Revista Brasileira de História da Matemática - Vol. 11 nº 21 (abril/2011 - setembro/2011) - pág. 77-106
Publicação Oficial da Sociedade Brasileira de História da Matemática
ISSN 1519-955X

MANOEL FERREIRA DE ARAUJO GUIMARÃES (1777-1838): FROM THE NAVY ROYAL ACADEMY TO THE ROYAL MILITARY ACADEMY OF RIO DE JANEIRO

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(aceito para publicação em dezembro de 2010)

In memory of
Luizélio Furtado Saraiva
and
Jandira Dalben Nobre

Abstract

The aim of this paper is to give an account of the life and work of Manoel Ferreira de Araujo Guimarães up to the eve of Brazil's independence in 1821, the year of his retirement from the Royal Military Academy. We start with his studies in the Navy Royal Academy and then we analyze in particular detail his work both in the Royal Academy of Ensigns, first in Lisbon and later in Rio de Janeiro, and in the Royal Military Academy of Rio de Janeiro. His work as editor of *A Gazeta do Rio de Janeiro* (The Rio de Janeiro Gazette) and in *O Patriota* (The Patriot) and *O Espelho* (The Mirror), the latter two journals founded by Guimarães, will also be contextualized.

Keywords: Araujo Guimarães, Portuguese mathematics, 19th century, Royal Academy of Ensigns, Royal Military Academy of Rio de Janeiro, Brazil.

Resumo

Neste artigo pretende-se dar uma perspectiva sobre a vida e obra de Manoel Ferreira de Araujo Guimarães até às vésperas da independência do Brasil em 1821, o ano da sua reforma da Academia Real Militar. Começamos por descrever o seu trajecto enquanto estudante na Academia Real de Marinha, e depois desenvolvemos em mais detalhe a análise da sua passagem na Academia Real dos Guardas-Marinhas, primeiro em Lisboa e depois no Rio de Janeiro, bem como a sua actividade na Real Academia Militar do Rio de Janeiro. O seu trabalho como editor da *Gazeta do Rio de Janeiro* e nos jornais *O Patriota* e *O Espelho* (ambos por si fundados) será também contextualizado.

Palavras-chave: Araujo Guimarães, Matemática Portuguesa, século XIX, Academia Real dos Guardas-Marinhas, Real Academia Militar do Rio de Janeiro, Brasil.

1. The Naval Academies[1]

Up to the middle of the 18th century the Portuguese naval officer corps was not a homogeneous group. Very different skill levels were found, from officers with considerable military ability but little knowledge of navigation to some who mastered navigation techniques but with no military expertise. This heterogeneity was mainly due to the different forms of conscription: in the Navy one could find nobles, skilled sailors and pilots of the navy, Army officers, and merchant navy officers.

To improve this situation, by a decree of July 2, 1761, the Marquis of Pombal created the ensigns' class. To be admitted to this class it was necessary to be a young noble or the son of a general or of a higher-ranking officer. However no school was founded; the Marquis' idea was that the class should function like the British Royal Navy, the ensigns should learn their trade on board ship. The candidates were chosen by the ship's captain and had an intensive two-year training during the ship's voyages. But things did not turn out as expected, and the ensigns' class was ended in 1774, 13 years after its creation.

In 1779 the *Academia Real de Marinha* (*Navy Royal Academy*) was founded in Lisbon. It included a three-year mathematics course, which was less comprehensive than the four-year course taught at Coimbra University.

The mathematics subjects taught in the Academy were as shown in table 1:

First Year	Arithmetic. Geometry. Plane trigonometry. Algebra up to second degree equations
Second Year	Algebraic applications to Geometry. Infinitesimal and Integral Calculus. Principles of Statics, Dynamics, Hydrostatics, Hydraulics and Optics.
Third Year	Spherical Trigonometry Theoretical and Practical Navigation

Table 1- Mathematics in the Navy Royal Academy

Those who wanted to study military engineering attended the first two years at the Navy Royal Academy and then completed their instruction in special schools, where they followed fortification, drawing and engineering courses. Those who wished to enlist in the merchant navy attended the first and third years of the Academy's course. Those who wanted a career in the Royal Navy had to complete the three-year course. Among these, those who wished to become pilots or aimed at a career post higher than lieutenant had to have a two-year period aboard a ship.

The Navy Royal Academy students were civilians; they did not have the military expertise required for service in the Royal Navy.

To fill this gap, the Company of Naval Ensigns (*Companhia dos Guardas-Marinhas*) was founded in Lisbon in 1782. Again, as in the former class of Ensigns, access was restricted. Only nobles, or sons of military men who graduated as at least captain-

[1] For a more detailed account of the history of the Naval Academies see (DE MORAIS, 1945).

lieutenant (*capitão-tenente*) in the navy, or as sergeant-major (*sargento-mor*) in the army, or students of the Navy Royal Academy who had been awarded Academy prizes could be admitted to the Company. The candidates had to be between 14 and 18 years old at the time of admission, although this was not always enforced. The practical and military teaching was given at the academy's headquarters, in Lisbon's Naval Arsenal.

The statutes of the Royal Academy of Ensigns were published by a decree of April 1, 1796. They summarized the experience gained from 14 years of practice, and as a consequence the statutes were stable over the next few decades, as they remained in force until 1858[2].

The statutes create a three-year mathematics course, as can be seen in table 2:

First Year	Arithmetic. Geometry. Plane Trigonometry and its use at sea.
Second Year	Principles of Algebra, up to second order equations. Its applications to arithmetic and to geometry. Conic sections and mechanics, with applications to ship's equipment and maneuvers.
Third Year	Spherical Trigonometry. Theoretical and Practical Navigation. Principles of Naval Tactics

Table 2 - Mathematics course at the Royal Academy of Ensigns

At the same time the students followed a practical course, whose subjects can be seen in table 3:

First Year	All matters related to the ship's equipment: Masts, cables, casters, sails, etc; their diversity and use.
Second Year	Naval draughtsmanship (plans, ships); shipyard construction
Third Year	Half of the classes were on practical matters, including draughtsmanship, the other half on theoretical and practical gunnery.

Table 3 - The Royal Academy of Ensigns Practical Course[3]

Three hours of classes took place daily, in the mornings. Mathematics was taught for the first hour and a half, then a 15-minute interval followed, and the morning ended with a second 90-minute lesson. The intention of keeping the afternoons free of lessons was to encourage students to use them to study the material taught in the mornings.

The academic year started in October and finished at the end of June. Examinations took place during July, the subjects were picked at random 24 hours before the examination. The students were to be examined by three teachers, the session being

[2] This concerns the branch of the Royal Academy of Ensigns that remained in Brazil after its independence.

[3] In fact the course lasted four years, as after the first year the students had what was called "The year on board" [*Ano de embarque*] spent aboard a ship, returning to the Academy course the year after. In 1802/1803 Guimarães was one of the Academy's teachers aboard one of these ships.

chaired by the teacher whose subjects were being examined. Any student who failed twice in the same subject was expelled from the school.

The holiday periods were Christmas, Easter, August and September. Also there were no classes on the Thursday of every week that did not include any holiday. During term time, every Saturday there was to be a debate among students on the material learned during the week, with nine students chosen at random for the debate, three as defendants, and six as examiners (*arguentes*). This debate was attended by the teachers.

The Academy's first statutes (COLLECÇÃO, 1828, p. 270), on the chapter "Teachers and [their] substitutes", stated[4]:

> *"I. The corps of the Academy will consist of three teachers of Mathematics, two substitute teachers, one Gunnery teacher, two experts, one on the ship's equipment and the other on Practical Shipbuilding and Drawing* […]
> *V. The appointed substitute teachers will be those who either obtained the required degrees at the University of Coimbra or were successful in the General Exam of the Mathematics Course at the Navy Royal Academy, or those that from now onwards will complete the Royal Academy of Ensigns course, having shown beyond a shadow of doubt that they are able to fulfill such an important job.*
> *VI. The substitute teachers will be promoted to full teachers depending on their seniority as substitute teachers.*
> *VII. Teachers and their substitutes at the Royal Academy of Ensigns will have all the privileges, liberties and exemptions of the Coimbra University teachers* […]*"*[5].

The Navy Royal Observatory was founded in 1798 (decree of March 15). The students of both naval academies were to have some of their practical lessons there. On its history see (ESTÁCIO, 2009).

In 1800 José Maria Dantas Pereira (1772-1836)[6], a teacher at the Royal Academy of Ensigns, became commander of the Ensigns Corps.

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[4] In what follows, all quotes in Portuguese will be given in their English translation, with the Portuguese text included in footnotes.

[5] *"I. O Corpo da Academia será composto de três lentes de Mathemática, dois seus substittutos, hum Lente de Artilharia, e dois Mestres, hum de Aparelho, e outro de Construção Naval Prática e Desenho* […] *V. Para Substittutos serão admitidos os que tiverem obtido os precisos graus na Universidade de Coimbra, ou feito o exame geral do Curso Mathematico na Real Academia de Marinha; ou os que daqui em diante sahirem da Real Academia dos Guardas da Marinha, tendo dado provas nada equivocas da sua aptidão para esta importante profissão. VI. Os substittutos serão promovidos a lentes, conforme as suas Antiguidades na Substituição. VII. Os Lentes, e Substittutos da Real Academia dos Guardas da Marinha, gozarão de todos os privilégios, Indultos e Franquezas, que gozão os Lentes da Universidade de Coimbra.* […]*"*

[6] He joined the Royal Navy in 1786, and was promoted to First Lieutenant in 1789. He was successively promoted, and was Fleet Commander when he left the Company, in 1817. He was an academician, and published two mathematics papers in the first series of the Memoirs of the Academy of Sciences of Lisbon. For further information on Dantas Pereira see (DA SILVA, 1858-1870; Volume V, pp. 29-33). See also (GUEDES, 1974).

The library of the Royal Academy of Ensigns was created in 1802. It had a significant scientific component, with many important mathematics works[7].

Dantas Pereira was appointed Director of the Royal Academy of Ensigns in 1807, so from that date onwards he headed over both the Company and the Academy.

Following the French invasion of 1807, the Company and its library were transferred to Brazil, where they arrived on January 18, 1808, just four days before the Prince Regent and future King D. João VI and his court. The Academy settled in the Monastery of S. Bento in May and classes resumed soon afterwards. With the arrival of the Court in Brazil, Rio de Janeiro became the capital of Portugal until 1821, and this led to many important changes, among them the foundation of a National Press (Decree of May 13, 1808), which until then had been forbidden[8]. Dantas Pereira saw in these changes an opportunity to propose the creation of a journal written by the Academy's teachers that would publicize the best processes and inventions concerning crafts and sciences. At the same time he proposed to extend the mathematics course of the Academy from three to four years, such that it could be considered the equivalent of the courses of the two Naval Academies in Lisbon and of the Faculty of Mathematics of Coimbra University. These proposals are included in a document he called *Apontamentos - Concernentes á regulação de huma nova Academia e da Companhia dos Guardas Marinhas* ("Notes concerning the regulation of a new Academy and of the Company of Ensigns") (ACM[9], Companhia dos Guardas-Marinhas, cx. 117, 09/06/1808).

