

Köbel, Eyn new geord(n)et vysirbüch, 1515

Jabir ibn Aflah (fl. early 12th century)

Accedunt iis Gebri filii Affla Hispalensis astronomi uetustissimi pariter & peritissimi, libri IX de astronomia, ante aliquot secula Arabice scripti, & per Girardum Cremonensem latinitate donati, nunc vero omniu[m] primum in lucem editi.

b/w: **Apian, Peter** Instrumentum primi mobilis, à Petro Apiano nunc primum et inventum et in lucem editum ...

Year: 1534 Place: Nürnberg

Publisher: Johann Petreius

Edition: 1st Language: Latin

Figures: title in red and black

Binding: modern half leather binding over buckram boards

Pagination: pp. [80], 146

Collation: a-k⁴aa-rr⁴ss⁶(-SS6 blank, deleted by binder)

Size: .316x204 mm

Reference: Van O, #107; Zin *GBAL*, #1553; Ada *CBCE*, A-1292

Jabir ibn Aflah is known in the West as *Geber*, the Latinized version of his name.

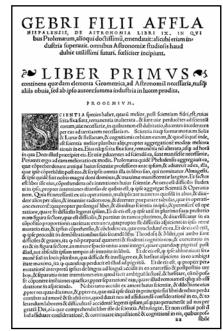
The Islah of Jabir ibn Aflah is a revised, amended and critically edited version of Ptolemy's *Almagest*. Gerard of Cremona translated the text into Latin from a manuscript revised by Maimonides in Seville in the second half of the twelfth century. The work is a theoretical treatment and served as an important resource in the spread of spherical trigonometry to the non-Arabic world. On several occasions **Cardano** expressed his suspicion that **Regiomontanus** plagiarized the entire fourth book of Jabir for use in his *De Triangulus*. This is the first printing of Gerard of Cremona's translation and is the larger of the two texts.

In his original Arabic treatise, Jabir describes an instrument similar to the torquetum. In this Latin version a slightly different device is described, but using Jabir's original diagrams. For information on the torquetum, see

entries for **Danti, Egnatio**; *Primo volume dell' uso et fabbrica dell' astrolabio* and **Rohde-Hamburg, Alfred**; *Die geschichte der wissenschaftlichen instrumente.*

See entry for **Apian**, **Peter**; *Instrumentum primi mobilis* for illustration of the title page of this volume.

Illustrations available: First page



First page, J 1

J 2

Jackson, Lowis d'Aguilar

Accented four-figure logarithms, and other tables for arithmetical and trigonometrical purposes, and for correcting altitudes and lunar distances with formulæ and examples

Year: 1881 Place: London Publisher: W. H. Allen Edition: 1st

Language: English

Binding: original green cloth boards; gilt spine

Pagination: pp. [iv], xl, 245, [3] Collation: $\pi^6b-e^4B-I^4J-2H^4$ Size: 200x130 mm

Reference: Hend BTM, #183, p. 142

In this set of logarithms accents and diamond-shaped periods are placed after the last digit to indicate whether it has been rounded up or down to achieve the tabular value. In many cases the rounding of a logarithmic value will have little effect on a calculation, but it can be serious in certain situations. For example, the logarithms of 8891, 8892 and 8893 all equal 3.9490 (when rounded to four

decimal places), and thus the use of the simple four-place logarithm introduces errors into the final result. If the calculator could keep track of which logarithms had been rounded up and which down, it might add significantly to the accuracy of any calculation. In these tables an accent indicates that the logarithm has been rounded up and a diamond period means it has been rounded down. The calculator compensates for the rounding by adjusting the rules of addition and subtraction for the last figure.

Illustrations available: Title page Arithmetic rules Sample table page

ACCENTED					
FOUR-FIGURE LOGARITHMS,					
AND OTHER TABLES,					
FOR					
ARITHMETICAL AND TRIGONOMETRICAL PURPOSES, AND FOR CORRECTING ALTITUDES AND LUNAR DISTANCES,					
WITH					
FORMULÆ AND EXAMPLES,					
ARRANGED AND ACCENTED BY					
LOWIS D'A. JACKSON,					
AUTHOR OF "HYDRAULIC MANUAL AND STATISTICS," "AID TO SURVEY-PRACTICE," AND OTHER WORKS.					
LONDON: W. H. ALLEN & CO., 13, WATERLOO PLACE. PURLISHERS TO THE INDIA OFFICE. 1881.					
(All rights reserved.)					

N	0	1	2	3
730	·86 ₃₃ .	·8634 \	·8634 .	·8635
731	.8639	·8640 \	.8640	.8641
732	.8645	.8646	.8646	·8647
733	·8651	.8652	.8652	·8653
734	.8657	·8658 \	·8658 _•	·8659 \
735	·8663 \	.8663	.8664	·8665 \
736	·8669 >	.8669	.8670	.8671
737	·8675 `	.8675	·8676 \	.8676
738	·8681	.8981	·8682	
739	·8686	.8687	·8688 >	·8688

Rounding marks, J 2

J 2

J 3

Jacob, Louis Frederic Gustave (1857–)

Le calcul méchanique. Appareils arithmétiques et algébriques intégrateurs

Year: 1911 Place: Paris

Publisher: Octave Doin et Fils

Edition: 1st Language: French Figures: 184 figures in text

Binding: original cloth boards; stamped covers in brown and

black

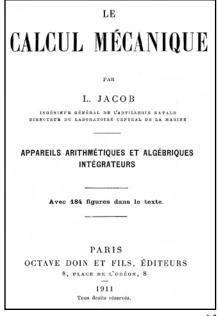
Pagination: pp. xvi, 412, xii Collation: *81¹²*16-11¹²*11612¹²*12²

Size: 178x117 mm

Reference: Ran ODC, p. 423

Jacob was an expert in naval gunnery and director of the French naval laboratory—both positions would have involved him in computation.

