

# MATHEMATICS IN PRIMARY EDUCATION IN THE STATE OF PARÁ (BRAZIL), BETWEEN 1890 AND 1930: ON RULES, REGULATIONS AND TEXTBOOKS

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## ABSTRACT

The article describes and comments on the trajectories of mathematics (arithmetic, geometry and design) of the primary school in the state of Pará (Brazil), between 1890 and 1930, based on rules, regulations and textbooks of the time. In this sense, we make a synthesis of regulations and legislation, as well as the official programs and textbooks for primary teaching of mathematics in primary schools of Pará in the mentioned period. Our main focus was to understand the scenario offered by the historical sources for the construction of a historiographical narrative on the subject. Our research was based on the cultural history as proposed by Roger Chartier (2002), Dominique Julia (2001), Peter Burke (2005), Michel de Certeau (1982) and the concepts of André Chervel (1990). We made a documentary survey on the Rare Books Section of the Arthur Vianna Library, at the Pará State Cultural Foundation, in search of answers to the following questions: *What did these teaching programs and textbooks prescribe for teaching math? What are the pedagogical concepts underlying the mathematics teaching process in primary schools of the state of Pará?* **We note that the contents were arithmetic**, problems, fractions, metric system, proportions, rule of three and interest, practical geometry, square and square root, cube and cubic root, practical notions of bookkeeping and practical rudiments of trigonometry, design and surveying. On the pedagogical conceptions we found that they were based on the thoughts of Gréard (1886) based on the method of Calkins (1886), obeying a systematic distribution, logic, with use of assets or intuitive methods. We conclude that the primary school in Pará was heavily influenced by the pedagogical ideas and concepts from the French school culture of the time, which were incorporated into the primary school of Pará in the late nineteenth century.

Keywords: Mathematics; Arithmetic; Primary Education; Teaching program; Teaching method.

## RESUMO

O artigo descreve e comenta sobre as trajetórias das matemáticas (aritmética, geometria e desenho) do ensino primário no estado do Pará (Brasil), entre 1890 e 1930, baseado em normas, regulamentos e manuais escolares da época. Neste sentido, fazemos uma síntese das regulamentações e legislações, bem como dos programas oficiais e manuais escolares

para o ensino de Matemática do primário dos grupos escolares do estado do Pará no período mencionado. Nosso foco central foi a compreensão do cenário oferecido pelas fontes históricas para a construção de uma narrativa historiográfica sobre o assunto. Nossa pesquisa fundamentou-se na história cultural como proposta por Roger Chartier (2002), Dominique Julia (2001), Peter Burke (2005), Michel de Certeau (1982) e nos conceitos de André Chervel (1990). Fizemos um levantamento documental na Seção de Obras Raras da biblioteca Arthur Vianna da Fundação Cultural do Estado do Pará, em busca de resposta às seguintes questões: *O que prescreviam esses programas de ensino e manuais escolares quanto ao ensino de Matemática? Quais as concepções pedagógicas subjacentes ao processo de ensino de Matemática nas escolas primárias do estado do Pará?* **Constatamos que os conteúdos ensinados foram aritmética**, problemas, frações, sistema métrico decimal; proporções, regra de três e juros; geometria prática; quadrado e raiz quadrada; cubo e raiz cubica, noções praticas de escrituração mercantil e rudimentos práticos de trigonometria, desenho e agrimensura. Sobre as concepções pedagógicas verificamos que as mesmas se baseavam nos pensamentos de Gréard (1886) com base no método de Calkins (1886), obedecendo-se uma distribuição sistemática, lógica, com emprego dos métodos ativos ou intuitivos. Concluimos que o ensino primário no Pará foi influenciado pelas ideias e concepções pedagógicas da cultura escolar francesa da época, que foram incorporadas ao ensino primário paraense no final do século XIX.

Palavras-chave: Matemática; Aritmética; Ensino Primário; Programa de ensino; Método de ensino.

## 1. Education scenario in Pará in the early republican period

This article presents an annotated description of the trajectories of mathematics (arithmetic, geometry and design) of the primary school in the state of Pará (Brasil), between 1890 and 1930, based on rules, regulations and textbooks of the time. In this sense, we make a synthesis of the regulations and legislation, as well as the official programs and textbooks for primary mathematics teaching of Pará state schools in the mentioned period. Our main focus was to understand the scenario offered by the historical sources for the construction of a historiographical narrative on the subject.

Our research is included as a subproject of the thematic project of an international research coordinated by GHEMAT<sup>1</sup>, which aims to identify sources that can be used in building the history of these mathematics teaching careers in various states of Brazil. To do this, we carried out our research in the Rare Books Section of Arthur Vianna Library in the Pará State Cultural Foundation, believing that historical research on the teaching of Mathematics contributed to the understanding of the general context of teaching practices in the State of Pará, with the main intention that we might be able to, having located these official documents, answer the following questions: *what did these educational programs prescribe for teaching math? What are the pedagogical concepts underlying the mathematics teaching process in primary schools of the state of Pará?*

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<sup>1</sup> The Research Group of Mathematics Education History was created in Brazil in 2000. The group, which is registered in the Directory of Research Groups of CNPq, has as its leaders professors Neuza Bertoni Pinto (PUC-PR) and Wagner Rodrigues Valente (UNIFESP - Guarulhos Campus).