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[7] We know its detailed contents from the inventory of all its contents taken by the Royal Academy of Ensigns to Brazil, reproduced in (ALBUQUERQUE, 1982; pp. 149-170). The majority of the books are in French, even those by non-French authors. There are also some Portuguese translations. We give a list of a significant part of its mathematical items, stating their titles as they are written in the Catalogue. D'Alembert (*Opuscules Mathematiques, Recherches sur differens points du sisteme du Monde, Traite de l'Equilibre et movement des fluides*), Lacroix (*Elemens de Geometrie*, *Traite Trigonometrique*), Lalande (*Astronomie*), Laplace (*Mecanique Celeste*), MacLaurin (*Traite d'Algebre, Abregé du Calcul Integral*), Belidor (*Architecture Hidraulique*, *Nouveau Cours de Mathematique*), Euler (*Introduction a l'Analise Infinitesimale*, *Elemens d'Algebra* [sic]), Hospital (*Analise des Infiniments Petits*, *Traite Analitique des Sections Coniques*), Monge (*Geometrie Descriptive*), Clairaut (*Theorie de la Lune*, *Elemens d'Algebre*), Condorcet (*Essais sur la Aplication de l'Analyse a la Probabilité des Decisions*), Franchini (*Memoires sur l'Integration*), Lagrange (*Mechanique Analytique*), Carnot (*Principes Fondamentaux de l'Equilibre et du Mouvement*), Legendre (*Elemens de Geometrie*), Newton (*Principia* et *Opuscula*), Lacaille (*Leçons elementaires de Mathematiques par Marie*, *Leçons elementaires de Mecanique, Leçons elementaires d'Astronomie*), Bezout (*Theorie Generale des Equations*, and several translations in Portuguese : Spherical Trigonometry, Plane Trigonometry, Course of Mathematics-of which there were by far the most copies in the library : 22-, Algebra and Calculus, Geometry, Mechanics), Bossut (*Cours de Mathématiques*, *Traite Elementaire de Calcul*, *Traité Elementaire de Mecanique*, a book on Hydrodynamics in Portuguese translation), Marie (*Treatise on Mechanics*, in Portuguese), and Euclid (a 1516 Paris edition of an unnamed work, without doubt his *Elements*). It is interesting to note that all the textbooks recommended for the Mathematics course in the Portuguese University reform of 1772 are here: Euclid, Bézout, Bossut, Marie and Lacaille. All except Euclid and Lacaille are in their Portuguese translations (the only book used as a textbook in Coimbra which we do not know if it was translated into Portuguese is Lacaille's *Leçons Elementaires d'Astronomie*). In this list also appears Guimarães' translation of Lacaille's Course of Mathematics (LACAILLE, 1800), referred to as a translation of Abbot Marie's text.

[8] On Brazil before 1808 and the changes that resulted from the transfer of the court to Rio de Janeiro, see (SARAIVA, 2007), especially pp. 23-25. For a text in Portuguese, see also (DE OLIVEIRA, 2005), especially pp. 80-100.

[9] ACM stands for *Arquivo Central da Marinha*, the Navy´s Central Archive in Lisbon.

These were really very interesting proposals, but none went ahead: most probably at the time Dantas Pereira proposed a reform of the mathematics course at the Ensigns Academy there was already the intention of going ahead with the foundation of the Royal Military Academy of Rio de Janeiro, and concerning the creation of the journal Pereira proposed, this was later put into practice with the one founded by Araujo Guimarães in 1813, *O Patriota* (The Patriot).

The Royal Military Academy of Rio de Janeiro was created by a Decree of December 12, 1810. This is a 13-page document (COLLECÇÃO, 1826; pp. 935-948) describing in detail all matters connected to the Academy. The intention of its foundation is clear: to have a higher studies institution not only to prepare officers to be able to master the technicalities of new weapons and military processes and techniques, but that also to prepare the cadres that would be in charge of the administrative state apparatus. The course had a duration of seven years, the first four of which consisted of a mathematics course, and the last three were a military course. For a detailed analysis of the Academy's course, its teachers and students in its first ten years, see (SARAIVA, 2007).

Here we only mention the contents of the mathematics course, which in its essential part maintained the structure of Pombal's 1772 reform of Coimbra University, the main difference being the textbooks used:

First Year	Arithmetic; Algebra up to 3rd and 4th degree equations. Geometry. Trigonometry.
Second Year	Revision of concepts of calculus learned in the first year. Methods of solving equations. Applications of Algebra to line and geometry of curves (degree 2 and higher). Differential and Integral Calculus. Applications to Physics, Astronomy and Probability.
Third Year	Principles of Mechanics (Statics and Dynamics) Principles of Hydrodynamics (Hydrostatics and Hydraulics) Ballistics theory
Fourth Year	Spherical Trigonometry; Optics, Catoptrics and Dioptrics System of the World (Celestial Mechanics) and its applications, including Geodesy. Geographical maps and projection techniques.

Table 4: Mathematics course of the Royal Military Academy of Rio de Janeiro

2. The early years of Manoel Ferreira de Araujo Guimarães, from Bahia to Lisbon (1777-1805)

Guimarães was born on March 5, 1777 in Bahia. In 1784 he started at the school of Father José Lopes, said to be the finest in Bahia. In 1788 he studied Latin with Father Pedro António Netto Cavalcanti, and at the end of the academic year he was awarded a prize. He left Bahia for Lisbon on July 12, 1791, arriving in Europe on September 9. As he had forgotten to bring his Latin diploma, which he needed to continue his studies, he requested

an examination, but this was not authorized. He therefore had to start a second Latin course (on October 4), taught by Manoel Rodrigues Maia. By the following July he had completed it, obtaining a pass with distinction after a public examination procedure. In October 1792 he began studying Greek, and in 1793 he started Rhetoric classes, impressing his teacher, Francisco de Salles. In 1794 and 1795 he took classes in Philosophy, French, English and Italian[10].

It was in 1795 that Guimarães met Luciana Ignácia Perpétua, who became his wife on January 30, 1796, when Guimarães was still only 18 years old. It was a marriage which would last 36 years, until her death, in 1832. They had six children.

With hindsight we can see in this period some of the features that shaped Guimarães'life being defined. His early education had a strong influence on his view of life. The classical writers would always be a reference for him: we can see in his texts quotations from Horace, Cicero, Ovid, and others. His excellent preparation in languages makes more understandable his important role later in his life in the translation of mathematics works. Also the fact that he had a large family in some ways conditioned his life, so that he always had difficulty in making ends meet[11].

For lack of money Guimarães could not study at Coimbra University, and on October 1, 1798, he enrolled at the Navy Royal Academy. In an unusual move, only four months after he started the Academy's course, on February 2, 1799, he presented to the Navy Minister, D. Rodrigo de Souza Coutinho, Count of Linhares, a Portuguese translation of the first two chapters (on Arithmetic and Algebra) of Lacaille's *A Basic and Complete Mathematics Course*, in an edition with additions by Marie. The translation was sent to the Academy of Sciences, which produced a highly positive report. This must have caused quite a stir in the Academy, so that it was no surprise that on April 22 the Admiralty Board decided to award him one of the Academy's prizes for that year [ACM, Caixa Lentes]. Francisco de Borja Garção Stockler[12] (1759-1829), then a second-year teacher of the Navy Royal Academy, was so impressed that he asked to be given the subject on which Guimarães was to be examined so he could conduct the examination, even though this was the function of the first-year teacher, as each teacher in principle conducted the examination on his own subject.

Later in the distribution of Academy prizes for the year 1798/99, Guimarães was given a prize of 72,000 *reis.* On September 3, 1799, the Academy, aware of Guimarães' financial problems determined that until he left the Academy, he would receive a yearly pension of 50,000 *reis.*

By a decree of March 22, 1800, he was appointed *aspirante piloto*. Two of his translations were published in Lisbon, by the printer João Procópio Correa da Silva: Lacaille's *Curso Elementar e Completo de Mathematicas – Puras, augmentado por Marie*

[10] Concerning Guimarães's biography, our main reference is (DAMÁSIO, 1844). We also use (DA SILVA, 1858-1870; Volume V, pp. 424-425), and (DA SILVA, 1858-1870, Volume XVI, pp. 209-210). Concerning this last reference, we should point out that da Silva mistakes the Royal Academy of Ensigns for the Navy Royal Academy.

[11] This was one of the reasons for some of his petitions, arguing in one of his letters that he even did not have the money to buy new shoes [ACM, Lentes (Manoel Araujo Guimarães), Cx 5].

[12] On Stockler see (SARAIVA, 1993), especially pp. 417-419.

e illustrado por Theveneau (*Basic and Complete Course of Pure Mathematics, with additions by Marie, and illustrated by Theveneau*), (LACAILLE, 1800) and *Explicação da formação e uso das táboas logarithmicas e trigonometricas* (*Explanation of the construction and use of trigonometric and logarithmic tables*) by Marie (MARIE, 1800). He completed his course in 1801 and was awarded the corresponding diploma (May 23). He began work at the Navy Royal Observatory. But less than a month after receiving his diploma he was appointed substitute teacher at the Royal Academy of Ensigns (June 19). He was then second lieutenant.

Whenever there were teachers to be appointed to the Navy Academies, a document was produced for each candidate outlining the reasons he had been nominated. In the case of Guimarães, this proposal was signed by Manoel Jacinto Nogueira da Gama[13] (1765-1847), a teacher in the Academy in the period 1791-1801. It was da Gama who wrote the first translation of Lagrange's *Théorie des Fonctions Analytiques*, which was published in Lisbon in 1798, only one year after it was published in France.
It is worth quoting what he wrote on Guimarães (ACM, Academia Real de Marinha, Colectivos, 19/06/1801):

> *"He completed the Navy Royal Academy course constantly meriting special attention, and having been awarded prizes every year. He was awarded a special prize by His Royal Highness, a yearly pension of 50,000 reis. He is working in the Navy Royal Observatory. When he was a first-year student he translated the Mathematical Elements of the Abbot Marie, which your Royal Highness ordered to be printed and published; he translated Euler's Elements of Algebra, which is now being printed; and he has already translated much of Cousin's Calculus, a work he is doing by appointment of your Royal Highness; he is very active and industrious. He also shows a commendable temper. The fact that he is not a University of Coimbra mathematics graduate should not exclude him from being a teacher at the Academy, as it has not excluded José Maria Dantas Pereira, Capitão de Mar e Guerra, Commander of the Ensigns Company, and Euzébio Dias Azedo, Engineer Sergeant Major"*[14].