As the twentieth century got under way, the increasing demand for business and scientific calculation created an associated demand for information on the machines and devices available for the task. In Britain, that need was satisfied by the publication of the *Napier Handbook* (Horsburgh, Ellice Martin; *Handbook of the exhibition*, 1914). In Germany, it was provided by the works of Ernst Martin (Martin, Ernst; *Die Rechenmaschinen*, 1925). This volume is the equivalent for France. It discusses all forms of calculating machines from the time of Pascal onward. Many diagrams explain the inner workings of the machines and analog instruments. The work is a good reference in that, unlike *Die rechenmaschinen* of



J 3

Ernst Martin, it treats not only the standard commercial machines such as Brunsvigas, etc., but also the lesser-known machines developed by **Babbage**, Kelvin, **Torres y Quevedo**, Weiberg, Tchebichef (**Chebyshev**), etc. It presents a comprehensive view of the state of the art just prior to the World War I.

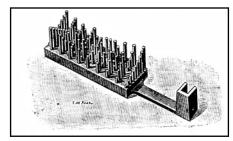
This work was originally part of a series of publications forming *Encyclopédie Scientifique*. Various sections of the project were under the direction of experts in the field, and this volume appeared in the applied mathematics section directed by **Maurice d'Ocagne**. **D'Ocagne** was himself an expert in methods of calculation.

A second copy of this work is in the collection.

Illustrations available:

Title page

Mechanical version of Napier's bones used in the Bollée machine



Bollée's version of Napier's bones, J 3

J 4

Jacob von Coburg, Simon (1510?–1564)

Ein New und Wohl gegrundt Rechenbuch, auff den Linien un[d] Ziffern, sampt der Welschen Practic und allerley vortheilen, neben der extraction Radicum, un[d] von den Proportionen, mit vilen lustigen Fragen und Auffgaben &c.

Year: 1565

Place: Frankfurt

Publisher: Simon Georg Raben für Sigmundt Feyerabend und

Simon Huter

Edition: 1st Language: German

Figures: Title page in red and black

Binding: contemporary embossed leather with clasps

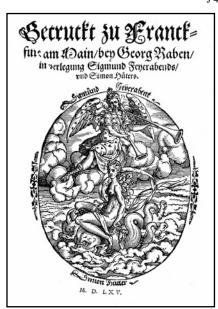
Pagination: ff. [12], [349], [1] Collation: a-c⁴A-3S⁴3T² Size: 200x156 mm.

Reference: Geb COSS, pp. 151-167

Simon Jacob was a famous German *rechenmeister*. He had published earlier arithmetic books—one of which is in this collection. He died in 1564, and his brother Pancras Jacob von Coburg inherited his books and instruments. This volume, while based on Simon's earlier work, was heavily edited by Pancras. Pancras was obviously attempting to capitalize on his brother's reputation. It



Ι/Ι



Colophon and printer's mark, J 4

is not often that, as here in the introductory material, one can read the author's obituary. **Smith** (*History of mathematics*) suggests that **Joost Bürgi** mentions Simon Jacob's treatment of series and that this, and other works like it, led him to his independent invention of logarithms.

This arithmetic book is less commercially oriented than are earlier **Jacob** works. Although the title implies that the book will deal with both the table abacus (auff den Linien) and algorism (un Ziffern), the table abacus is only briefly mentioned, with no illustrations, before the work turns to the elementary operations and then to

more advanced topics such as arithmetic progressions, areas, volumes, etc. The title page shows a number of figures using quadrants, Jacob's staffs, etc. The colophon includes an unusual ornate printer's mark.

Illustrations available: Title page (color) Colophon Volume illustration



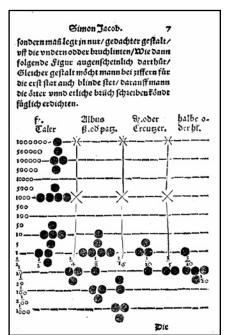


Table abacus with fractions, J 5

J 5

Jacob von Coburg, Simon (ca.1510–1564)

Rechenbuch auff den Linien und mit Ziffern, Sampt allerlei Vorteylen, Jetzo von newem und zum andern mal mit vielen gründlichen anweisungen, oder Demonstrationen unnd schönen fragen, sampt derselbenen underrichtung, gemehrt, Der gestalt vormals nit gedruckt, Mit fleiss Corrigirt und zusammen getragen

Year: 1559 Place: Frankfurt

Publisher: Heirs of Christian Egenolff

Edition: 2nd Language: German

Binding: modern half-bound vellum

Pagination: ff. [12], [167] Collation: f^8 ff^4 A–V⁸X⁷ Size: 156x99 mm

Reference: Geb COSS, pp. 151-167

This is a German arithmetic in the tradition of those of **Adam Riese** (*Rechnung auff der Linien*, 1542). It begins with arithmetic operations in which examples of each are given in both abacus and algorism notation. The first illustration of an abacus is of note because it shows fractions as well as the usual integers. The last section is devoted to tables of multiplication and currency.

Illustrations available: Title page Table abacus Colophon

J 6

Jacobi, Carl Gustav Jacob (1804–1851)

Canon arithmeticus sive tabulae quibus exhibentur pro singulis numeris primis vel primorium potestatibus infra 1000 numeri ad datos indices et indices ad datos numeros pertinentes.