We've already managed to locate a vast literature on the subject, in this very specific case we intend to analyze only the aforementioned document, that is, the year 1890 – taking into consideration that it is very central to the transition from imperial state to Republic, i.e. in 1889 – a period which ended 49 years of imperial absolutist government; also, the period prior to promulgation of the first constitution of the Republic, which occurred only in 1891. This "first constitutional charter of the Republic was more concerned with issues of formal order – such as establishing skills – than with strictly educational issues" (VERONESE and VIEIRA, 2003, p. 101) and the Union was only responsible for Education at the Federal District (Rio de Janeiro). Moreover, as regards education, the analyzed document dates back to July 4<sup>th</sup>, 1890, so it precedes the Benjamin Constant Reform, which was only introduced by Decree n° 981, November 8<sup>th</sup>, 1890. Our research was based on the cultural history proposed by authors such as Roger Chartier (2002), Dominique Julia (2001), Peter Burke (2005), Michel of Certeau (1982) and the concepts of André Chervel (1990), which have been much used by researchers who address the theme of knowledge of the school culture.

The scenario in the state of Pará shortly after the establishment of the proclamation of the Republic on 1889 was that a temporary joint was implemented by the government as a result of the deposition of the former president of the province, Antônio José Ferreira Braga. On December 17<sup>th</sup> of that same year, the joint was undone by the then head of the temporary Republican government, Marshal Deodoro da Fonseca, who immediately appointed Justo Chermont as governor of the State, a position in which he remained until February 7, 1891, when he was replaced by Gentil Bittencourt.

In the year following his appointment, 1890, Justo Chermont enacts the General Regulations of Public and Special Instruction in the Primary Education of the State of Pará – this decree still originated, in the same year on July 4, the *source* document, main target of this article - *Primary Education: school regulation, programs, schedules and instructions*, from the same year, conceived and designed by José Veríssimo, who at that time was director of public instruction (a job that is the modern equivalent to the Secretary of Education).

However, at this early period, the advent of the new system did not bring significant changes to public education; only after a certain maturity would occur. (...). The new education would go on to follow positivist principles instead of theology (SILVA, 2011, p. 17).

Likewise, the government of the republic did not give much importance to primary and secondary education, leaving this responsibility in the hands of the provinces, which mostly did not possess sufficient resources or the interest to increase it.

This article is designed so that it can express a global perception of the analyzed documents, since we organized our analysis highlighting the points that we consider important from each document, to emphasize the political scene, pedagogical concepts and especially the mathematical contents established for primary education in the state of Pará in that period. We note that the quotes mentioned in this article – extracted from documents – comply with the spelling of the time. Let's see some of the general aspects of the documents used as historical sources.

## 2. General aspects of the documents used as historical sources

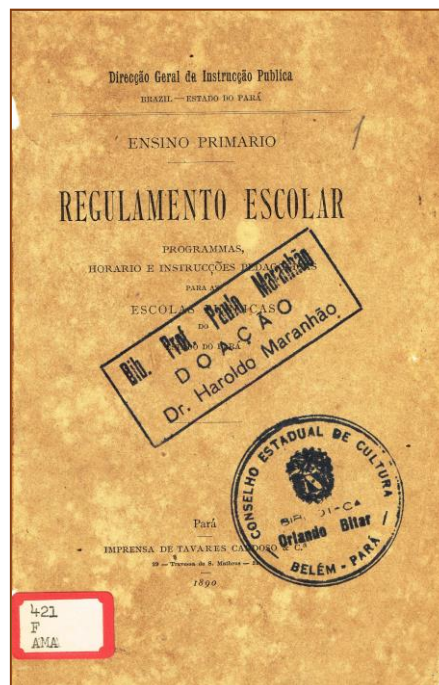
The document *Primary Education: School Regulation programs, schedules and instructions* (Fig. 1) – is organized as follows: in its first part appears the order of the then Governor of the Province, Justo Chermont, who declares approved the actions of the general director of public education, in this case the aforementioned document. On the next page the general director of Public Education José Veríssimo gives his order based on the of the provincial governor's authority, stating that "public schools in this state be ruled by the following school regulation, and programs, schedules and instructions and directions attached thereto" (PARÁ, 1890, p. 3).

The school Regulation of Pará was composed of 47 articles, mostly with general guidelines and determinations regarding the schedule, didactical procedures and behavior of the teachers; student behavior; operation of schools such as location, furniture, etc. We noticed Article 15, which states that "No book or brochure, printed or manuscript, foreign to the teaching, may be introduced in the school without the written authorization of the General Director" (PARÁ, 1890, p. 6). This caveat may have been laid down because at the time there were no textbooks as we know them today, in other words, *manuals* or *compendiums*, as they were called, to be used in schools by the teacher, were prepared by the teacher himself or adopted by the direction of public education.

The programs and pedagogical instruction for primary education in Pará were divided into two main parts: elementary schools, divided into three years (first, second and third); and popular school, divided into three categories:

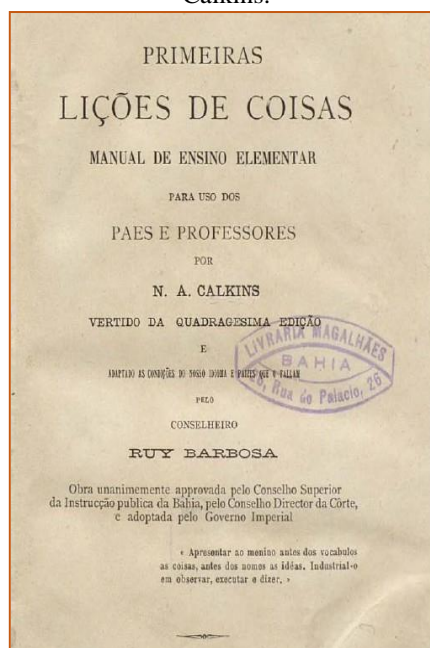
**a) Elementary Schools:** the first year in which we highlight the first point of the program: "I – Concrete teaching of formulas, colors, numbers, dimensions, time, sounds, qualities of objects, measurements, their use and application according to Calkins's "Lessons about Things" method (Fig. 2), translation by Ruy Barbosa." (PARÁ, 1890, p. 14).