[13] On Nogueira da Gama see (DA SILVA, 1858-1870; Volume VI pp. 7-8) and (DA SILVA, 1858-1870, Volume XVI, p. 227). He was born in S. João del Rey, Minas Gerais, Brazil, and died in Rio de Janeiro. He graduated in Mathematics and Philosophy at Coimbra University. A professional soldier, he reached the post of marshall. He was also a politician, holding several positions. After Brazil's independence, he was a senator for Minas Gerais. He also translated Lazare Carnot's *Reflexions sur la Methaphysique du Calcul Infinitésimal*, published in 1798 in Lisbon by João Procopio Correa da Silva, one year after its publication in France.

[14] *"Completou o curso de Mathematica da Academia Real da Marinha, merecendo constantemente particular contemplação, e tendo obtido prémios todos os annos, e athe hum premio extraordinário que V. Alteza lhe mandou dar, huma pensão anual de 50,000 reis: acha-se empregado no Observatório Real da Marinha. Traduzio, sendo discípulo do primeiro anno, os Elementos de Mathematica do Abade Maria, que V. Alteza mandou imprimir e publicar; traduzio os Elementos de Álgebra de Euler, que se estão actualmente a imprimir: e vai já adiantada a tradução do Calculo de Cousin de que foi encarregado por ordem de V. Alteza Real: tem muita actividade e desembaraço em trabalhar: mostra hum génio recomendável. À falta de formatura em Mathematica feita na Universidade de Coimbra não deve excluir de ser Professor na Academia, como não excluio a José Maria Dantas Pereira, Capitão de Mar e Guerra, Comandante da Companhia dos Guardas-Marinhas, e a Euzébio Dias Azedo, Sargento Mor de Engenharia"*.

The Euler book mentioned in this quote was published in Brazil in 1809, seven years after Cousin's translation became available[15].

3. The first translations

Guimarães chose to have a quotation from Virgil on the cover of his first translation, Lacaille's *Elementar and Complete Course of Pure Mathematics*. The quotation is *"Audacibus adnue coeptis"*, that is, "favour this audacious project of mine". This certainly alluded to the uniqueness of having a translation of a well-known mathematician published by a student at the Navy Royal Academy at the turn of the 19th century. In its preface Guimarães mentions that his work as a student at the Navy Royal Academy made it more difficult for him to find the time to complete his translation[16]. Here we learn more about Guimarães, about his ideas on the characteristics of a good basic book of mathematics, and on his own knowledge of mathematics. He states (quoting d'Alembert): "a good elementary book is one which leaves much for you to think about"[17], suggesting that if a mathematics book is of good quality then it will inspire the reader to practise mathematics. And this is why he decides to cut some of Theveneau's notes from the Portuguese translation which, in his opinion, "are calculations whose only difficulty is their length", and therefore their inclusion is not worth delaying the publication of Guimarães's translation[18], implying that the reader is already in a position to make the computations which he has just edited out of the book. Guimarães also states that his work could not be a straight translation, in fact he had to correct many mistakes, double-check calculations, and compare the different editions of the book; and he states that he considers his edition the most mathematically correct[19]. His confidence in his mathematical ability is obvious.

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[15] In a letter dated April 2, 1812, transcribed in the Appendix, Guimarães enumerates his translations and does not include Euler's. *Elementos de Algebra*., which is odd, as he even mentions an unpublished translation of his. In fact he says that almost all first year textbooks were already translated when courses began, and so the first year teacher of the Royal Military Academy of Rio de Janeiro only had to translate "the first volume of Euler's Algebra". *Elementos de Algebra* was published in 1809, more than a year before classes started at the Royal Military Academy of Rio de Janeiro, so clearly this is not the work mentioned by Guimarães. António José do Amaral (1782-1840) was the first year teacher of the Royal Academy in 1811, but so far there is no indication that he translated any textbook.

[16] In the Preface, Guimarães also alludes to people who criticized his translation, even before it was published. We can assume that this was because a mere student had the audacity to translate a well-known mathematics textbook. To these people Guimarães answers with a quote from Cicero's *De natura deodorum* (On the nature of the gods), book II, 29, 73: *Vestra amatis, coeteros, causâ incognitâ, condemnatis* (LACAILLE, 1800; Preface), that is, *"you have affection for your own things, but you despise everything else, without even hearing their cases"*.

[17] *"o carácter de hum bom livro elementar he deixar muito que pensar"* (LACAILLE, 1800; Preface)

[18] *"Cortei algumas notas de Theveneau, que sendo cálculos, que não tem mais dificuldade que a extensão, não mereciam que por elles se atrazasse* […] *a publicação desta traducção, há tanto tempo e tão anciosamente esperada"* [*Idem*].

[19] *"*[*fazer esta tradução*] *foi de tanto mais penoso por usar de uma edição que* […] *ajuntava muitos erros, cujas emendas não me custaram pequeno trabalho, já em conferir edições* […] *já em fazer cálculos fastidiosos e longos. Quanto à edição* […] *penso ter conseguido ser a mais correcta de quantas até ao presente tem apparecido, sem exceptuar mesmo a de 1799*[…]*"* [*Idem*].

The book has six chapters. The first four are Principles of Arithmetic, Principles of Algebra (including proportions, arithmetic and geometric sequences, series, logarithms, 3rd, 4th and higher degree equations, and methods to compute approximations of the roots of a number), Principles of Geometry (including similarity and equality of triangles, surfaces, solid figures, applications of geometry and algebra to trigonometry, approximation methods for squaring the circle, calculus of spherical triangles and spherical trigonometry applications), and Analytic treatise of conic sections (including the study of the ellipse, parabola and hyperbole, and the squaring of conic sections). The last two chapters are on Differential calculus and Integral calculus (including the study of the method of computing the local maxima and minima of a function, its inflection points, application of differentiation to the theory of curves, integrating series, integrating differentials with logarithms, exponentials and trigonometric functions, squaring and rectification of curves, solids obtained by rotations, and differential equations)[20].

The same year his translation of Marie's *Explanation of the Construction and Use of Logarithmic and Trigonometric Tables* (61 pages) (MARIE, 1800) was published. In its preface Guimarães mentions that he decided to translate this small book while he was translating Lacaille's *Pure Mathematics Course*, in which he saw Marie's book mentioned. For him this was an opportunity to be useful to his fellow citizens, as he knew that it was difficult for students to get hold of trigonometric and logarithmic tables, and even those that they could find were either written in an unfamiliar language or had no explanation for use.

In his first year as a teacher of the Royal Academy of Ensigns he translated Jacques-Antoine-Joseph Cousin's *Tratado Elementar de Analyse Matemática* (*Elementary Treatise of Mathematical Analysis*) (COUSIN, 1802) a 206 page-book. In his preface to this work his confidence in his abilities is obvious, a world away from his timidity shown only two years earlier when presenting his first translation. He knows he has the King's trust in his abilities, and he has won prizes and praise for his work, culminating in his appointment as teacher at the Royal Academy of Ensigns, only a month after completing his course at the Navy Royal Academy[21].

4. At the Royal Academy of Ensigns

In the years 1801/02 and 1802/03 he taught the chair of the second mathematical year. From July 1802 to March 1803 he accompanied the Ensigns battalion in its eight-

[20] It is curious to point out that another translation of Lacaille's work, by Frei Bento de S. José, appeared in 1801 in Coimbra, published by the Royal University of Coimbra Press, to be taught in the Colleges of the S. Bento Congregation. On examination of its index we can safely say that it covers the same subjects as Guimarães' translation. It is interesting that in the Preface the translator says that he does not agree with the additions made by Theveneau to Marie's 1784 edition, saying that they are not suitable for a beginner's textbook.

[21] *"Se outra vez, repassado do justo receio que me inspirava o próprio conhecimento, cheguei ante o Throno de V.A.R. a offerecer hum pequeno fructo da minha applicação, hoje venho, justamente animado, dar conta da tarefa, que em seu Real Nome me foi incumbida* […] *A fortuna de ser lembrado para co-operar à illustração de meus Compatriotas, em que V.A.R. tão seriamente se empenha* […] *do muito que V.A.R. se tem dignado contemplar-me, distinguindo-me desde o berço de meus conhecimentos Mathematicos, animando-me com prémios, e até com louvores* […]*".*

month sea voyage of theoretical and practical learning, including the study and practice of astronomy. The ship, the *Princesa da Beira*, made stops in Gibraltar and Cartagena, before returning to Lisbon. In the year 1803/04 Guimarães continued to teach the second year chair, and for two months he and the first-year teacher were also asked to teach the chair of the third mathematical year (Navigation) in alternate weeks, as its substitute teacher, José Joaquim Pereira, could not teach. He then submitted a proposal to be appointed first lieutenant [ACM, Lentes (Manoel Araujo Guimarães), cx. 5], basing his argument on the fact that he had done significant work for the Academy and had translated several books. He pointed out that many colleagues of his who, in his opinion, had served for less years in the Academy and produced less work, had already been appointed first-lieutenants or engineer captains.

However his submission was refused on August 14, 1804. Instrumental in this was the report by the Commander of the Company of Ensigns, José Maria Dantas Pereira, on August 7 [ACM, Lentes (Manoel Araujo Guimarães), Cx. 5, 07/08/1804] In it there is no explicit refusal to support Guimarães' submission, In fact in most of the document he praises Guimarães, reminding the reader of the prizes he had won while at the Navy Royal Academy and of the praises written in the same period by Stockler; he stated that in recognition for his mathematical abilities, the Navy Royal Academy had agreed to let him have an yearly sum of 50,000 *reis* until he completed the Academy's course. The only part of his report that could have had a definitive influence on the refusal was his report about the above-mentioned sea trip with the Ensigns battalion: he said that Guimarães did not present the required written reports about the trip, including the ship's log, the observations made, and the seaways travelled.

This decision was considered somewhat harsh on Guimarães, and his appointment in 1804 as an honorary lecturer (on December 17) appeared to be a consolation prize.

We know that life was not easy for Guimarães at the Ensigns Academy, as is seen in a letter of his about the refusal of the head of the Ensign's Academy Library to let him read the books he needed to prepare his course, although he was entitled to use the library as a teacher of the Academy (BIBLIOTECA, Manuscriptos).

So perhaps all this made it easy for him to decide to accept the Count of Ponte's invitation to accompany him to Brazil. The Count had just been appointed Governor and Military Commander ("*capitão-geral*") of Bahia. Guimarães obtained leave from the Ensigns Academy for one year, and left with the Count on November 11, 1805, arriving in Bahia on December 13.

He stayed in Bahia for a little over two years. He wrote several times to the Royal Academy of Ensigns saying he was ill, and in this way giving a justification for his absence[22]. The arrival of the Prince Regent and future King D. João and his Court in Rio on January 22, 1808 led Guimarães to go to Rio, where he arrived on August 29. The Count of Linhares appointed him Captain of the Engineering Corps. In 1809 he returned to teaching in the Royal Academy of Ensigns (AM[23], 20472), where he taught first-year students,

[22] For instance, see "Mapa dos movimentos e actual estado dos Lentes e Mestres da Companhia de Guardas Marinhas, feita a 5 de Agosto de 1807" (ACM, Companhia dos Guardas-Marinhas, cx. 117, 05/08/1807), where Guimarães is said to have written from Bahia on August 6, 1806, saying he was ill.