Year: 1839 Place: Berlin

Publisher: Typis Academicis

Edition: 1st Language: Latin

Binding: uncut; original paper wrappers

Pagination: pp. xl, 248 Collation: a*4b-e41-314 Size: 279x223 mm.

Reference: DSB VII, pp. 50-55

Carl Jacobi was born in Potsdam, Germany, into a prosperous family of German-Jewish bankers. He exhibited his aptitude for mathematics at an early age and was intellectually prepared to enter university by the age of twelve. However, to conform to the admission

Jacquard, Joseph Marie

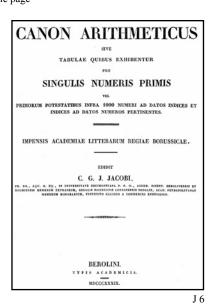
policies of the University of Berlin, he was forced to delay his matriculation until he was sixteen.

Jacobi soon found that the University of Berlin curriculum did not offer sufficient courses in higher-level mathematics to satisfy his growing sophistication. He was forced to educate himself by reading the works of Euler, Gauss and other leading mathematicians.

Jacobi eventually earned a reputation as one of the greatest mathematicians of the nineteenth century and was a major participant in the reform and revival of higher mathematics education at German universities. He spent eighteen years teaching at the University of Königsberg before returning to the University of Berlin. He is best known for his work in elliptic functions, but also worked in many other areas of mathematics. He was a prolific publisher in *Crelle's Journal* but, other than various collected volumes of his papers, this is the only publication he produced in book form.

This work is a set of tables useful in the new field of number theory. It begins with a small table giving the period in which the decimal fraction 1/p repeats itself for primes where $p \le 9901$. This is followed by an essay on the construction and use of the other tables in the work, all of which involve relationships of prime numbers.

Illustrations available: Title page



[Jacquard, Joseph Marie]

See **Biehler**, **Tobias**; *Practische anleitung für jede zeichnung zur Jaquard-Maschine I*, 1839.

See **Bell, T. F.**; *Jacquard weaving and designing*, 1895. See **Kohl, Friedrich**; *Geschichte der Jaquard-*

maschine und der sich ihr anschliessenden.

abänderungen und verbesserungen. Nebst der biographie Jacquard's. 1873

See Hervier, Jean; Henry, J. A. and Roux, A.; Livre de prières. Tissé, d'après les enluminures des manuscrits du XIVe au XVIe siécle, 1886–1887.

See Grognier, Louis Furcy; Notice sur C. M. Jacquard.

See Hedde, Phillipe; Notes complémentaires au mémoire présenté par M. Ph. Hedde, membre de l'academi du Gard, ancien fabricant de rubans à St. Etienne et professeur de tissage, directeur du conservatoire des arts et metiers et du Musee industriel de St. Etienne au congrés scientifique (24th session) 3 Septembre 1857 à Grenoble en faveur de Vaucanson.

See **Hedde, Phillipe**; Revendication en faveur de Vaucanson de Grenoble de l'honneur de l'invention du mécanisme qui porte aujourd'hui le nom Jacquard de Lyon.

See **Woodhouse**, **Thomas**; *Jacquards and harnesses*. *Card-cutting, lacing and repeating mechanism*.

J 7

Jacquinot, Dominique (16th century) and **Jacques Bassentin** (ca.1500–1568)

L'usage de l'astrolabe, avec un petit traicté de la sphere ... Plus est adiousté une amplification de l'usage de l'astrolabe, par Jacques Bassentin Escossis.

Year: 1573 Place: Paris

Publisher: Jerome de Marnef & Guillaume Cavellat

Edition: 3rd Language: French

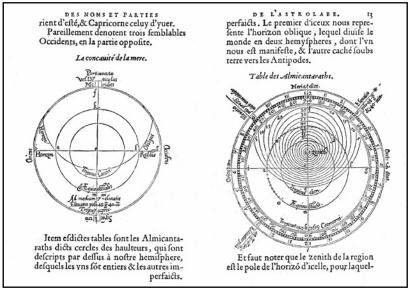
Binding: contemporary limp vellum

Pagination: ff. [8],100 Collation: A–N⁸O⁴ Size: 165x108 mm Reference: Cro *CL*, #73, p. 81

Little is known of Dominique Jacquinot, the primary author of this work. Jacques Bassentin was a Scott who, after studying at Glasgow University, traveled in Europe and settled in Paris, becoming a teacher of mathematics. He eventually returned to Scotland in 1562.

This work, evidently the first on the astrolabe in French, was first published in 1545 without the additional work by Bassentin. It begins with a brief description of the sphere and the usual circles of the equator, tropics, etc. The rest of the Jacquinot text is devoted to a detailed description of the astrolabe, with each piece being illustrated and its use in astronomy and surveying explained. An illustration on folio 67 verso shows a ruler that, although having the hinged form of a sector, is not





Astrolabe diagrams, J 7

capable of being used as one because the scales do not emanate from the hinge—it would be another quarter century before the sector was in use.

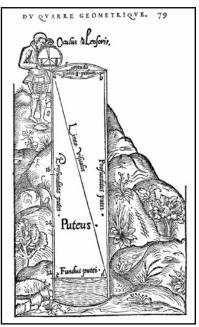
The Bassentin work was added in the second edition of 1558. The text (from folio 79 verso on) had first appeared as his version of Jacques Focard's *Paraphrase de l'astrolabe*, Lyon, 1555. It describes how to use the astrolabe for sighting stars in order to determine geographical location. It closes with a repetition of a simple surveying problem already covered in the Jacquinot text.