Fig 1 - Document cover



Source: The State of Pará Cultural Foundation, in the Rare Works Section of Arthur Vianna Library

Fig. 2 – Cover: *Lições de Coisas* by Calkins.



Source: Senate web page. Senate Library. Rare Works

The book is authored by Norman Allison Calkins, under the original title *Primary object lessons for training the senses and developing the faculties of children. A manual of elementary instruction for parents and teachers*; the book was first published in the United States in 1861, receiving the following title in Brazil: *First lessons of things: elementary teaching manual to be used by parents and teachers*, and published in 1886, from a translation made by Rui Barbosa. The Calkins method emphasizes a systematic order of action to structure every action in school life, because, according to Calkins (1886), in the applicability of his method, learning should begin in the concrete and continue to reach the abstract, that is, start simple and then go to the complex. Initially the pupil learns the universality, then its fragments.

We realized that, in this sense, there is much of mathematics and that the educational precepts of that time were "utilitarian, conceiving that the knowledge gained at school has to be applied in their daily lives" (COELHO, MORAES and COSTA, 2007, p. 5), which is determined by the orientation of the use of the Lessons of Things method for the three years (first second and third).

In the **first year** of elementary schools, the determinations of strictly mathematical content, according to the section *Programs and pedagogical instructions for primary education in the state of Pará*, are:

IV - Arithmetic and calculation - First notions of calculation through the method of Calkins. – Count of 1 to 100. Count of things and school objects or others, the number of students, etc. – First exercises of sum and subtraction, made according to the same method, and particularly with school objects, lumps, buttons and others. Graphic representation of numbers. - First exercises written numbers. Reproduction in digits of small calculations made orally. – Writing of numbers up to tens of thousands. - Multiplication of one-two digits in the multiplier. – Easy and repeated problems specifically formulated concerning matters of common life within reach of the children (PARÁ, 1890, p. 15 – 16).

For the **second year** in the same section, the description for the mathematical contents is as follows:

IV – Arithmetic. - Review of the first three operations. - Problems specifically formulated for each one of them. - Division by one and two digits. Problems. - Decimal and common fractions. - Repeated problems and concretely formulated problems with them (PARÁ, 1890, p. 16).

In the **third year** of this section, it is stipulated the following:

IV – Arithmetic. - Practical Exhibition of the decimal metric system. - Practical Exercises on each of the system measures. - Operations and calculations thereof. - Problems of practical life on the same system. - Conversion of old measures still in use into the modern ones and vice versa. - Proportions, rule of three and interest. – Practical notions on the mechanism of these different calculations. - Exercises repeated on each of them. - Concretely formulated Problems (PARÁ, 1890, p. 17).

**b) Popular school:** divided into Elementary Course, Middles Course and Advanced Course. Let's see what is there in the programs for these courses about mathematics.

First, the **elementary course**, point I, suggests the same guidance on use with Lessons of things, identically to the elementary schools in its three years. For Mathematics teaching the document reads as follows:

IV – First notions of calculations with the Calkins Method. – Count from 1 to 100. – Count of school objects or others, the number of students, the number of scribbles in the blackboard, etc. – First exercises of sum and subtraction done according to the same method and concretely with school objects, such as buttons, lumps, or others. – Graphic representation of numbers. – First exercises of written numbering. – Mental calculation. – First sums of unity to unity, then of unity to tens. – The same march to subtraction. Reproduction on digits of the small calculations made mentally. – Writing of numbers up to tens of thousands. Multiplication of one-two digits on the multiplier. – Easy and repeated problems concretely formulated about facts of common life within the reach of the children. – Division of up to two digits on the divider. – Calculations and easy problems about facts of the common order. (PARÁ, 1890, p. 19).

In the **middle course** of the popular school the Lessons of Things appear linked to the teaching of the kingdoms of nature, and the guidelines for teaching math recommend the following:

IV - Arithmetic. - Review of the second year of the elementary course program. - Mental Calculation on the fundamental operations of whole numbers. - General Idea about fractions. Common and decimal fractions. APPLICATION of the four operations to one or the other. – Decimal Metric System. – Main units of the system, their multiples and submultiples. - Problems and practical exercises. - Exercises of mental calculation applied to all these operations. - Reasons and proportions.  
Rule of three. - Simple Interest Rule. - Entirely practical solutions of problems on these theories and rules. (PARA, 1890, p. 20).

The first appearance of the geometry of study beyond the arithmetic that is common in other years or courses of both the *elementary schools* and the *popular school* is still in the middle course. "V – Practical Geometry. - The lines. - The polygons. - Constructions on the blackboard. - Measurement of the areas of polygons. - Practical examples. - School Room Measurement, backyard, etc." (PARÁ, 1890, p. 20).

In the **advanced course**, the Lessons of Things are linked to products of nature's kingdoms, especially to food. Regarding the teaching of mathematics we have:

III - Arithmetic. - Middle Course Review. - Repeated problems and calculations on the given subjects. - Square and square root. - Cube and cubic root. - Exercises. – Practical Notions of commercial bookkeeping. - Simple Fixtures and double entry. - Cash Book. - Ledger. – Daily Book. - Must and Have. - Practical Exercises on the cash book. - Launch and its practical formulas. – Checking accounts. - Exercises and commercial calculation problems.  
IV – Practical Geometry. – Study of Solids, division, naming and knowledge of solids. - Cubing. – Practical Measurement of areas and capacities. - Practical rudiments of trigonometry and surveying. (PARÁ, 1890, p. 22 - 23).