[23] AM stands for *Arquivo da Marinha*, the Brazilian Navy Archive, in Rio de Janeiro.

preferring to use in his class many geometry proofs by Legendre instead of those by Bézout, which had been taught for many years in higher studies in Portugal[24]. In this year three of his translations were published, all in the *Impressão Régia* (Royal Press): A. M. Legendre's *Elementos de Geometria* (LEGENDRE, 1809a) (*Elements de Géométrie, avec des notes*, first published in Paris in 1794), the first mathematical book published by the Royal Press in Brazil, as Guimarães writes in his introductory 2-page text, a dedication of the book to King D. João VI; Euler's *Elementos d'Algebra* (EULER, 1809)[25] (possibly a translation of the first volume of *Vollständige Anleitung zur Algebra*, published first in its Russian translation in 1770), and Legendre's *Tratado de Trigonometria* (LEGENDRE, 1809b) (*Traité de Trigonométrie*, a treatise which was included in later editions of the *Elements de Géométrie* at the end of the book).

We can see how Guimarães views his role as a translator from the introductions to the two Legendre books[26].

For the geometry book, he writes a 6-page *Prologo do Tradutor* (Translator's Prologue) with two aims: to give a summary of the book's contents, which had been in a Prologue by the author in previous editions but which had been omitted in the one that Guimarães translated (fifth edition, from 1804); and to state his approach to the process of translating.

On the former, after giving a short summary of the book's eight chapters, he mentions that Legendre also speaks of the existing notes to the main text as notes which are to be read only by those who want more than an elementary course in geometry, and that can be skipped in a first reading.[27] He also mentions that he had to add text to the part on trigonometry (thereby confirming that his two translations in fact derive from a single book by Legendre), but that the details would be explained in the introduction to that book.

On the latter, he criticizes those who underestimate the work of translators and think that it presents no difficulties.

On the duties of the translator, he says that his viewpoint is the one defined by Nicolas Beauzée in the article *Translation* in D'Alembert and Diderot's *Encyclopédie* (Encyclopédie, 1751-1772; T. XVI, pp. 510/511). Guimarães does not develop his thoughts on this subject any further. But from Beauzée's article we can clearly see his standpoint:

> *"La traduction est plus occupée du fond des pensées, plus attentive à les présenter sous la forme qui peut leur convenir dans la langue nouvelle, & plus assujettie dans ses expressions aux tours et idiotismes de cette*

[24] In the above-mentioned letter dated April 2, 1812 (footnote 15), Guimarães says that he had translated Lacroix's *Elements de Géométrie*, but this remained unpublished because of the publication of his own translation of Legendre's *Géométrie* (Biblioteca, Manuscriptos).

[25] See note 15.

[26] There is no introductory text in the Euler book (EULER, 1809).

[27] In some editions of Legendre's book it is written explicitly in the introductory *Avertissement* that on a first reading of the *Elements* the reader can omit all notes, appendices and generally all that is in smaller print, said to contain more advanced mathematics, thereby following a tradition from the textbooks of Etienne Bézout. There is no use of this device in the Portuguese translation either of this or of the *Traité de Trigonométrie*. This is similar to the way that Bézout's works were translated into Portuguese, which also neglected the use of different print sizes to indicate the different scientific levels of the text.

> *langue.* […] *La traduction ajoûte* […] *le tour propre du génie de la langue dans laquelle elle prétend s'expliquer* […] *mais elle doit la rendre cette pensée, comme on la rendroit dans le second idiome, si on l'avoit conçue, sans la puiser dans une langue étrangère. Il ne faut rien retrancher, il n'y faut rien ajoûter, il n'y faut rien changer* […] *Le* traducteur *n'est maître de rien ; il est oblide suivre par-tout son auteur, & de se plier à toutes ses variations avec une souplesse infinie.* […] *Rien de plus difficile en effet, & rien de plus rare qu'une excellente* traduction […] *Un attachement trop scrupuleux à la lettre, détruit l'esprit* […] *trop de libérté détruit les traits caractéristiques de l'original, on en fait une copie infidele".*

We still lack documentation on this subject, but it seems that the uneasiness between Guimarães and Dantas Pereira that already existed when they were in Lisbon, and of which the above related episode in which Guimarães' application for promotion was refused (based on a report by Dantas Pereira) is an indication, was further exacerbated in Rio by the use of Legendre's book on geometry in the teaching in the Royal Academy of Ensigns, when the official book for this subject in Portuguese higher studies had for decades been Bézout's. Dantas Pereira was opposed to this and complained to the King. In September 1809 a royal letter arrived confirming Pereira's authority (AM, 20472), stating that the documents that ruled academic life in the Academy were those defining the functioning of the University of Coimbra and of the Navy Royal Observatory in Lisbon[28], thereby in fact excluding Legendre's book from the textbooks of the Academy. Furthermore, the use of the book in teaching in the Academy was considered a violation of the Academy's statutes, quoting paragraph II of the chapter on *Teachers and their substitutes*, which states that teachers can improve their courses only after confirmation by the King has been received, following submission of the proposed changes to the school's Inspector (COLLECÇÃO, 1828; p. 270).

In this 1809 preface we feel a tension that is a sure sign of some strong opposition or criticism either of the job of translating in general or of the specific translation Guimarães was publishing, and an important one, as it was the first to be published in Brazil, as mentioned above. In it he directly addresses those who doubt the quality of his work. He starts his prologue by mentioning that many *presumptuous* (his word) scholars feel contempt for the work of translation, a work which they will never experience themselves and consequently are unaware of its difficulty[29]. And at the end of the Prologue he again addresses this issue, saying that some shortcomings can be detected in his work, due not only to the little time he had to complete it but also to his lack of knowledge of the principles of translation, but any *intelligent* reader (again his choice of word) will bear his shortcomings in mind and will be grateful for his work, emphasizing that it is the first of its

[28] *"Hey por bem, e Me Praz Ordenar* […] *que com effeito lhe sirvão de Regimento os Estatutos, Alvarás, e mais Diplomas, ou Orde[n]s Regias, que determinão o procedimento do Reitor, e Vice-Reitor, da Universidade de Coimbra, e do Director do Observatorio Real da Marinha na Cidade de Lisboa* […]".

[29] *"Sei que muitos presumidos Sabios olhão com desprezo para semelhantes trabalhos, a que nunca se dedicarão, e dos quaes por consequencia ignorão todo o pezo"* (LEGENDRE, 1809a; p. i).

kind to be published in Brazil. On his behalf he quotes Ovid, from *Epistulae ex Ponto* (III, 4, 79): *"although the strength is lacking, the will should be praised"*[30]. And he concludes defiantly: *"for the others* [that is, for *unintelligent* readers, certainly those who he addressed in the beginning of his text], *any apology is useless"*[31].

In the *Introducção do Tradutor* (Translator's Preface) in *Tratado de Trigonometria* there is no longer any discussion concerning the detractors of the work of the translator. Here he is solely concerned to explain his guidelines. He mentions that Legendre is using the new division of the quadrant adopted in France, a decimal system which kept the names *degree*, *minute* and *second*: the quadrant was divided into 100 equal parts, *degrees*, then each one of these parts was divided into 100 equal parts, *minutes*, and finally each minute was divided into 100 equal parts, *seconds*. Guimarães sees a difficulty for the Portuguese reader, not used to this new system. He mentions that he translated the text rigorously, as he believes that this is the duty of the translator, but between brackets he added for each measurement using the decimal system its corresponding measure in the sexagesimal system. He then discusses the advantages and disadvantages of both systems and shows how to convert the measurements of one system into the other, thereby giving the reader a way to check his own computations. He says that sometimes instead of using specific units he used the letter *q* to mean the quadrant, so the reader can convert the value given into the system he wants to use; that is, if he puts ½ q, this means 50 degrees in the decimal system and 45 degrees in the sexagesimal system. Finally he states that besides the exercises given by Legendre, he has added some of his own, concerning similar problems, and using not only the angle units but also the fathom (*braça* in Portuguese) as a unit of length, as it was the most commonly used unit in geodesic works in Portugal. All these new exercises, as well as his own remarks, are clearly indicated in the text by preceding them with a star. All this shows the responsible attitude of someone who knows that he must respect the author's original work but at the same time is aware of the knowledge of its potential readers. And he ends his *Introduction* with a quotation from Horace which he says expresses his viewpoint on translating and editing, and also shows his respect for the reader, to whom he feels answerable for the quality of the resulting translation [Legendre, 1809b; p. v]:

> *An omneis visuros peccata putem mea, tutus & intra spem veniae cautus?*
> *Vitavi denique culpam, non laudem merui"*.[32]

In 1810 he taught the Navigation class. He began to have health problems, probably due to a state of exhaustion, and asked for absence of leave to take place during

[30] *"Ut desint vires, tame nest laudanda voluntas"* (LEGENDRE, 1809a; p. vi)
[31] *"Para os outros he escusada qualquer desculpa"* (LEGENDRE, 1809a; p. vi)
[32] The full quotation, in its English translation, is as follows: *"It is not every judge that discerns unharmonious verses, and an undeserved indulgence is [in this case] granted to the Roman poets. But shall I on this account run riot and write licentiously? Or should not I rather suppose, that all the world is to see my faults; secure, and cautious [never to err] but with hope of being pardoned? Though, perhaps, I have merited no praise, I have escaped censure"*.

his holidays. In spite of this, and of the written support given to his proposal by the Navy's principal surgeon, his request was refused.

This made him see that he would never be at ease in the Navy Royal Academy. Therefore, the following year, he accepted the proposal of the Count of Linhares to become a teacher at the newly founded Academia Real Militar do Rio de Janeiro and submitted his application, which was accepted (Decree of February 28).

5. The Royal Military Academy of Rio de Janeiro

In this section we shall give a summary of Guimarães' work at the Royal Military Academy. In his first year at this institution, in 1811, Guimarães taught Astronomy, a subject he continued teaching until his retirement in 1821. On May 13 he graduated as Sergeant-Major[33]. On January 26, 1812 Guimarães suffered a significant setback, with the death of his friend and protector, the Count of Linhares, Rodrigo de Souza Coutinho. Their relationship dated back to 1799, when Guimarães presented Coutinho with the translation of the first two chapters of Lacaille's treatise. In memory of Coutinho he wrote the *Epicedio ao Illmo e Exmo Senhor D. Rodrigo de Souza Coutinho* (*Elegy to the most illustrious and most eminent D. Rodrigo de Souza Coutinho*). That year he also taught the second-year class at the Academy. In the same year his *Variação dos triângulos espherícos para uso da Academia Real Militar (Variation of the spherical triangles for the use of the Royal Military Academy)* was published by the Royal Press. It is said to be the first mathematics paper written by a Brazilian printed in Brazil (CAMARGO, 1993; p. xxiv). For a mathematical analysis of this paper see (DA SILVA, 1996).