Illustrations available: Title page Parts of the astrolabe

Finding depth of a well Printer's mark



Printer's mark, J 7



Surveying a well, J 7

J 8 **Jaderin, Edvard** (1852–1923)

Tables abrégées pour le calcul des logarithmes vulgaires à 12 decimales

Year: 1914 Place: Stockholm

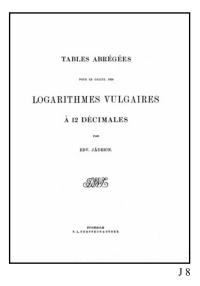
Publisher: P. A. Norstedt & Söner

Edition: 1st Language: French

Binding: original paper wrappers

Pagination: pp. 21 Size: 275x217 mm This table contains the twelve-digit logarithms of numbers from 101 to 999. At first sight, this may seem to be not very useful, but it does have the advantage of presenting twelve-digit logarithms in a compact form—logarithms for numbers other than those in the table could be calculated from formulae supplied at the bottom of each page.

Illustrations available: Title page First page of table



J 9

James, Hubert Maxwell (1906-); Nathaniel B. Nichols (1913-) and Ralph Saul Phillips

Theory of servomechanisms

Year: 1947 Place: New York Publisher: McGraw-Hill Edition: 1st Language: English Binding: original cloth boards

Pagination: pp. xiv, 375 Size: 228x150 mm

Little is known about the authors other than that James was a professor of physics at Perdue, Nichols was director of research at the Taylor Instrument Co., and Phillips was a professor of mathematics at the University of Southern California.

This is volume 25 of the MIT Radiation Laboratory Series, a legacy of the work done there during World War II. It is a reasonable assumption that the authors were staff members at the Radiation Laboratory during World War II. This is a highly technical treatment of servomechanisms and cybernetics.

Illustrations available: Title page

J 10

Jean, Alexandre (fl.1637)

Arithmetique au miroir. Par laquelle on peut (en quatre vaccations de demye-heure chacune) practiquer les plus belles regles d'Icelle

Year: 1636 Place: [Paris] Publisher: n/p Edition: 1st Language: French

Figures: all printed pages are engraved

Binding: contemporary vellum; 8 blank leaves at front

Pagination: pp. [1], 55, 18 Size: 158x110 mm

This completely engraved work is in two parts. The first part is a ready reckoner for the price of goods in multiples (from 1 to 20,000), and the second is a similar table for fractional amounts (if one unit costs 8 francs, then a half will cost 4 francs, etc.). Part 1 has an engraved title page bearing the date 1636, with the colophon dated 1637. There are also a few small tables of other items (squares etc.). All the tables are nicely engraved, and many show the figures in what appear to be apothecary jars, palm leaves, etc. It is possible that the tables in part 2 actually represent the value of various measures of cloth as their heading (Fractions de Laune) can be interpreted as La'une (one) or L'aune (ells—of cloth).

Illustrations available: Title page

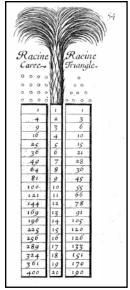
Table sample from part 1

Table of squares

Colophon from part 1 and table from part 2



J 10



Sample table, J 10

Jean, Alexandre

Arithmetique au miroir. Par laquelle on peut (en quatre vaccations de demie-heure chacune) practiquer les plus belles regles d'icelle.

Year: 1649 Place: [Paris] Publisher: n/p Edition: 2nd Language: French

Figures: Part 2&3 - all printed pages are engraved

Binding: contemporary vellum Pagination: pp. 15, [1]; [1], 55; 18

Size: 157x103 mm.

Reference: Hymn IV, 1756; Ken #2596

In this second edition of the ready reckoner, a letterpress title page and introduction have been added to the engraved tables. The original engraved title page remains bound in after the introductory material.

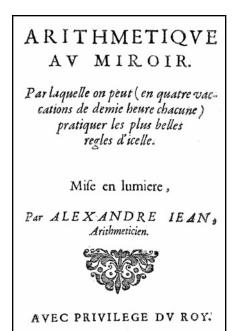
Illustrations available: Title page

Jeffress, **Lloyd A.**, editor

See **von Neumann, John Louis**; "The general and logical theory of automata." In *Cerebral mechanisms in behavior—The Hixon symposium*.

Jerwood, James

See Judex Juris [pseud]; On the calculation and printing of mathematical tables by machinery; the inventor and his treatment. In Works of Charles Babbage [Collection of seventeen items by or about Babbage bound in 1 volume].



J 11

J 12

Jevons, William Stanley (1835–1882)

Elementary lessons in logic: deductive and inductive with copious questions and examples, and a vocabulary of logical terms.

M. DC. XXXXIX.

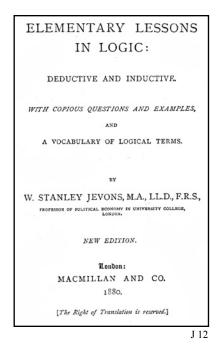
Year: 1880 Place: London Publisher: Macmillan Edition: 2nd Language: English

Binding: original red leather boards; spine gilt

Pagination: pp. xii, 340, 56 Collation: $\pi^61-21^822^2a-c^8d^4$ Size: 163x102 mm

Jevons, the ninth of eleven children, was born into the family of an iron merchant. His parents were Unitarian, an influence that appears in his later writings. He showed unusual abilities while still an undergraduate at University College, London. When only eighteen and still an undergraduate, his family having fallen into financial difficulties, he accepted the position of assayer at the new Australian mint. During the five years he spent in Australia, Jevons became interested in meteorology, geology and political economy. These interests in turn heightened his interest in economics, a subject in which he was entirely self-taught. When he returned to England to once again take up his studies, they were in economics, philosophy and mathematics.