The *elementary school* classes lasted four hours, starting at 8h15 and ending at 11h, being divided into four periods of 45 minutes each. We highlight in **bold** the issues related to mathematics. The first 45 minutes of class were destined to the teaching of writing and **calculation**; The second, another 45 minutes dedicated to the mother tongue. After a 15 minute break, it restarted with the third class, with another 45 minutes destined to the **practical geometry and notions of measurements of areas and capacities**, being this time divided with geography. The last period, that is the final 45 minutes, was destined to

**Fig. 3** – Elementary course schedule

*ESCOLAS POPULARES*

Com os tres cursos, um só mestre ou uma só mestra

CURSO ELEMENTAR

*Das 7 <sup>3</sup>/<sub>4</sub> ás 8 — Inspeção dos alunos á entrada — Revista de  
aceio — Noções de hygiene e moral.*

> *8 ás 8 <sup>3</sup>/<sub>4</sub> — Leitura e Calculo.*

> *8 <sup>3</sup>/<sub>4</sub> ás 9 — Recreio.*

> *9 ás 9 <sup>3</sup>/<sub>4</sub> — Escrípta.*

> *9 <sup>3</sup>/<sub>4</sub> ás 10 — Recreio.*

> *10 ás 11 — Lingua materna: exercicios diversos de formação  
de frases e de escripta no quadro preto.*

*Das 3 ás 3 <sup>3</sup>/<sub>4</sub> — Escrípta.*

> *3 <sup>3</sup>/<sub>4</sub> ás 4 — Recreio.*

> *4 ás 5 — Lições de coisas.*

**Source:** The State of Pará Cultural Foundation, in the Rare Works Section of Arthur Vianna Library

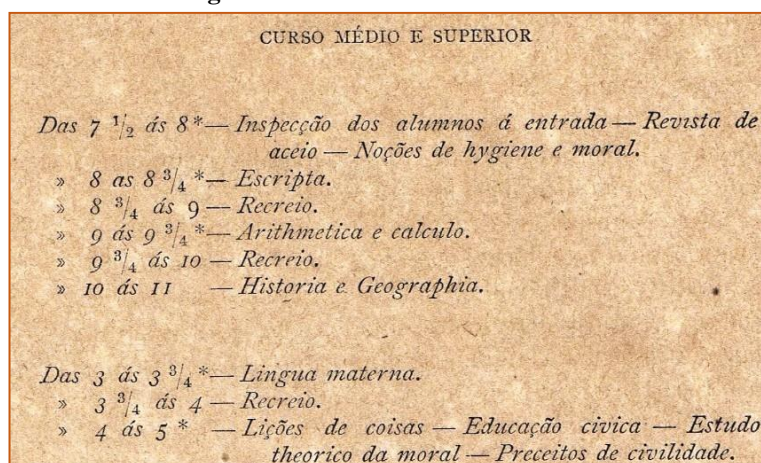
the "Lessons of things: **Concrete teaching of shapes, colors, numbers, dimensions, time, sounds, qualities of objects, measurements, their use and application.** - (twice a week.) **Calculation** - . (3 times a week)." (PARÁ, 1890, p 26) (emphasis added).

For the *popular schools*, which operated on three courses and only one teacher, the class times were thus stipulated. In the *elementary course* class began earlier, being divided into two shifts, morning - from 7:15 to 11am; afternoon, from 3pm to 5pm. Let us see below the schedule in the morning shift, described in the document fragment shown in Figure 3.

Regarding Mathematics we observed that in the elementary course only **calculation** appears in the second morning class and **lessons of things** in the last afternoon class. The middle and advanced courses were also divided into two shifts, morning and afternoon, represented in Figure 4.

We might observe that in regards to the teaching of mathematics we have **arithmetic and calculation** in the morning with a duration of 45 minutes, however, these classes were set on every day of the week (Monday to Saturday), as well as all the ones that are marked with asterisks in the figure above, which represent 4 hours and 30 minutes of class per week of such contents.

**Fig. 4** – Middle and advanced courses



**Source:** The State of Pará Cultural Foundation, in the Rare Works Section of Arthur Vianna Library

Moreover, the last section of the lesson on Tuesdays and Fridays (1 hour of class, that is, two hours per week) were reserved for **practical geometry** lessons (PARÁ, 1890, p. 28). We can observe that such a thing does not appear in the previous figure 4.

The section dedicated to **pedagogical instructions** started with a presentation by the General Director of Public Education of the State of Pará, José Veríssimo, who justifies and mentions clearly where he got the inspiration to write the document, source object of this article:

... I could not do better than to transfer to the use of primary teachers in Pará the *pedagogical directions and instructions*, with an aim identical to that drawn up in France, by one of the most eminent masters of contemporary pedagogy, mr. Gréard. (PARÁ, 1890, p. 31) (emphasis added).

Mr. Gréard, referred by José Veríssimo, is Otave Gréard (1828-1904), considered one of the most important architects of pedagogical systematization of primary education. His main concepts on education may be found in some publications such as: *Éducation et instruction*, from 1887; *L'Enseignement primaire à Paris et dans le département de la Seine* - from 1867 - 1877; *L'Enseignement de filles* – from 1882 and *L'Éducation des femmes* - 1887 (LELIÈVRE and DOMINIQUE, 1994). His key strategy in the educational process is the integral learning, that is an education with broader educational features on the multiple learning about the individual who learns (GRÉARD, 1887).