The statutes of the Royal Military Academy stipulated that no teacher could be promoted or obtain any reward before structuring and writing his textbook according to the methods stated in the statutes, and having it approved by the Military Board (COLLECÇÃO, 1826, pp. 940-941).

Guimarães complied and wrote the textbook for the fourth year. In a extremely interesting 5-page letter dated April 2, 1812, he writes to Coutinho's successor as Minister of War in Brazil, D. João de Almeida (Melo e Castro) (Biblioteca, Secção de Manuscriptos).

Guimarães had lost a friend and a protector with the death of Coutinho, so this letter is probably an attempt to re-establish some kind of connection at the level of the Ministry of War[34].

It is very revealing how Guimarães sets out his choice of material and textbooks for the fourth-year subject. He uses as guidelines the Statutes of both the Royal Military

[33] A law issued on June 20, 1799, decreed that all graduated posts were only honorary, without any extra pay, so any soldier who had a graduated rank would receive the pay corresponding to his previous rank. See (DA COSTA, 1816; Volume I, T. II, pp. 141/142). I owe this information to General Silvino Curado. So we see that Guimarães'graduation did not improve his financial situation.

[34] In fact he begins his letter by alluding to his friendship with Coutinho (although not mentioning his name), who over the years had come to know his work and publications well. Almeida has no knowledge of this, so Guimarães will introduce himself and his work, and will also present his textbook for the fourth year.

Academy and the University of Coimbra. The former state in Section 2 *Number of teachers, sciences that they must teach, and their substitutes*[35], paragraph 4, concerning the fourth- year teacher (COLLECÇÃO, 1826, pp. 938-939):

> *"The fourth-year teacher will explain Le Gendre's Spherical Trigonometry in all its extent, and the principles of Optics, Catoptrics and Dioptrics; he will give an idea of all kinds of refracting and reflecting lenses, and then he will explain the system of the World; for this he will use many works by La Caille, and by la Land[r]e, and the celestial Mechanics of la Place* […] *and from this explaining all the methods for the computation of Latitudes and Longitudes at Sea and on Land* […] *showing the convenient applications to Geodesic measurements, which again he will teach in all its extent.* […]. *The works by la Place, by la Lande, by la Caille, and the introduction by la Croix, the Geography of Pinkerton, will be the basis for a Textbook, in which he should try to include in all its extent all the matters mentioned* […]*"*[36]

We can see that all the authors listed in the Statutes of the Royal Military Academy for the fourth-year subject are French (Legendre, Laplace, Lacroix, Lalande and Lacaille) except one (Pinkerton). In the Coimbra statutes there is a detailed description of the contents of each subject but there is no mention of specific textbooks except for Euclid's *Elements* and Proclus' *Commentary* (*on Book One of Euclid's Elements*) (ESTATUTOS, 1972; pp. 169-197)[37]. In Coimbra University the basic reference work for the fourth year was Lacaille's *Leçons Elémentaires d'Astronomie*.

But Guimarães gives more references, many of them not French. Following the order in which the contents of the fourth-year subject are described in the statutes, he starts by saying that two of the required textbooks either had been translated or were about to be translated, respectively his own translation of Legendre's *Spherical Trigonometry* and André Pinto Duarte's translation of Lacaille's *Optics.* He then builds his course around Biot's *Physical Astronomy* (Paris, 1805) and Vince's *Principles of Astronomy* (Cambridge, 1801), a textbook used at the University of Cambridge[38], adding results by Delambre and Laplace, Mackay's work on longitude (Aberdeen, 1801), principles of navigation from the works of Barquos, Bézout and Rios, Maskalyne's *Requisite Tables* (London, 1802), and

[35] *"Numero dos Professores, Sciencias, que devem ensinar, e dos seus substitutos"* (COLLECÇÃO, 1828; p. 937).

[36] *"O Lente do quarto anno explicará a Trigonometria Spherica de le Gendre em toda a sua extensão, e os principios de Optica, Catoptrica, e Dioptrica: dará noções de toda a qualidade de Oculos de refracção e de reflexão, depois passará a explicar o Systema do Mundo; para o que muito se servirá das Obras de la Caille, e de la Land[r]e; e da Mecanica Celeste de la Place* […] *e dahi explicando todos os methodos para as determinações das Latitudes, e Longitudes no Mar e na Terra* […] *mostrando as applicações co[n]venientes ás medidas Geodesicas, que novamente dará em toda a sua extensão.* […] *As Obras de la Place, de la Land[r]e, de la Caille, e a Introducção de la Croix, a Geographia de Pinkerton, servirão de base ao Compendio que deve formar, e no que hade procurar encher toda a estensão destas vistas* […]"

[37] Guimarães specifically quotes the part in the Coimbra statutes concerning the fourth-year subject, in Book 3, Part II, Section IV Chapter IV, pp. 189-195.

[38] Significantly he says that he will choose the more elementary parts from these two books.

Monteiro da Rocha's *Nautical Ephemerides.* On geodesic measurements he complains about having to teach this subject in its entirety, when it was already supposed to be taught in the first year, excepting only what depended on non-elementary notions of spherical trigonometry (LEGISLAÇÃO, 1826; pp. 937/938). He argues there is not enough time to teach all subjects in the depth required by the statutes. He says that he compiled a textbook on geodesy from the Memoirs included in the *Memorial Topographique et Militaire*, a journal recommended in the statutes, section 2, paragraph 5.[39] However it is still not complete at this stage, as he says that he did not finish his work as intended, and that part of the subject will be explained orally. He agrees with what is said in the Coimbra statutes about the ease and rapidity with which subjects depending on astronomy can be taught if one has a good understanding of astronomy[40]. Consequently, he mentions that everything concerning geography will be included in his astronomy textbook. He also hints that Wood's *Optics* (Cambridge 1802) is preferable to Lacaille's but does not specify why.

So from what Guimarães says we can see the work of someone who tried to be informed about new mathematics books, and who has an opinion about them; someone who wants to follow the statutes but who is aware of the low level of his students[41]. He tries to combine the learning in the European universities and cultural centres he knows, among them Coimbra, Paris and Cambridge universities. Of the six authors mentioned in the statutes, Guimarães does not explicitly mention two of them, Lalande and Pinkerton, in his choice of books, and adds ten more, seven of them not French, including the Portuguese Monteiro da Rocha. As further evidence of his independence of judgement, and as pointed out above, he also says that in his opinion Wood's *Optics* is a better book than Lacaille's on the same subject, although only the latter is mentioned in the statutes.

In the final part of his letter Guimarães gives a summary of the last eleven years since he entered the Royal Academy of Ensigns as a teacher in 1801, referring to his translations that were not published in Brazil, that is, those published in Portugal (Marie and Cousin) and the one that remained unpublished (Lacroix's Geometry[42]), stating that he was the only teacher that had not been promoted when he became a teacher at the Academy.

This letter seems to have achieved its aims, as in 1813 (Decree of January 30) Guimarães was promoted to staff Sergeant-Major, with a corresponding increase in pay.

In 1813 Guimarães became the editor of both *Gazeta do Rio de Janeiro* (1813-1821) and *O Patriota* (1813-1814). These two journals will be analyzed in the next section. In the same year his translation of S. F. Lacroix's *Complement des Elements d'Algèbre* (the French first edition appeared in Paris in the year 1799/1800) was published as

[39] The *Memorial* was composed at the *Dépôt General de la Guerre*, and seven volumes were published in Paris by the *Imprimerie de la Republique* from 1802 to 1810. The decree referred to the papers published in the *Memorial* as *"*[…] *as bellas Memorias, que se achão no Manual Topographico, que publíca o Archivo Militar de França.*" (LEGISLAÇÃO, 1826, p. 939). I thank Patrice Bret for calling my attention to this journal.

[40] Here he mentions Book III, Part 2, Section 4, Chapter 4, Paragraph 21 (ESTATUTOS, 1972; p. 195).

[41] This is also because of the characteristics of a school for engineers: *"*[…] *the Astronomy taught at the University is much more developed, and rightly so, considering the different aim of the engineer"* [*"*[…] *a Astronomia que se explica na Universidade he muito mais extensa, e assim deve ser, attendendo-se ao differente fim a que se propõe o Engenheiro"*].

[42] It was finally published in Brazil in 1824.

Complemento dos Elementos de Álgebra (LACROIX, 1813). This text was translated in order to function in the Academy's reading list as a substitute for the untranslated second volume of Euler's *Elements of Algebra*.

The Royal Press published the two textbooks for the students of the Academy that were mentioned in his 1812 letter: in 1814 there appeared *Elementos de Astronomia para uso dos alumnos da Academia Real Militar (Elements of Astronomy for the use of the students of the Royal Military Academy)* (GUIMARÃES, 1814) and in 1815 *Elementos de Geodesia para uso dos discipulos da Academia Real Militar desta Corte (Elements of Geodesy for the use of the students of the Royal Military Academy of this Court)* (GUIMARÃES, 1815).

The Opening Remark ("*Advertência*") of the Astronomy textbook[43] not only reasserts the main influences in his work, but explicitly states the influence of the English astronomers (GUIMARÃES, 1814):

> *"The present Elements are compiled from the most reputed Authors, who have written about Astronomy, not only those mentioned in the Decree of December 4, 1810, Section 2, § 4, but others, who I read, as much as my little free time allowed. The Physical Astronomy of* Biot, *the Works of* Vince, *of* Mackay, *and other English Astronomers gave much enlightenment for this Textbook, which seems to me to include the necessary knowledge of that Science for a soldier. Therefore it is from this point of view that its worth must be appraised"*[44].

The last part of this quote is a clear indication that Guimarães had written a more elementary textbook than he could have done, precisely because he was aware of the shortcomings of the readership to which it was aimed.

The publication of these two textbooks is one of the reasons that in 1815 he was promoted to lieutenant-colonel (graduated) (Decree of November 13), following a report by the Military Board of the Academy, which included Stockler among its members.

His rise in the military hierarchy continued: in 1818, he was appointed to staff lieutenant-colonel (*tenente-coronel efectivo*)- Decree of February 6-, and in 1819 he became a colonel (graduated) -Decree of May 13-. He retired from the Royal Military Academy in 1821 (April 21), having completed 20 years of teaching in both Academies.

[43] There is no corresponding introduction in the geodesy textbook.

[44] *"Os presentes Elementos são compilados dos mais célebres Authores, que tem escrito sobre a Astronomia, não só dos apontados na Carta de Lei de 4 de Dezembro de 1810 no tit. II § 4, mas de outros, que consultei, quanto me permittio a brevidade do tempo. A Astronomia Physica de* Biot, *as Obras de* Vince, *de* Mackay, *e outros Astronomos Ingleses fornecerão muitas luzes para este Compendio, o qual me parece conter daquella Sciencia os conhecimentos necessarios a hum Militar. Por tanto he neste ponto de vista que deve pezar-se o seu merecimento*".