Upon his graduation in 1863, Jevons received an appointment as a tutor at Owens College, the forerunner



of Manchester University. He was a poor lecturer, and after two years he left for an academic position at Queens College in Liverpool. He returned to Manchester after only one year in Liverpool to a dual chair of Political Economy and Logic and Mental and Moral Philosophy. Jevons remained in Manchester until 1876, when he moved to University College in London. His time in Manchester had been quite productive. He published *Pure logic* in 1864, developed the *logical piano* in 1870, and published *The theory of political economy* in 1871.

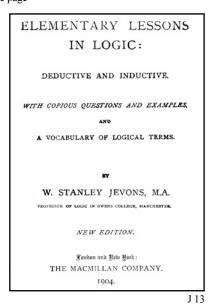
Jevons had left Manchester with the understanding that the new post in London would require less public speaking. To the contrary, he found that the London chair required him to speak in public more often—something he came to dislike greatly. Four years later he resigned to spend his full time writing. He was plagued by ill health and, aged forty-six, drowned while swimming in the sea, most likely as a result of a heart attack or stroke.

Economics and logic were in tight association in English universities, and while Jevons made significant contributions to the early study of economics, he is known today for his texts in logic and for the invention of a machine used to demonstrate logical principles to his students. See the entry **Macrosty and Bonar**, *Annals of the Royal Statistical Society*, 1934, for a portrait of Jevons

Jevons was dissatisfied with the development of logic by **George Boole**, particularly the mathematical basis with which **Boole** tried to formalize the subject. He wrote this elementary textbook in logic to provide a different

treatment for beginning students. It was a very successful effort and remained in print for over one hundred years. While the treatment is rigorous, it is devoid of the mathematical language that many students found intimidating. In modern parlance the Jevons approach might be referred to as informal logic.

Illustrations available: Title page



J 13

Jevons, William Stanley (1835–1882)

Elementary lessons in logic: deductive and inductive with copious questions and examples, and a vocabulary of logical terms.

Year: 1904 Place: London Publisher: Macmillan Edition: new Language: English

Binding: original cloth boards; spine gilt

Pagination: pp. xii, 340, 8 Collation: $\pi^61-21^822^2\delta^4$ Size: 171x115 mm

This *new edition* appears identical to the first, with the exception of a reset title page.

Illustrations available: Title page

J 14

Jevons, William Stanley (1835–1882)

On a general system of numerically definite reasoning. [From the fourth volume of the third series of "Memoirs of the Literary and Philosophical Society of Manchester." Session 1869–70.]

Year: 1870 Place: London

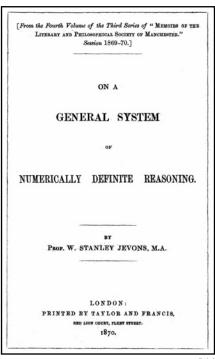
Publisher: Taylor and Francis

Edition: Offprint Language: English

Binding: original paper wrappers Pagination: pp. 329–352 Size: 218x140 mm

In this paper, Jevons proposes a modification of the systems to permit numerical quantities in the logical reasoning developed by **George Boole** and **Augustus DeMorgan**. In standard logical forms, the only quantitative elements usually allowed are *all*, *some*, or *none*.

Illustrations available: Title page



J 14

J 15 **Jevons, William Stanley** (1835–1882)

On the mechanical performance of logical inference. In Philosophical Transactions of the Royal Society for the year MDCCCLXX Vol. 160 - Part II.

Year: 1870 Place: London

Publisher: Royal Society of London

Edition: 1st Language: English

Binding: original paper wrappers Pagination: pp. 497–518 Collation: 3Y–3Z⁴4A³

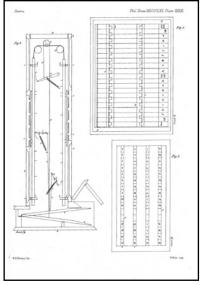
Size: 302x233 mm

Reference: Cou AoL, p. xiii; Ran ODC, p. 423

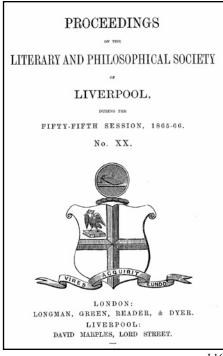
It was in this paper presented to the Royal Society that Jevons described his machine for logical inference popularly known as Jevons' logical piano because of the fact that it had piano-like keys for entering the terms of the logical elements. Jevons, while possessing mechanical abilities himself, had the machine constructed by a Salford clock maker. A description of the mechanism can be found in a paper by George Buck and Stephen Hunka, "W. Stanley Jevons, Allan Marquand, and the Origins of Digital Computing," Annals of the History of Computing, Vol. 21, No. 4, 1999, pp. 21–27. It was evidently much admired when it was exhibited to the Royal Society in 1870 as it could solve logical problems with 2¹⁶ (65,256) possible states—something that a human would find difficult. While it was capable of solving complex logical problems, its main use was as a classroom demonstration device. At the end of this paper, Jevons states: ...it will be evident that mechanism is capable of replacing for the most part the action of thought required in the performance of logical deduction. At the time, this was a bold statement. In a postscript, Jevons notes that Alfred Smee (The process of thought adapted to words and language together with a description of the relational and differential machines, 1851) had earlier proposed this same idea, but that it was little known and that Jevons himself had not been aware of this work before presenting the paper.