His pedagogical proposal, initially formulated in 1868 for the schools of Sena, became universal in 1882 when he prescribed that the undergraduate levels to be implemented in primary education should be materialized by means of three courses (elementary, secondary and advanced), just as it appears in the proposal of José Veríssimo for the popular schools in Pará, highlighting three fundamental principles of Gréard's pedagogical conception: a) essential principles for the classification of students; b) proposals for studies in each course; c) guidelines for the use of time - just as they are mentioned by Campagne (1886) and Giolitto (1983). These were precisely the guidelines on which José Veríssimo relied to prepare his document, which we describe in the following sections, referring to pedagogical instruction.



**I - Organization of the courses:** The key point concerns the measures taken by the Regulation: "organization of graduate courses, division of students according to their strength, determination of curricula, definition of school time, and establishment of primary school certificates". (PARÁ, 1890, p. 32), that is, strictly as Gréard predicts (1886).

**II - Students Rating:** At this point we emphasize the obligation of examination as a rating standard for all students, the aforementioned exam being about all the subjects comprehended in the course the student must complete.

**III - Teaching:** It is based preferably on "intuitive, heuristic, inventive or active methods" (PARÁ, 1890, p. 35). With regard to the teaching of mathematics, "the arithmetic will be mainly taught through calculation, making the child feel very soon what is its practical utility and importance" (PARÁ, 1890, p. 36). Other instructions are also given, such as the abolition of the habit of memorizing multiplication tables, which should be replaced by intuitive and heuristic processes, emphasis on mental calculation through concrete problems taken from students' everyday lives (PARÁ, 1890). Furthermore, practical and repetitive teaching, and time determined to lessons of things, which is conceived here as a method.

**IV - The programs:** should be obeyed strictly in the three courses, according to the way the teachers learned in their training at the Teaching School, going from simple to compound; from concrete to abstract; from example to rule; emphasize in the lessons more practical notions, short and well understood; simple and obvious arithmetic operations.

**V - The spirit of primary school:** The primary foundation of this point is stressed in the following sentence: "it is better to have no education than an incomplete one" (PARÁ, 1890, p 43); in other words, the instructions in this Regulation must be followed strictly obeying a systematic, logic distribution, with the use of active or intuitive methods.

On the **pedagogical literature**, the document presents a suggestion of some books on which the teacher might ground the pedagogical conception of this Regulation. Considering we have already presented comments on this point in the previous section, here we shall weave other considerations. We only emphasize that among these works appear *Lessons of Things* (CALKINS, 1886) and *Universal Dictionary of Education and Teaching* (CAMPAGNE, 1886).

Attached to the Regulation are presented *Decree No. 167 of July 23, 1890* – which marks the instructions of the High Council of Public Instruction, signed by Governor Justo Chermont, which regulates and approves this regulation; and the second document deals with *Guidelines on proficiency exams for elementary schools* – signed by the General Director of Public Education – José Veríssimo.

### **3. The authors and the books they published in the period (1860-1950)**

The first studies we carried out on the trajectories of mathematics in primary education (arithmetic, geometry and design) show us that these have benefited from a didactical

bibliographic production, which is quite significant for the context of Pará between 1860 and 1950, due to the books published from 1865 on, and their continuous reprints intended for the use of primary school teachers and teachers' schools, or trade schools of Pará, during the last decades of the nineteenth century and the first half of the twentieth century. In this section we will make a characterization of some of these books published in the period mentioned above.

According to Moreira (1979), most authors of books or textbooks of mathematics belonged to the faculty of two or more traditional schools of Pará, especially the Pará Lyceum (State School Paes de Carvalho) and the Normal School (Education Institute of Pará), two schools which greatly contributed to the formation of the intellectual mindset of Pará during the nineteenth and twentieth centuries.

We highlight here the work of Tito Cardoso de Oliveira, who lived in Pará in the first half of the twentieth century for 70 years, dying in 1960 in the capital, Belém. Besides being a teacher, Tito Cardoso served as the 3rd clerk of the Pernambuco Farm treasury for one year (1884 to 1885), with controversy surrounding the causes of his resignation (DIÁRIO DE PERNAMBUCO, 1885). In Pará he was an inspector of the municipal education (O PAIZ, 1913). Tito Cardoso de Oliveira authored Primary Geometry for the primary and commercial courses. In this work, the author points out that this book contains theoretical and practical geometry, graphical problems and points for exams. We had access to the 34th edition of the book, published by Companhia Editora Nacional, but the first edition of the book is from 1905, period in which the author was already living in Belém and served as Professor of the Practical Trade School of Pará.

A curious fact about the book is a critique on the concept of space as presented by Malba Tahan, in a newspaper column, writing that:

In the book titled Primary Geometry, by Prof. Tito Cardoso de Oliveira, we find this original definition (p. 10): "The space is infinite void where the bodies exist." Two concepts were included in this definition: "infinite void" and "body," which prof. Tito should have defined previously. Would it be possible to define or explain elementally the concept of "infinite void" without resorting to the notion of space? The professor must satisfy a definition before formulating it (TAHAN, 1956, p. 8).

The definition on page 10, to which Malba Tahan refers, corresponds to the one presented on page 11 of the 34th edition. Actually Tito Cardoso begins the first part of the book with notions of space, composition, length, volume and surface with an approach entirely based on examples of material objects, to support his plane geometry approach. There is, therefore, no clarification on such concepts, but examples which are intended to lead the student into understanding them in context.