6. Guimarães as journal editor

Guimarães was also active as an editor of journals. Two of them, *Gazeta do Rio de Janeiro* and *O Espelho*, were journals which essentially compiled information from various sources, so there was little scope for a personal project. In the former information about the sciences in Brazil was regularly included, while in the latter, which appeared the year before Brazil's independence, there was mostly information relevant to the process that led to the political separation of Portugal and Brazil. As to the third one, *O Patriota*, this was a more personal project, reflecting Guimarães' own intellectual standpoint.

6.1. The *Gazeta do Rio de Janeiro* (1813-1821)

In 1813 Tibúrcio José da Rocha, the first editor of *Gazeta do Rio de Janeiro*, was dismissed, and Guimarães was appointed in his place, remaining editor until 1821. This journal was the property of the War and Foreign Affairs State Secretariat (*Secretaria de Estado dos Negócios Estrangeiros e da Guerra*) and was modelled on the *Gazeta de Lisboa* (the Lisbon Gazette), an official Portuguese periodical. It was first published on September 10, 1808, and was intended to be weekly, but from issue 2 it started to appear twice a week[45]. Usually it had four pages, but sometimes it could have six or eight. It published information from various government departments, as well as information about Europe. Being a government journal, as a rule it excluded any news that could be considered controversial or that could provoke unrest. It is unusual that among its censors there were people with scientific knowledge and education: José da Silva Lisboa (1756-1835)[46], José Bernardes de Castro[47], Mariano José Pereira da Fonseca (1773-1848)[48], Silvestre Pinheiro Ferreira (1769-1846)[49]and José Saturnino da Costa Pereira (1773-1852)[50]. The last four

[45] For a study of the *Gazeta do Rio de Janeiro*, see (DE OLIVEIRA, 1997), (DE OLIVEIRA, 2008; pp. 33-52) and (DA SILVA, 2007)..

[46] See (DA SILVA, 1858-1870, Volume V; pp. 124-133), and (DA SILVA, 1858-1870, Volume XIII; pp. 200-209). Lisboa graduated in Canon Law at Coimbra University in 1779, and was teacher of Rational and Moral Philosophy in Bahia (his birthplace) for nineteen years. He returned to Portugal in 1797, where he published his first works on political economy and on merchant law, and went to Brazil in 1798, where he was appointed secretary of the Inspection Committee of Bahia. There he stayed until the arrival of the Regent Prince in Brazil, in 1808. On June 26, 1808, together with José Bernardo de Castro e Mariano José Pereira da Fonseca, he was appointed a member of the Administration Board of the Royal Press. He went to Rio de Janeiro, and soon had several political jobs; among them he became a member of the tribunal of the Committee of Commerce, Agriculture, Factories, and Navigation of Brazil. He later became Viscount of Cairu.

[47] See (DA SILVA, 1858-1870, Volume IV, p. 272) and (DA SILVA, 1858-1870, Volume XII, p. 258). De Castro was a member of the Inspection Committee of Lisbon, and like José da Silva Lisboa, also of the Committee of Bahia. He was one of the first directors of the Royal Press, being appointed twice: first from 1808 to 1815, and again from 1815 to 1821. See note 46.

[48] See (DA SILVA, 1858-1870, Volume VI, pp. 147-148) and (DA SILVA, 1858-1870, Volume XVI, p. 369). Da Fonseca graduated in Mathematics at Coimbra University. He was a member of the Administrative Board of the Royal Press. See note 46. He later became Marquis of Maricá.

[49] See (DA SILVA, 1858-1870, Volume VII, pp. 259-273) and (DA SILVA, 1858-1870, Volume XIX, p. 213). Ferreira was a member of the Lisbon Academy of Sciences and of *L'Institut* of Paris. To avoid being arrested for political reasons he left Portugal in 1797, spending a few years in England, Holland, France and Germany, and returning to Portugal in 1802, where he was appointed a member of the Foreign Office. In Holland in 1808 he

went on to work with Guimarães on *O Patriota*. Some of the articles found in the *Gazeta* are abstracts with technical and scientific characteristics. Often the articles dealt merely with the practical character of scientific knowledge. Others were reprints of articles that had appeared in two other journals, the *Patriota* and the *Correio Braziliense*[51](The Brazilian Post), the latter a Brazilian/Portuguese journal published in Britain. It became routine to report the beginning of the academic year of the Royal Military Academy in the *Gazeta*. In 1818 it published a list of teachers of the Royal Academy of Ensigns and a list of its pupils in separate issues. There were also many advertisements in the *Gazeta*, which initially were published free of charge. Through these it was possible to be informed about publications in Brazil. José Carlos Oliveira (DE OLIVEIRA, 1997; pp. 48-57) counted 120 books advertised in the period 1808-1820, an average of ten per year. These included the textbooks used in the courses founded by King D. João VI (about 30%), books on medicine ((15%), and many other subjects, including agriculture, chemistry, drawing, engineering, history, meteorology, geodesy, botany, natural history and philosophy, with one or two titles per subject. The overwhelming majority of these works were in Portuguese, with 10% being in French. Few works were included from Portugal (7%), one of them being Garção Stockler's *Ensaio Histórico sobre a Origem e Progressos das Mathematicas em Portugal* (Historical Essay on the Origin and the Progress of Mathematics in Portugal), advertised in the *Gazeta* in the same year it was published in Paris (1819). Another was Guimarães's *Elementos de Geodesia* (Elements of Geodesy), the advertisement for which appeared in 1815.

6.2. *O Patriota* (1813-1814)

In 1813 Guimarães founded the journal *O Patriota*[52], a journal which had on the cover of every issue "Literary, Political, Mercantile, etc. Journal from Rio de Janeiro"[53]. In fact it had a wide range of sections, and its importance comes from the fact that it was the first journal in Brazil which had a place for the dissemination of scientific culture, publishing well-prepared features on science and the arts. It had on the title page of all its issues a couplet by one of the most important Portuguese humanists of the Renaissance,

published the important *Notas ao Ensaio sobre os Principios de Mechanica, obra posthuma de José Anastácio da Cunha, etc* (Notes on the Essay on the Principles of Mechanics, posthumous work by José Anastácio da Cunha, etc), followed by his own *Principios de Mechanica* (Principles of Mechanics). In 1810 he was in Rio de Janeiro, where he was appointed member of the Commerce Board.

[50] See (DA SILVA, 1858-1870, Volume V, pp. 120-121) and (DA SILVA, 1858-1870, Volume XIII, pp. 198, 379). Costa Pereira was an officer in the Engineering Corps and a teacher at the Royal Military Academy of Rio de Janeiro. Among other books, he translated Francoeur's *Elementary Treatise of Mechanics*, divided into four sections: Statics, Dynamics, Hydrostatics and Hydrodynamics. He was the brother of Hipólito José da Costa Pereira (1774-1823), the editor of *Correio Braziliense*. On Hipólito see (DA SILVA, 1858-1870, Volume III, pp. 198-200) and (DA SILVA, 1858-1870, Volume X, p. 34).

[51] On the *Correio Braziliense* and *O Investigador Portuguez em Inglaterra*, both Portuguese periodicals published in Britain, see (DE OLIVEIRA, 1998) and (DE OLIVEIRA, 2008; pp. 91-148)

[52] For studies on *O Patriota* see (DE OLIVEIRA, 2004), (DE OLIVEIRA, 2008; pp. 55-88) and (KURY, 2007).

[53] *"Jornal Litterario, Politico, Mercantil, &. do Rio de Janeiro"*.

António Ferreira (1528-1569)[54]. In a thematic index published in the last issue of the journal, it included under "Sciences": mathematics, navigation and hydrography, hydraulics, botany and agriculture, chemistry, medicine, mineralogy, and meteorology. It had also sections on literature, commerce, history, politics, and others. It was first published in January 1813, appearing monthly in 1813 and bimonthly in 1814. A total of 18 issues were published in three series, the first two for the first two semesters of 1813, with six issues each, the third series for the six issues of 1814.

Guimarães wrote the opening text of *O Patriota*'s first issue, in which he explained why he had founded the journal. He emphasized the need for scientific societies, using a very simple but effective metaphor from physics:

> *"Scholars learned from physics that the rays of the sun when scattered are only able to heat hard bodies, but if they converge on a focus they melt the densest metals. Therefore they proposed to communicate their lights [knowledge] to each other, so that from their sum might result that intense heat which would overcome the coldness of laziness and the hardness of ignorance. Their first works opened the way to other works, which were more improved".*[55]

He noted that many important works lay forgotten, underlining the usefulness of studying the mathematicians of the past. It is significant that the only two names he mentioned were Archimedes and Apollonius, probably the two greatest innovators in Greek mathematics. He felt that there was no-one in the Portuguese empire to bring those works to the fore as a unit, as worthy of public attention. He also felt that the country was missing a golden opportunity to follow in the steps of other countries which were experiencing important scientific and cultural developments. Hence his decision to start his journal:

> *"Men of all centuries are contemporary; and the scholar in his office still learns from Archimedes and Apollonius and their ilk[…] I was convinced that highly recommendable works and very interesting news were condemned to remain forgotten, and that there was no clever hand which would compile and order these scattered data and make them into a whole, worthy of public attention. It pains me to see that the example of so many cultured nations has not aroused here the desire to do likewise, it was as if the physical location was responsible for the late arrival of the light on our horizon.[…] I did not hesitate a single moment in starting that which all the scholars before me had thought to do but*

[54] *"Eu desta glória só fico contente/Que a minha terra amei, e a minha gente"* [*"The love of my land and of my people is the only reason I am glad to be praised"*].

[55] "*Mas instruídos pela physica de que os raios do Sol, que dispersos aquecem apenas os corpos duros, juntos em hum foco derretem os mais densos metaes, os sabios se proposerão a communicar-se reciprocamente suas luzes, para que da união d'ellas resultasse aquelle intenso calor, que vencesse a frieza da priguiça, e a dureza da ignorancia. As suas primeiras Obras abrirão o caminho a outras mais perfeitas."* (O PATRIOTA, 1813; 1st series, 1, pp. 3-4).