The logical piano is currently owned by and usually on display at the Oxford Museum of the History of Science. An illustration can be found in the entry for **Jevons**, **William Stanley**; *The principles of science*, 1874.

Illustrations available:
Plates of the mechanism (3)



Jevon's mechanism, J 15



J 16 **Jevons, William Stanley** (1835–1882)

Preliminary account of certain logical inventions. The logical abacus and logical machine. In Proceedings of the literary and philosophical society of Liverpool, during the fifty-fifth session, 1865–66. No. XX, Eleventh ordinary meeting.

Year: 1867 Place: London

Publisher: Longman, Green, Reader & Dyer

Edition: 1st Language: English

Binding: contemporary embossed boards; gilt spine

Pagination: pp. 177–179 Size: 220x142 mm

Jevons had experimented with different forms of teaching aids before creating his logical piano (see **Jevons**, *On the mechanical performance of logical inference*, 1870). He presented this lecture describing a *logical abacus*—a comparatively simple device consisting of a number of marked blocks of wood that could be manipulated on a series of shelves to produce the solution to a logical problem. Unfortunately, this is only a notice of the lecture and not a transcript. It contains no illustrations or detail. A complete description of the abacus can be found in **Jevons, William Stanley**; *The substitution of similars*, 1869.

Illustrations available: Title page J 17

Jevons, William Stanley (1835–1882)

The principles of science: a treatise on logic and scientific method. [two volumes]

Year: 1874 Place: London Publisher: Macmillan Edition: 1st Language: English

Figures: engraved frontispiece of logical machine

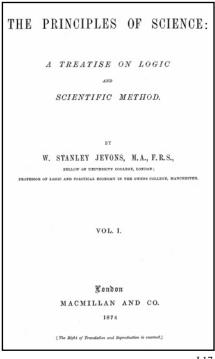
Binding: original cloth boards, worn

Pagination: v.1: pp. xvi, 464; v.2: pp. viii, 480 Collation: v.1: A–2G⁸; v.2: [A]⁴B–2H⁸

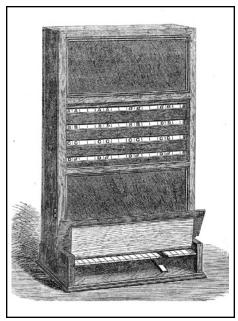
Size: 223x137 mm

This is Jevons' major work. It contains all his advances to the development of logic set in the framework of the philosophy of science. He insisted that absolute certainty of observation is impossible for a human, and thus all logical deductions from laboratory experiments must be considered true only within a certain probability. He was an early explorer of the methodology of measurement and associated errors. He takes his illustrations from the physical sciences and, occasionally, from mathematics. At the time, he was criticized for not including any mention of the biological sciences. The frontispiece is an illustration of his logical piano.

Illustrations available:
Title page, Volume 1
Title page, Volume 2
Logical piano frontispiece



J 17



Jevon's logical piano, J 17

Jevons, William Stanley (1835–1882)

The principles of science: a treatise on logic and scientific method.

> Year: 1887 Place: London Publisher: Macmillan Edition: reprint Language: English

Binding: original panelled buckram; spine gilt

Pagination: pp. xliv, 786, [2] Collation: a-b8c6B-3D83D2 Size: 190X125 mm

This is a reprint of the second edition.

Illustrations available: Title page

> THE PRINCIPLES OF SCIENCE A TREATISE ON LOGIC SCIENTIFIC METHOD. W. STANLEY JEVONS, AND NEW YORK. 1887.

J 18

J 19

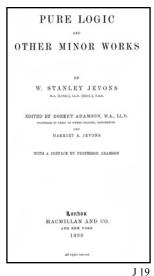
Jevons, William Stanley (1835–1882)

Pure logic and other minor works

Year: 1890 Place: London Publisher: Macmillan Edition: 1st Language: English Binding: original leather Pagination: pp. xxvi, 300 Collation: π13B-T8U6 Size: 225x145 mm

This is a collection of Jevons' papers assembled after his death by his wife (Harriet Jevons) and Robert Adamson, a professor of logic at Manchester. It consists of two distinct sections, papers Jevons wrote early in his career and those written shortly before his death. The early material contains his paper Substitution of Similars (see separate entry), in which he describes his logical abacus, and On the mechanical performance of logical inference (see separate entry), in which he describes his logical piano. These two sections use the same illustrations as those used in the original publication.

Illustrations available: Title page



J 20 Jevons, William Stanley (1835–1882)

Pure logic or the logic of quality apart from quantity: with remarks on Boole's system and on the relation of logic and mathematics.

> Year: 1864 Place: London Publisher: Edward Stanford Edition: 1st Language: English

Binding: original deep-blue cloth boards; panelled; white paper label on front cover and spine; gilt embossed title

Pagination: pp. [vi], 88 Collation: A³B–F⁸G⁴ Size: 180x126 mm

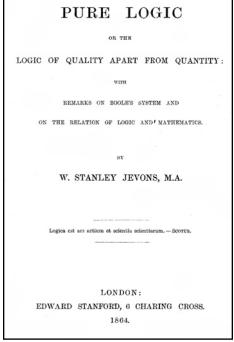
This is Jevons' first publication on logic and one of the two small works (the other being *Substitution of similars*) in which he attempted to provide an alternative approach to **Boole**'s system. Jevons disliked **Boole**'s emphasis on mathematical notation, although he apparently respected **George Boole** himself. The last chapter is devoted to critical remarks on **Boole**'s system and the relation between logic and mathematics. Comparing the two systems, he remarks:

There are now two systems of notation giving the same formal results, one of which gives them with self-evident force and meaning, the other by dark and symbolic processes ... it must be for the author or supporters of the dark system to show that it is in some way superior to the evident system.