Another book identified was the *Complementary Arithmetic for Primary, Complementary, Normal and Trade Courses*, (fig. 5) is characterized, according to the author himself, as a complete developed work containing also the necessary notions for solving small problems through algebraic equations and a large number of exercises and problems. In the period in which the book was prepared and published, its author was a Professor at the Pará Practical School of Trade, and author of other books such as Rudimentary Arithmetic, Primary

Geometry, Useful Multiplication Tables and the Collection of graduate exercises for elementary and complementary courses of the primary school. The issue that was referred to is the sixteenth edition, published by the bookstore and publishing house Porto de Oliveira & CIA, from Belém do Pará.

The book *Primary Arithmetic* (fig. 6), written by Cezar Pinheiro or Cezar Augusto de Andrade Pinheiro (his full name), born in Bragança, Pará (DIÁRIO DE BELÉM, 1885), had its first edition approved and adopted by the Pará Higher Council of Public Education in 1886 and its 2nd edition was published in 1902 by the Professor and Headmaster of the School Group José Veríssimo. According to Moreira (1979, p.41), the first edition of this book was the last school work of mathematics to be published in Pará during the empire; a small publication edited in 1887 by Taveira & Serra, a publisher from Pará. The author was a school teacher, who taught Arithmetic at the secondary course Santa Luzia School (DIÁRIO DE BELEM, 1887); he was a doctor, army colonel and politician, and several times mayor of the cities of Quatipuru and Bagre, both in Pará. He was also a journalist and editor of the news "O Cidadão", a weekly publication that circulated in Bragança between the years 1889 and 1892.

In 1884 Cezar Pinheiro opened a private school in the village of Muaná (which is currently a city) in Pará, where he was a public teacher (DIÁRIO DE BELÉM, 1884), (DIÁRIO DE BELÉM, 1888). For this reason, the president of the village's city council, Mr. Raymundo Benicio Pinheiro ordered him to close the aforementioned school for noncomplying with a law of the time which prohibited public school teachers of owning private schools and being teachers at the same time. However, as the demand was not met, the case was taken to the President of the Province and to the general director of public education (A CONSTITUIÇÃO, 1884).

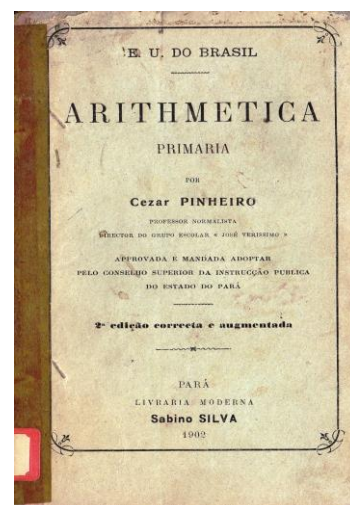
His book aimed only at primary education. We note that in the first edition cover there is a highlight stating that it is an *appropriate work for primary education schools, both effective and elementary*. The first part of the book refers to a presentation of the author himself, and the second part presents a documentation of its adoption and approval by the Pará Higher Council of Public Instruction. The third part properly presents the issues of mathematical nature according to the following description: I. Introduction (Conceptualization of various terms used in arithmetic); II. Fundamental Summation operations; Subtraction; Multiplication; Division; Potentiation or elevation to power; Root extraction or calculation of roots; Square root or cubic root; Fractions; Decimal Metric system; Complex numbers; Proportions; Rule of Three; Rule of Company; Rule of Interest; Progressions; The Meter's Relationship to old measures; Table of old units corresponding to the new

**Fig. 5 - Complementary Arithmetic**



**Source:** Moreira (1979)

**Fig. 6 - Primary Arithmetic**



**Source:** The State of Pará Cultural Foundation, in the Rare Works Section of Arthur Vianna Library

system; measures for liquids; Weights; Currencies. Note: Written in accordance with the spelling of the time.

Another publication of that time was the book *Metric Rules or Indispensable Precepts...* (fig. 7), authored by Jeronymo José d'Oliveira, which, according to its author, was expressly designed to be used in primary school – Infância Paraense and offered to the children of artists, workers, and craftsmen in the states of Pará and Amazonas. Jeronymo José d'Oliveira was a secular priest of the clergy in Pará and school headmaster. He completed his studies in seminaries in Europe (A CONSTITUIÇÃO, 1881) and was an acting professor of sacred history of the Episcopal seminary in Pará (GAZETA NEWS, 1881) and of the Our Lady of Mount Carmel Seminary (ALMANAK PARAENSE, 1883), a religious school still operating today. He used to give private lessons in Latin, French and Portuguese, at his residence (DIÁRIO DE NOTÍCIAS, 1886).

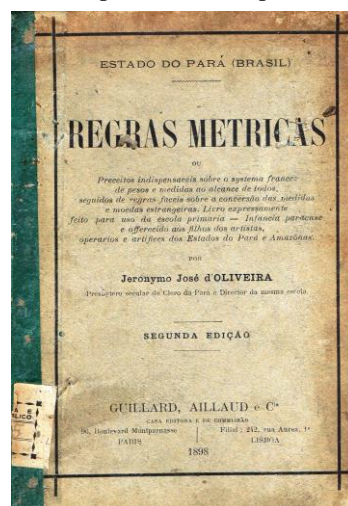
The book is organized according to the following description: Preface; I - Part I: Chapter I: On the origin of the meter; Chapter II: on the magnitude or amount; Chapter III: On the linear meter; Chapter IV: On the square meter; Chapter V: On the are; Chapter VI: On the cubic meter; Chapter VII: On the stereo; Chapter VIII: On the liter; Chapter IX: On the gram; Chapter X: On the franc; II - Part One: Chapter I: On the exchange; Chapter II: Continued; Chapter III: On the British currency; Chapter IV: Conversion of old measures into their equivalent in the decimal metric system and vice versa; Chapter V: Metric Equivalence of old measurements; Table of Contents.