> *(unfortunately) had not persisted, frightened by the difficulties, which problematic circumstances made almost unsurmountable"*.[56]

Guimarães was aware of the difficulties that lay ahead and that it would be a long process to produce the journal with all the requisites he had in mind. But all had to be put in context and analyzed in terms of the specific situation he and the other collaborators were facing. So he wrote:

> *"But for once listen to d'Alembert's trustworthy thought: you must not examine whether a work is done well or badly, but whether it could have been done better"*.[57]

And he ended the introduction with a message of hope, saying that scholars had responded positively to his call for collaboration:

> *"*[…] *improving successively, we should expect the level of excellence which only time brings, and my inadequacy will not damage this project, as scholars have not refused to honour this journal"*.[58]

Among the *Patriota*'s contributors were, besides Guimarães, the mathematicians Garção Stockler[59], José Saturnino da Costa Pereira and Mariano José Pereira da Fonseca, the last two already mentioned above as being collaborators in the *Gazeta*. Also working on both journals were two other contributors mentioned above, José da Silva Lisboa and José Bernardes de Castro, both members of the Administrative Board of the Royal Press. Among the scientific matters discussed in the *Patriota*, the most debated was agriculture, with special emphasis on the new scientific techniques used in this field. Although several mathematicians were collaborators, little mathematics is mentioned. In the first issue of the first series the sole explicit mention of mathematics is in the section on books published in Rio de Janeiro during January (O PATRIOTA, 1813; 1st series, 2, pp. 120-121). Two books are mentioned, both textbooks for the Royal Military Academy of Rio de Janeiro: the

[56] *"Os homens de todos os Séculos são contemporâneos; e o sábio no seu gabinete instrue-se ainda hoje com os Archimedes e Appolónios* […] *Convencido de que apodreciao no esquecimento Obras assaz recomendaveis, e notícias de sobra interessantes, sem que huma mao hábil colligisse, e ordenasse aquelles dispersos membros, e formasse um todo digno de attenção publica, doendo-me de que não acordasse a emulação á vista de tantos modelos das nações cultas, como se a posição physica retardasse a luz a chegar ao nosso horizonte* […] *eu não hesitei hum momento em emprehender aquillo, que todos os Litteratos, primeiro que eu, haviao pensado, e de que (infelizmente) abrirão mão, atterrados com os embaraços, que circunstancias melindrosas tornavão quase insuperáveis"* (O PATRIOTA,1813; 1st series, 1, pp.3-5).

[57] *"Mas cedão huma vez á seria reflexão de d'Alembert: não se deve examinar se a obra está bem feita, mas se era possível faze-la melhor"* (O PATRIOTA, 1813; 1st series, 1, p. VI).

[58] *"*[…] *deve esperar-se que, melhorando successivamente, toque o grão da perfeição, que só do tempo póde esperar, não empecendo aos meus votos a minha insufficiencia huma vez que Sábios não se tem negado a honrar este periódico."* (O PATRIOTA, 1813; 1st series, 1, p.VIII).

[59] Stockler was a collaborator and a subscriber to the first series of *O Patriota*. He has a poem ("Ode") published in its first issue (O PATRIOTA, 1813; 1st series, 1, pp. 74-76) dedicated to the academician António Ribeiro dos Santos (1745-1818), one of the first historians of Portuguese mathematics.

Portuguese translations of Louis Benjamin Francoeur's *Traité de Mechanique Elémentaire* and René Juste Haüy's *Traité Elémentaire de Physique*. The first was translated by Costa Pereira, and the anonymous review (Guimarães ? Costa Pereira ? Another?) shows knowledge of the work in that it states that the translator added extracts not only from works mentioned on the cover of the Portuguese version, but also from several others, notably Laplace's *Celestial Mechanics*. In issue number two of the same series appeared the only mathematics paper published in *O Patriota*: *Indagações do sólido de maximo volume entre todos de igual superfície* (Research on the solid with maximal volume among all those which have equal surfaces) by José Saturnino da Costa Pereira (O PATRIOTA, 1813; 1st series, 2, pp, 3-7). Here Pereira solves a problem of optimization using differential calculus of functions of more than one variable. He shows that all sections of the solid parallel to the *xoz* plane are circles; therefore he concludes that the solid is a sphere. He ends his paper by stating that the problem of calculating among solids of the same volume the one with the largest surface has a similar solution to the above problem, and the solution is also a sphere.

In the last published issue, issue number six of the third series, dated December 1814, there is no hint as to why the journal is being suspended, as there is no editorial text. At the end of the last issue in each of the first two series (that is, in the journals of June 1813 and of December 1813) a list of its subscribers was published. We can see that there was a considerable fall in the number of subscribers from the first series to the second: there were 162 subscribers in the first series[60] while for the second the number was reduced to 104, a reduction of about 36%. More than half of the subscribers of the first series (89) did not renew their subscriptions. The remaining 73 subscribers were joined by a further 31 subscribing to the second series. There is no list of subscribers in the last issue of the third series, so we cannot compare the number of subscribers of the third series to the numbers given for the first two series as stated in *O Patriota*. One can conjecture that if there was a similar decrease from second to the third series this could be one reasonable reason for ceasing to publish the journal. Also the final issue ends with an index with all the papers that appeared in the three series of the journal (O PATRIOTA, 1814; 3, 6, supplement, pp. 1-13), and this can be interpreted as the editor (and possibly his collaborators) at least thinking that one chapter of the journal's life had ended, so in some way this list was a summary of what had been published in those two years. Since it was a monthly publication, there is a clear possibility it was known that this was to be the last issue of the journal. To have a definitive and well-founded opinion we would have to research their private letters in order to establish what really happened.

6.3. *O Espelho* (1821-1823)

Guimarães left the *Gazeta* in July 1821. Three months later, in October 1821, he started publishing *O Espelho*, a Rio de Janeiro journal founded with the aim of helping to strengthen the Brazilians' resistance to the Portuguese (DAMÁSIO, 1844; p. 374). On this

[60] Only in Rio de Janeiro; outside Rio it was said that the journal did not know all their names; it was promised that this data would soon be made public, but this did not happen.

journal opinions diverge: while (DAMÁSIO, 1844; p. 374) values the journal highly, quoting Father Ignácio José de Macedo (1774-1834)[61], who said that *O Espelho* did made more damage to the Portuguese than an army of 10,000 men, (SODRÉ, 1966; pp. 67) is hignly critical of the journal's standpoint:

> *"A Court journal, pretending to be impartial and neutral – and there is no more vile way of participation than omission [… Guimarães] acquired [while working in the Gazeta do Rio de Janeiro] the shortcomings of official journalism, and he never got rid of them. He took no position, had no opinions.* […] *His neutrality saved it from the repression that destroyed the free press of that time"*.[62]

In spite of this valuation, we should not ignore Macedo's appraisal, especially given his liberal views. However, for a definite judgement on the journal some extensive research would be required, including an analysis of all its issues, which is clearly beyond the scope of this paper.

The first issue of *O Espelho* was published on October 1, 1821, and the last 21 months later, on June 27, 1823. It started out as a weekly journal, then from January 1822 onwards it was published twice a week. It transcribed many items from Lisbon papers, others from the *Correio Braziliense*, and still others from newspapers in Bahia and Pernambuco. It also included many official items, like the reports of Parliamentary sessions, which were regularly transcribed in its pages, and in this way the journal is an important source of data for the period during which it existed.

7. Concluding Remarks

The series of translations of mathematical texts published in Rio de Janeiro between 1809 and 1814 are something unique in the context of Portuguese history of mathematics. In clear contrast to what happened with the reform of Coimbra University in 1772, in which six textbooks were translated, four by Monteiro da Rocha, here we had a group of five teachers translating a significant corpus of 16 important mathematical texts in

[61] See (DA SILVA, 1858-1870, Volume III, pp. 209-210) and (DA SILVA, 1858-1870, Volume X, p. 53). Macedo, born in Porto, went to Brazil when he was eight years old, and there stayed for 40 years. He was a philosophy teacher and a preacher in the King's service, a synod examiner and a Court censor. He was one of the editors of Bahia's *Idade de Ouro do Brazil* (Brazil's Golden Age), the second journal to be founded in Brazil (1811-1823), printed in Manoel António da Silva Serva's press. Sodré (1966; pp. 34-35) states that this journal coherently defended the standpoints of the Portuguese, and was similar to the government journals. Macedo returned to Portugal in 1823, after Brazil's independence, and became the editor of the journal *Velho Liberal do Douro* (Douro's Old Liberal), a journal that, as the name suggests, defended liberal ideas. Macedo stood by his ideas, and during the period of civil unrest that opposed liberals and absolutists he was persecuted and imprisoned by the absolutists.

[62] *"Órgão áulico, com pretenções à imparcialidade e à neutralidade – e não há forma mais torpe de participação que a omissão- […Guimarães] Trazia [da Gazeta do Rio de Janeiro] o calo do jornalismo oficial, de que nunca se livrou. Não tinha posição, não opinava. […] Sua neutralidade salvou-o da repressão que destruiu a imprensa livre da época"*.

a very short period of time, in an Academy that had recently been founded and was just starting its academic life, and in the process of creating its own tradition. By the end of 1815 all the textbooks for the first two years mentioned in the founding decree had been translated, and all the other major textbooks had been either translated or being written[63].

Of all the lecturers of the Royal Military Academy, Guimarães was the only one who had experience of publishing translations of mathematical books before being appointed to the Academy. In fact we saw that as early as 1799 he translated two chapters of Lacaille's elementary course of mathematics, when he was a 21-year old first-year student of the Navy Royal Academy. The kind of classical education he had in his youth, with classes of Latin, Greek, French, Italian and English, must have given him an above average ability in languages. We can also clearly see that he had some knowledge of the mathematical publications of the time, and of some foreign universities, and he had his own ideas of what his courses should be like, trying to combine the use of the textbooks stated in the founding decree with the use of books he thought were best for his courses. This we saw in his reading list for astronomy, in which he clearly strayed away from the French authors listed in the founding decree of the Academy (although still using them) and recommended English books. And he never forgot that he was addressing students without a solid mathematics background, as he conscientiously chose the more elementary parts from his own reading list, stating that the aims of an engineer were different from those of a university student. Of the teachers at the Royal Military Academy, by 1815 he was the only one who had published his own textbooks for his Academy course, and in this way all the subjects that were dealt with in his course could be studied in Portuguese, either in his own textbooks or in Portuguese translations of the recommended book list.

His excellent education was reflected both in his writings and in his letters, both by the careful choice of quotations that marked his reasoning (from classical as well as contemporary authors), and by the cultured view that could be seen in his argumentation, holding as important such dissimilar sources as the *Encyclopédie* and Portuguese poets. This combined knowledge was put to good effect in his periodical *O Patriota*, which significantly had on the title page of all its issues a couplet by Ferreira. It was precisely Guimarães' cultured education that was instrumental in the creation of Brazil's first periodical which included well-written features on both science and the arts.

Acknowledgements

I would like to thank Fundação Gulbenkian for their grant, which allowed me to participate in the VIII Seminário Nacional de História da Matemática, which took place in Universidade da Amazónia, Belém Pará, Brazil, in April 2009. I would also like to thank Sociedade Brasileira de História da Matemática for their invitation to participate in this event, and the local organizing committee, and in particular Professors Iran Abreu Mendes and Sergio Nobre, for all their support during this meeting.

I thank Bernardo Mota for his translations of the Latin quotations, Cristina Costa Gomes for revising my transcription of Manoel Guimarães' letter to D. João de Almeida,

[63] For more data on this group of translations see (SARAIVA, 2007), in particular pp. 27-31.