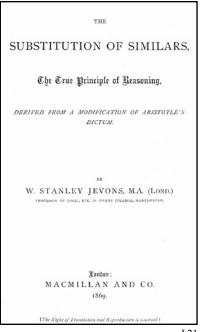
This copy has the bookplate of a Charles J. Poynting, perhaps the son of the famous physicist John Henry Poynting. Both had a close association with Owens College, Manchester, where Jevons was at the time of this publication.

Illustrations available:

Title page



I 20



J 21

J 21

Jevons, William Stanley (1835–1882)

The substitution of similars, the true principle of reasoning, derived from a modification of Aristotle's dictum.

Year: 1869 Place: London Publisher: Macmillan Edition: 1st Language: English

Binding: original deep-blue cloth boards; spine gilt-embossed

title

Pagination: pp. viii, 86, [2], 24 Collation: A^4B – $F^8G^4\chi^{12}$ Size: 165x113 mm

This is the work in which Jevons first described his logical abacus, a representation of which appears in the frontispiece. Jevons explains the title by saying that we

... argue by analogy *from like to like* and take one thing as representative of another...which may perhaps be best described as the *substitution of similars*.

By the time of this publication, **George Boole** had died, but Jevons pays tribute to the man, and damns his system, by writing

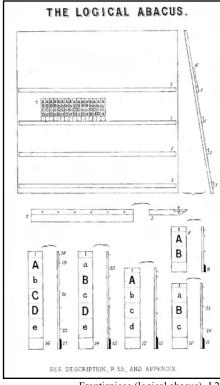
The new and wonderful results of the late Dr. Boole's mathematical system of Logic appear to develop themselves as most plain and evident consequences of the self-same process of substitution ... Should my notion be true, a vast mass of technicalities may be swept from our

logical text-books, and yet the small remaining part of logical doctrine will prove far more useful than all the learning of the Schoolmen.

This is a presentation copy from the author, but there is unfortunately no indication of who it was for.

Illustrations available:

Title page and frontispiece of logical abacus



Frontispiece (logical abacus), J 21

J 22 **Jillson, Arnold**

A treatise on instrumental arithmetic: or, utility of the slide rule. Designed as a pocket companion for the mechanic, manager and operative. With full and complete instructions for every mechanic and operative to make their own calculations.

> Year: 1866 Place: Hartford

Publisher: Case, Lockwood and Co.

Edition: 2nd? Language: English

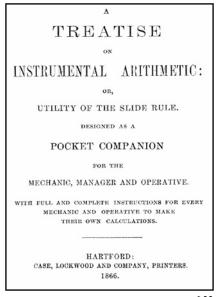
Binding: original cloth boards Pagination: pp. viii, 9–194

Collation: 1–8¹²9¹ Size: 112x84 mm

This work describes two different instruments, neither of which is illustrated. The first is a standard slide rule. The second, which the author calls *an engineer's*

rule, is obviously a slide rule but is described thus: it has a joint in the middle, and is 24 inches long when opened out. This would imply some form of Coggeshall rule (see entry for Coggeshall, Henry; The art of practical measuring, 1745). The examples are derived from practical manufacturing, gauging and machining situations.

Illustrations available: Title page



J 22

J 23 Johns, Victor

On the mechanical handling of statistics. In The American Mathematical Monthly, Vol. XXXIII, 1926.

Year: 1926

Place: Menasha, WI

Publisher: Mathematical Association of America

Edition: 1st Language: English

Figures: 10 photos of electric tabulating equipment (punched

card)

Binding: library buckram; marbled endpapers

Pagination: pp. 494–502 Size: 248x173 mm Reference: Ran *ODC*, p. 424

Johns was an official of the International Business Machines of New York—as noted by the editor in a footnote.

This article is a brief history of the original electromechanical Hollerith punched card equipment as used in the original 1890 U.S. census. It also illustrates the different forms of IBM equipment (punches, sorters, tabulating machines, etc.) that were available in 1926. It is notable in that it contains a rare tiny photograph of

the original Hollerith horizontal sorter (before it was redesigned into the vertical back breaker model) as well as the subsequent vertical and horizontal redesigns. This paper was invited by the editors because at the time a number of universities and colleges were developing courses in the use of this equipment.

Illustrations available: Sorters

I 24

Johnson, John (fl.1602–1657)

Johnson's arithmetick in two bookes: The first vulgar arithmetick with easie rules to worke all the first four parts of arithmetick, in whole numbers and fractions. The second of decimall arithmetick, whereby all fractionall operations are wrought in whole number in merchants accompts, without reduction; with the perfect working of interests and annuities.

Year: 1649 Place: London

Publisher: R. C. for John Sweeting

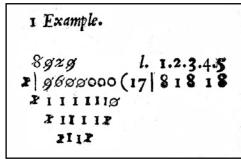
Edition: 5th Language: English

Binding: contemporary leather Pagination: pp. [12], 168, 159-421, [1]

Collation: A6B-T12 Size: 140x80 mm

Johnson describes himself as a surveyor and practitioner in the mathematics. He was also a physician. He came from Thorpe le Soken in Essex, where he published almanacs, but he later moved to London to become a teacher of arithmetic and geometry.