The book *Arithmetica for the use of basic education schools in the province of Pará*, authored by Antônio Joaquim de Oliveira Campos, was published in 1889. That book aimed to meet the primary education of Pará. The issue was under the responsibility of the publisher Tavares Cardoso. Its author was a geographer engineer, bachelor in mathematical and physical sciences by the central school of the Brazilian Empire. He was a professor of Arithmetic, Algebra and Geometry of the School of the Holy Innocents, and Sant'Anna boarding school in Belém, in the period during which he prepared and published the book. In a letter dated October 28, 1872, addressed to the President of the Province, the General Director of Public Instruction communicated that the aforementioned compendium was considered "the best among the approved", for which he proposed a prize to the author, as an aid to print the work (MOREIRA, 1979, p. 40).

The compendium had enough impact, being sold in the city's bookstores, according to the ad in the newspaper Diário de Belém (1886).

He was an engineer, retired director of Public Works in the State of Pará (PARÁ, 1901). His work has had repercussions in the local press where the editor of a newspaper published at the time: "In our opinion, the arithmetic compendium composed by the industrious Mr. Campos is dedicated to public education, and is to fulfill the educational deficiency of which other compendiums used in schools suffer" (O SANTO OFÍCIO, s / d,

**Fig. 7 -** Metric Rules or Indispensable Precepts...



**Source:** The State of Pará Cultural Foundation, in the Rare Works Section of Arthur Vianna Library

p. 3). He was an arithmetic substitute teacher at the Collegio Santa Maria de Belém (ALMANACH ADMINISTRATIVO, 1873).

A curious fact is that, on one occasion, Dr. Campos (as he was known), offered to teach mathematics for free to students of the night school (O LIBERAL DO PARÁ, 1871).

Another publication of the period was the notebook *Practical Lessons and Easy Methods to be applied to the teaching of Arithmetic in primary schools*, authored by the teacher Francisco da Silva Nunes, who also acted as a professor at the Gymnasium Paes de Carvalho, and who taught Eidorfe Moreira (Moreira, 1979). Moreover, he acted as head of theoretical education of the Institute Lauro Sodré (PARÁ, 1927). According to the author, the book was intended for students of the 4th elementary year. The book was published by the Institute Lauro Sodré's graphical workshops, a professional training school of Pará in the year 1929, which owned a printing press within the school itself. The author was the father of governor Alacid Nunes da Silva - a Brazilian military man and politician who twice ruled the state during the military dictatorship.

One of the books destined to the teaching of geometry was *Practical Geometry or Linear Design for the students of the model course at the Teaching School of Pará*, authored by J. de Brito Bastos, in 1898, edited by JB dos Santos, by Commercial Publisher and Library, from Pará. On the title page the author points out that the work had been approved and adopted in the public schools by the Higher Council of Public Instruction. That compendium earned the author a gratification from the State Treasury for its publication (DIÁRIO DE NOTÍCIAS, 1896).

José de Brito Bastos was headmaster of Santareno Lyceum (Santarém - Pará - Brazil) and in 1896 he was transferred to the city of Bragança (CIDADE DE BRAGANÇA, 1896). He was also professor of algebra and geometry of the Institute Lauro Sodré (O PARÁ, 1898) and professor of algebra and geometry of Institute Paraense (FOLHA DO NORTE, 1897). He was a musician and gave private lessons following the method of the Vienna Conservatory (Austria) (O LIBERAL DO PARÁ, 1888) and used to promote concerts with his students (O LIBERAL DO PARÁ, 1889). In 1892 the teacher was appointed on an interim basis for the chair of linear design at the Teaching School (DIÁRIO DE NOTÍCIAS, 1892), and remained in the position until 1894, with the arrival, in Belém, of Professor Pierre Maurice Blase, who was hired in Paris to take up the position (DIÁRIO DE NOTÍCIAS, 1894).

Still on geometry, another book prepared and published in Pará was *Geometric Rules*, written by Jeronymo José de Oliveira. According to its author, the book had all the necessary norms to enable the students to learn to measure lines, surfaces and volumes of bodies, expressly organized for the use of primary final school and secondary initial school, which he called Pará childhood. On the title page there is a highlight about the author, calling him a "Secular Priest of the Clergy of Pará." We had access to the 2nd edition of that book, edited by Guillard, Aillaud & Co., to the Publishing and Commission House, from Pará, published in 1898 in Pará. At that time, the editors had their publishing houses in Paris and Lisbon; which is highlighted in the book's title page.

Following with a related theme, the book *Geometric Linear Design*, intended for design in the primary education of Pará, was written by Maurice Blaise, a drawing teacher at the



Pará Teaching School, at the Institute Lauro Sodré and at the Gimnasio Paes de Carvalho. Maurice Blase, a Frenchman, arrived in Belém in 1894, invited to come to Pará to develop some professional activities as a draftsman. This invitation contributed for his setting up residence in Belém and taking up teaching as linear design professor at the Lyceum Paraense and the Teaching School. The book was published in 1904 by the publisher Aillaud & Co.

Besides being a teacher at these schools, Maurice Blase organized a special drawing course, which operated at night twice a week, on Mondays and Thursdays from 7pm to 9pm, where he worked a theoretical and one practical part, being the same adopted in the professional or preparatory schools of the National and Special Fine Arts School of Paris (FOLHA DO NORTE, 1896). In addition, Maurice Blase brought materials from Europe such as plaster models for topographic drawing class, for which purchase he was paid by the state (FOLHA DO NORTE, 1896). In his initial employment contract as a teacher in Belém there was a clause that guaranteed him a sum of one thousand francs for his return to France, which was excluded at a later contract (FOLHA DO NORTE, 1896). The teacher went constantly to Europe, including for holidays.

