, Jozé de Sousa Pereira Leitão, Jozé Victorino dos Santos e Souza, Frei Pedro de Santa Marianna, Rafael Fortunato dos Reis, Joáo Jozé de Souza and Daniel Gardner.

lecturers also requested an equivalent raise for the substitute teachers (to 300,000 *reis* per year).

From 1815 to 1820 Francisco de Borja Garção Stockler[40] (1759-1829) was the President of the Military Board. From the Board over which he presided we have letters that show some of the problems the Academy was facing: the fall in the number of students enrolled and discipline problems, among both students and teachers.

On February 17, 1816 the Military Board, aware that the number of students enrolling in the Academy was continuously falling, wrote to the Chiefs of Staff of all Army Corps in Brazil, to try to reverse the trend. The letter said that they should emphasize to the most able cadets, soldiers and officers that only by enrolling at the Academy could they get the most complete military instruction. Army service permitting, they should exempt from duty some of their best officers and soldiers and ask them to enrol at the Academy. They should, the letter adds, point out the privileges of the students of the academy, namely that two-thirds of promotions were reserved for those who successfully completed the Academy's courses. Again we have no indication if there was any response to the letter.

Later that year, on August 28, in a letter addressed to D. Fernando Jozé de Portugal, Marquês de Aguiar (1752-1817), the General Inspector in the period 1814-1816, the Military Board comments on the problems caused by the lack of teachers and substitutes. It is mentioned that the resolution of the decree of December 4, 1810, stating that all teachers could substitute for each other to avoid the suspension of classes only worked in theory, as in real life the subjects taught included such a wide spectrum of knowledge that a lecturer would have difficulty in teaching other matters than his own. The letter shows that theoretical planning frequently underestimates unexpected setbacks: the teacher of Physics was summoned to work for the Secretary of State, one substitute teacher died, and the teacher of the first year had a chronic disease that prevented him from teaching. This meant that the Academy had no lessons of Physics, and had to have two lecturers teaching two subjects each. The Board saw this as a temporary situation and asked the King to act. Also, as they saw it as their duty to propose appropriate means for the King to find a solution, which they considered urgent, they proposed a candidate for teaching in the Academy, and described his curriculum.

In a letter of December 20, 1816 we can see that some serious problems had also arisen between the board of teachers and the Military Board. Against the Academy's rules, a student was authorized to attend an examination by the Teacher's Congregation, and this was not communicated to the Military Board. The Military Board, on this pretext, asks the King to send "appropriate and effective orders to end once and for all the insubordination that is spreading in the Academy, in spite of the harsh measures taken to tackle it."[41] They ask for the Teachers' Board to be chaired by a member of the Military Board, as they see irregularities and friction in their meetings due to rivalries between members of the same profession. They also ask for the Military Board and the lecturers to be given some sort of military authority over the students.

[40] On Stockler see [Saraiva, 1993] and [Saraiva, 1997].

[41] "Dar previdencias opportunas e efficazes para comprimir de huma vez o espirito de insubordinação que vai grassando n'este Régio Estabelecimento, apezar das medidas de severidade empregadas para reprimir".

In a letter to the General Inspector dated 1817 (probably January or February), the Military Board reflects on the students' failure rate, and on the situation in the Academy. This document is in very bad condition, with several parts missing, so in places we had to decide the most probable text:

[…] only eighteen attended exams and passed, all the others stopped attending classes because […] and by the belief in the military that studies are useless for their success. It is our duty to inform your Excellency that such neglect in which the Royal Academy has fallen demands the most effective measures, in order to obtain the great benefits that the King mentions[…][42]

The disciplinary situation in the Academy seems to be in an almost desperate state, as in a letter of November 20, 1818, and using the pretext of disciplinary action against two students, the Board asks that not only the Military Board but also the Academy's teachers be authorized to punish certain acts with no further delay, without the need for written reports. In this letter it is stated that the changes in the Academy's rules concerning discipline, which were requested at the end of 1816, remain unimplemented two years later.

Finally, the Military Board's letter of March 21, 1820 to Thomaz António Villanova Portugal (1755-1839), then General Inspector, is the last document seen in the Rio de Janeiro National Archive with Stockler's signature on it. It is a very pessimistic view of the future of the Academy. It begins:

The Military Board of the Royal Military Academy, without the authority and the means to prevent the continuation of the serious […] turmoil which cause enormous damage to the Service of His Magesty and to teaching the youth[43]

The Board sees as one of the main causes for this unhealthy state of affairs the fact that some of the students constantly fail their examinations, and begin to think that the fact that they are in the Academy for more years than would be normal to complete the Academy course gives them rights over the younger students, who they antagonize, disrupting the normal functioning of the Academy.

7. Concluding Remarks

The shortcomings in the way the Royal Military Academy functioned should not detract from its immense merits. It tried to bring European mathematics to Brazil, and in such a way that the Academy's students, after finishing the course, could be useful to their country

[42] "Somente fizerão exame, e fo[ram apro]vados dezoito, tendo todos os demais deixado de fr[equen]tar por motivos [...] e pe[la per]suação em que se achão os Militares, da inuti[lida]de dos estudos para os seus sucessos. He do no[sso de]ver representar a V. Exª., que hum semelhan[te aban]dono, em que se acha a academia Real, [exi]ge as mais efficazes providencias, afim de [se po]derem obter as grandes vantagens a que se [refere] El-Rei[...]"

[43] "A Junta da Direcção da Academia Real Militar destituida de autoridade e meios de cohibir a continuação das graves [...] desordens, que com gravissimo prejuizo do serviço de Sua Magestade e da instrução da mocidade"

using what they had learned there. It was organized in a way that also tried to promote research, by the lecturers as well as by the students, with its *partidos* and awards. It marks the beginning of higher level mathematics courses in Brazil, an achievement that was accompanied by the enormous task of translating textbooks by some of the best-known European mathematicians and textbook writers, among them Euler, Lacroix, Legendre, Francoeur, and Lacaille. The Academy provided the basis for the future development of mathematics in Brazil.

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