General Silvino Curado for clarifying matters on Portuguese military ranks, Commander António Canas for his help in finding the English equivalent for the Portuguese military ranks, and Ana Patrícia Martins for her helpful remarks on a first version of section 1.

I also thank Paul Covill for revising the English of this text.

The research for this paper was supported by Fundação para a Ciência e Tecnologia, Financiamento base 2008, ISFL/1/209.

Appendix

Letter from Manoel Ferreira de Araujo Guimarães to D. João de Almeida, Minister
(in Secção de manuscriptos, Biblioteca Nacional do Rio de Janeiro)

Ainda que eu esteja bem persuadido de que he temeridade affastar a attenção de V. Excia dos serios objectos que a occupão, não posso contudo poupar-me a huã exposição indispensavel nas minhas circunstancias. Hum digno Ministro, que se dignava de dar-me o nome de amigo, deixando no meu Coração huã interminavel saudade; me deixou igualmente a necessidade de fazer conhecer a maneira, com que hei satisfeito às obrigaçoens do meu emprego, e por ventura às suas superiores vistas. O conhecimento, que Elle tinha dos meus pequenos talentos, e mui limitadas luzes, adquirido durante um longo magisterio, e pela publicação de muitas obras, não se compadecendo com a nenhuma notícia que V. Excia delles terá, assim nos dez annos, em que tive a honra de ser lente da Academia Real dos Guardas-Marinhas, como no tempo que tenho servido na Militar, rogo a V. Excia que desculpe as inaptas reflexoens que vão subir à Sua Presença e que sem duvida serão hum testemunho de meu tenue saber.

Por Decreto de 28 de Fevereiro do anno passado, fui trasladado da Academia Real dos Guardas Marinhas para a Militar e destinado para reger a cadeira do quarto anno. Consultando a Lei achei no Titulo II §4. a enumeração das matérias, que devia explicar. A Trigonometria espherica de Legendre havendo já sido por mim, traduzida (juntamente com a Geometria e a Trigonometria plana, que fazem a parte principal do 1º anno), e havendo sido encarregado da Traducção da Optica de Lacaille o 1º Tenente André Pinto Duarte depois Lente do 2º anno, seguia-se explicar o systema do mundo. Apontava a Lei para este fim as obras de Lacaille, Lallande e Laplace. Reflectindo sizudamente sobre o espírito da mesma Lei, e combinando quanto era possível as applicaçoens da Engenharia com os Estatutos da Universidade de Coimbra, Livro 3, Parte 2, Título 4, Capítulo 4, eu assentei que nada havia melhor do que combinar a Astronomia Physica de Biot (Paris, 1805) com os Elementos d'Astronomia de Vince, para uso /fl. 2./dos Alumnos da Universidade de Cambridge (Cambridge 1801). Escolhendo destes Authores o que me pareceu mais elementar, ajuntando os resultados de Delambre, e Laplace, e da obra de Mackay sobre as longitudes (Aberdeen, 1801), assim como, dos Elementos de Navegação de Barquos, Bezout e Rios, ixtrahindo os methodos mais faceis nem desprezando a explicação das Requisite Tables de Maskalyne (Lond., 1802) nem a das Ephemerides de Coimbra por Joze Monteiro da Rocha; eu creio ter incluído o que a Lei prescreve, e algumas vezes consegui para este plano a Approvação do Sub-Ministro, que me havia destinado tão ardua tarefa. Julgando não dever sacrificar a clareza à brevidade, achei-me com hum compendio mais

volumoso do que era minha tenção. E por isso fiz o Extracto, ou Analyse junta, para que, a hum golpe de vista podesse por elle ajuizar-se da ordem e distribuição das materias, da extensão com que forão tratadas, e das fontes de que se derivarão.

Restava outro objecto, as applicaçoens convenientes às medidas geodesicas, que a Lei ordena ao Lente de 4º anno que novamente dará em toda a sua extensão. No §1 do mesmo titulo, havia Elle ordenado que o Lente do 1º, explicasse toda a extensão da Geodesia, exceptuando somente o que os Estudantes não podessem comprehender pela falta da Trigonometria espherica, da qual devendo-se dar princípios no mesmo anno, se reservou a totalidade para o quarto, provavelmente por Determinação da Junta. Mas eu não sei se houve igualmente Ordem para se faltar inteiramente a dar as noçoens da Geodesia (que pela maior parte não são mais que applicaçoens da Trigonometria), vindo esta sciencia a recahir toda sobre o lente do 4º, assaz sobrecarregado de differentes materias, cuja explicação caberá dificilmente no curto prazo de nove mezes.

Não determinando a Lei a qual dos dois Lentes pertencerá semelhante Redacção; sem embargo de ser muito facil concluir que ao do 1º anno, acrescentando-se mais que este achava prontos quase todos os Compendios respectivos, limitando-se o seu trabalho à Traducção do 1º Volume da Algebra de Euler, cuja correcção pertenceu já ao lente do 3º anno,/fl. 3/ eu não quis, poupar-me a este trabalho; preferindo à falta do meu dever o excesso do trabalho incompetente. E persuadido que nada ha que acrescentar ao que se achar espalhado por differentes Memorias do Memorial Topographico e Militar (obra recomendada no mesmo titulo §5) destas transcrevi o que forma o Compendio de Geodesia, no qual, alem deste objecto, diz huã noção de Cartas Geographicas, das projecçoens, e mais objectos recomendados pela mesma Lei. Ajuntei alguãs notas, não continuando este trabalho (como fora meu entento) para reserva-lo à explicação vocal, ou minha, ou de quem mais dignamente encher este lugar.

Quanto às noçoens geraes sobre Geographia do globo, em suas divisoens, fica dito assaz no Compendio de Astronomia, a demais, pareceu-se muito acertado o que a este respeito dizem os Estatutos de Coimbra, Livro 3 Parte 2 Titulo 4 Capitulo 4 §21. Portanto reservo para explicar vocalmente a parte mathematica da geographia, porque a physica e a [politica ?] nem pertencem ao corpo das Mathematicas nem carecem da voz do Mestre para se estudarem e comprehenderem.

Agora que presumo haver satisfeito a quanto me incumbia, surge licito fazer alguã reflexão sobre as materias, que involve este as[sumpto]. Confeço que a Astronomia, que se explica na Universidade, he muito mais extensa, e assim deve ser, attendendo-se ao differente fim, a que se propoem o Engenheiro. Mas sei também que [a] Optica pertence ao terceiro anno, ou à Phoronomia, porque não ha mais do que o [movi]mento da luz, e portanto se comprehende na denominação geral de movimento dos corpos (Jb. C3 §16-19), e se a Lei muito sabiamente isentou d'ella o terceiro anno da Academia Militar, por ventura em attenção à importancia e multiplicidade das materias que o compõem, para não haver imposto ao Lente d'Astronomia a pensão de explica-la em toda a sua extensão, quando no mesmo anno manda explicar a Physica de Haüy, da qual um terço tem por objecto a luz, sua propagação, reflexão, refracção, etc, o que vem a dar o mesmo que a Optica, Catoptrica e Dioptrica. Todavia eu creio que a Lei nisto quer dizer que o Lente d'Astronomia lerá o que ha de Calculo e Geo-/fl. 4/metria na Optica, e o de Physica o que pertence à aquella

Sciencia, sendo muito proprio explicar as propriedades do fluido que nos allumia, depois de haver desenvolvido os daquelle que nos cerca e alimenta, daquelle que assim comunica os nossos pensamentos, do eléctrico, do galvanico, e do magnetico. Neste caso porem he claro que era necessario hum Extracto da Optica de Lacaille, e não huá traducção, e talvez mesmo seria preferível a Óptica de Wood, impressa em Cambridge no anno de 1802. Não insisto porem neste assumpto, porque comparando o que recomendão os §§1 e 2 com o que existe feito para os dois primeiros annos, estou bem longe de persuadir-me que a Lei está desempenhada nesta parte.

Se, apezar do que esta mesma Lei determina acerca da Geodesia, e as razoens, que apontei, continuar ella a reservar-se na sua totalidade [pa]ra o 4º anno; este, já sobejamente crescido, havendo herdado do primeiro os Princípios da Trigonometria Espherica, e alguãs outras materias deste e dos outros annos cuja ommissão resulta da não- conformidade dos compendios, ou não podera ser só comprehendido em tempo igual [no]s outros, ou o Lente respectivo, ajuntando à inhabilidade, que lhe he propria, as angustias do tempo, será obrigado a ler materias, que deveria explicar e meditar.

Concluo esta Memoria, lembrando que são quase completos onze annos da regência da cadeira, com hum desempenho constante: que traduzi os Elementos de Marie e a Analyse de Cousin, e para a Academia Militar, a Geometria de Lacroix, que não se imprimio por se adoptar a de Legendre, com a sua Trigonometria; que estava encarregado da parte mais difícil do terceiro anno, quando em Março do anno passado fui nomeado Lente do 4º, ou como o mais antigo, ou por acabar de ler, na Academia dos Guardas-Marinhas, materias analogas, e contando quasi metade do tempo que desde então tem percorrido, faz enfermo, o que se manifestou nos exames de primeiro anno que fiz, com o maior incommodo, attendendo ao numero de livros que me foi necessário /fl. 5/ consultar; ao embaraço que encontrei no Director da Bibliotheca dos Guardas-Marinhas, negando-me os livros de que precisava, e que eu podia consultar enquanto Lente d'aquella Academia; e ao nenhum socorro que recebi do Arquivo Militar; eu creio que não será desprezar o meu trabalho, que ficará claro que, se os meus escassos conhecimentos não fornecem maiores resultados, ao menos não me esquivo a fadiga alguã para encher um lugar, do qual forcejo por ser cada vez menos indigno.

Eu não sei, se à vista do expendido, estou nas circunstancias de ser attendido, como insinua o §3 do Titulo 3. Sou o Lente mais antigo, estou empregado em serviço da Academia desde 1808, fui o primeiro que imprimi nesta Corte huã Obra Mathematica, com artistas inteiramente ignorantes deste genero, com immenso trabalho incommodo da minha saúde, e até despojo, devendo-se à minha assiduidade não só huã edição mais correcta do que fora de esperar, mas a habilitação dos Compositores para a continuação de semelhantes trabalhos; em nenhum acaso tive na passagem para a Academia Militar, enquanto todos os outros pela sua admissão obtiverão postos; e de todas estas circunstancias me fizerão digno da contemplação de V. Excia, não haverei muito importuná-lo com mais alguã supplica.

Limito-me somente a rogar a V. Excia que huã vez que os Compendios que apresento, hajão merecido approvação de V. Excia ou da Junta Militar, me sejão entregues, para os hir continuamente polindo e corrigindo até a occasião de entrarem no prelo, seguindo-se d'aqui a perfeição, que não he compatível com a celeridade com que forão escritos.

Deus guarde a V. Excia como requer o Bem do Estado
Rio de Janeiro, 2 de Abril de 1812

Manoel Ferreira de Araujo Guimaraes

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