Maurice Blase was strongly linked to the arts in Pará, even going so far as to draw the Coat of Arms of the city of Belém, which is still in use, and is also attributed to him a portrait of Steward Gama Abreu, known as Baron of Marajó. He also provided several art exhibitions along with his wife, also an artist, Louise Larrière Blase and other artists of the land.

The book *Usual Problems in Geometric Linear Design*, published under the coordination of Theodoro Braga, from an adjustment made at the School Pedro II, and published in 1930 by publisher São Paulo Ltda., was dedicated to the students of the primary, secondary, technical-professional, teaching and artistic courses. Early on, in the first few pages, the coordinator explains that the requirements arising from the necessity of better understanding the study of the usual problems of geometric linear design imposed the publication of the book, its author not knowing another work which, at that time, assembled a greater number of problems and which, therefore, might have satisfied those increasingly indispensable requirements.

Theodoro Braga, besides being a professor, was headmaster of the Institute Lauro Sodré. He was also a painter, an educator, a historian, a writer, a geographer and a lawyer. In 1899, he won the coveted Travel Abroad Award, given annually to the author of the best work exposed at the National Salon of Fine Arts, organized by the institution. He spent most of his European stay in Paris, where he was pupil, at the Julian Academy, of Jean-Paul Laurens, a link which is made evident in Teodoro's perennial interest for historical and literary themes in painting. Moreover, he was a character of great importance in the artistic panorama of Pará, as a scholar who engaged in activities related to teaching and art critique. He devoted himself to the research of themes in the regional history and culture, particularly of the so defined "Marajoara art", transposing them to painting, to the decorative arts and architecture. He also had an outstanding performance in São Paulo, where he taught at the School of Fine Arts, of which he was headmaster.

#### 4. Conclusion

According to the following questions proposed at the beginning of this article: *what did these teaching programs prescribe concerning the teaching of mathematics? What are the pedagogical conceptions underlying the mathematics teaching process in primary schools of the state of Pará ?*, we can see that, in Pará, even before the reform of primary education made by Benjamin Constant through Decree n. 981 of November 8, 1890, we already had this concern, as might be seen in the Decree of Justo Chermont, *General Regulation of Public and Special instruction in the Primary Education of Pará - 1890*, however, a few months before Benjamin Constant's decree, and which gave rise to the main document of our analysis: *Primary Education: school regulation, programs, time and pedagogical instruction for public schools in the State of Pará - 1890*.

In the source document, we see that the teaching of mathematics in Pará was prescribed by official regulations on subjects such as: arithmetic and calculation, its first notions; exercises of addition and subtraction; multiplication of one and two digits in the multiplier; problems of easy solutions; decimal and common fractions; practical exposure of the decimal metric system; proportions, rule of three and interest; in the middle course we see practical geometry; in the advanced course we have square and square root; cube and cubic roots; besides notions of bookkeeping practices and practical rudiments of trigonometry and surveying.

We emphasize, however, that the practical notions of bookkeeping justified itself at this level of education due to the fact that Pará was in that period (late nineteenth century) a place where an important trade school of Brazil was created and maintained due to the arrival of Syrian, Lebanese, Turkish, and Jewish merchants, who began to explore the negotiation of the harvesting of natural products from the region, aiming to export to Europe. Also, the coming of farmers and rural workers from the Northeast of Brazil to the Amazon, in the same period, gave rise to the need of inserting surveying studies because of the redistribution of lands for planting and harvesting of the rubber tree sap in the region.

With respect to the pedagogical conceptions present in the teaching of mathematics, our second question, we testify that they are based on the thoughts of Gréard (1886) based on the Calkins method (1886), following a systematic distribution, logic, employing active or intuitive methods. Thus we see that, in its school organization, there is a strong influence of positivist philosophy.

Therefore, in Pará, at this time, primary education was pedagogically planned and organized according to the proposals for primary schools conceived in France, for the authorities considered that the need for a scientific basis for the development of education could lead Brazilian scholars to appropriate the ideas arising from the French intellectuality and thus would value relevant and meaningful ideas to be implemented in this teaching.

It is precisely this mindset that is present in the proposals of José Veríssimo for primary education in Pará, in that period, with strong influences of French education, since ideas and pedagogical conceptions of that country were incorporated into the education and culture of Pará, which created an interest in the translation of many books by French

authors, which were absorbed by the scholars of the region as well as from other parts of Brazil.

With regards to publications on school mathematics, some experts on the editorial trajectory of textbooks in Pará between the end of the nineteenth and first half of the twentieth century, it is possible to ensure that the exploration and appreciation of the latex obtained from the rubber tree for the production of rubber had a strong influence in developing a school literature, in a context very much afforded by the financial policies of the time, as well as by the spread of many European educational ideals, especially those innovative ones arising from the French society and education of the second half of the nineteenth century. Only after the crisis of the exploitation of latex, we can see also the disincentive to the local publishing of works produced in the region itself by local educators, which caused the increase in imports of textbooks from the Southeast and South of Brazil.

Our reflections point out, moreover, that most books published in Belém (Pará - Brazil) in that period, came from the action of Portuguese booksellers and publishers who settled in Pará during the period and created a publishing infrastructure so that the publications could materialize. The arithmetic, geometry and design books reflect very well the authorial and editorial fertility of the region in the period, since the number of published works was quantitatively satisfactory, and qualitatively met the educational interests of the moment, since the authors were also educators and trainers of teachers in the teaching school and in the lyceums that existed in the region during that period.

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