The first of these books deals with arithmetic using fractions, and the second deals with decimal numbers. His decimal notation is particularly crude, using a vertical bar (|) for the decimal separator, and also using 1, 2, 3, 4, etc. above each of the decimal digits to designate its position. The second book on decimals has a separate title page. Johnson uses the galley method of division throughout.



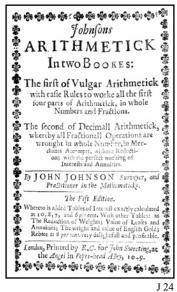
Decimal notation, J 24

The first edition was in 1622, second in 1633, and fourth in 1646; a ninth edition is known from 1677.

Illustrations available:

Title page

Divisional title page for second book Example of decimal notation.



J 25

Johnson, William Walter (1879–); and [Theodor Wittstein (1816–1894)]

Addition and subtraction logarithms to seven decimal places

> Year: 1943 Place: Chicago

Publisher: Charles T. Powner

Edition: 1st Language: English

Binding: original cloth boards; with dust jacket

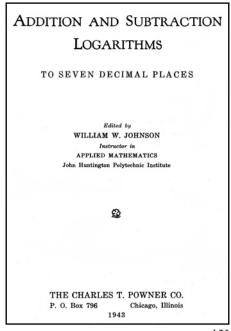
Pagination: pp. viii, 126 Collation: $\pi^41-15^416^3$ Size: 228x165 mm

Johnson was an instructor in applied mathematics at John Huntington Polytechnic Institute.

Addition and subtraction present difficulties when a person is dealing with computations that would normally be done with logarithms. The calculator must convert logarithmic values back into regular numbers, do the operation and then reconvert the result back into logarithmic notation to continue with multiplicative operations. This table allows one to perform additive operations directly on logarithmic quantities and thus avoid several steps.

According to Alan Fletcher (An Index to mathematical tables), Johnson's main table is photographically reproduced, without acknowledgement of the source, from T. Wittstein, *Siebenstellige Gaussische Logarithmen* ... 1866.

Illustrations available: Title page Sample table page



J 25

J 26 **Jordaine, Joshua**

Mr. Jordaine's duodecimal arithmetick: Being the most concise and exact method extant. In three books. Containing notation, addition, subtraction, multiplication, division, reduction, extraction of the square and cube roots, rule of proportion, direct and reverse. Duodecimally perform'd, and very practically applied to the measuring of all sorts of superficies and solids, as board, glass, &c. timber, stone, &c. But chiefly to the gauging of all sorts of brewers tuns and casks, to find the whole content, or the vacuity or remaining liquor of either, and that with more ease and expedition, than by vulgar or decimal arithmetick. Very useful for all sorts of men, as well as gentlemen as others, but especially for merchants, writing - masters, and all measuring artificers. And all the rules made plain and easie for the meanest capacity.

Year: 1717 Place: London

Publisher: Edmund Parker

Edition: 2nd Language: English

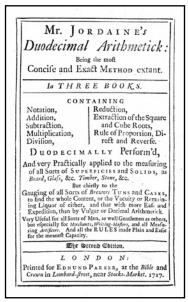
Figures: 1 large folding table (follows p. 268) Binding: contemporary leather; rebacked

Pagination: pp. [18], 303, [1] Collation: $\pi^2 B^7 A - T^8$ Size: 185x115 mm

The fact that the foot is divided into twelve inches led Jordaine to develop this duodecimal arithmetic (base 12 using the digits 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10 and 11). He termed the foot to be a *long inch*, the twelfth part of which was *an inch of the square foot*, and then refers later to the various units as *Integers, primes, seconds, thirds*, etc. He begins with an explanation of simple duodecimal arithmetic up to the calculation of cube roots and then devotes large sections to mensuration and gauging. A final postscript describes how duodecimal arithmetic is useful in the exchange of French and Dutch currency. This volume contains a large folding duodecimal multiplication table.

The work was first published in 1687, with two issues recorded by Wing; and a fourth edition is mentioned in a book dealer's literature (but not its date).

Illustrations available: Title page



J 2

J 27

Jordanus de Nemore (1225–1260) - [Faber Stapulensis (1455–1536), editor]

In hoc opere contenta arithmetica decem libris demonstrata. Musica libris demonstrata quattuor. Epitome in libros arithmeticos divi Severini Boettii. Rithmimachie ludus qui et pugna numeroru appellatur.

> Year: 1514 Place: Paris Publisher: H. Stephens Edition: 2nd

Language: Latin

Binding: later half-bound vellum boards

Pagination: ff. [72] Collation: a–i⁸ Size: 279x198 mm

Reference: Rcdi BMI I, p.142; Smi Rara, p. 589; DeM AB, p.

Jordanus de Nemore (Jordanus Nemorarius or Jordanus Saxonia) was a German mathematician who had studied at Paris. He wrote works on arithmetic, geometry, algebra and astronomy. **Smith** (*History of Mathematics*) considers that this is the same person as Jordanus Teutonicus or Jordanus of Saxony (d. 1236 or 1237), leader of the Dominican Order. However, this assertion has been questioned by other authorities. Jordanus was a contemporary of **Fibonacci** and was the first to correctly formulate the law of the inclined plane. Jordanus is often credited with introducing the use of letters for representing an unknown in algebra, but this practice was not yet systematized, and his letters represented both known and unknown quantities—it had to await the work of Francois Viète (1540–1603) before the difference was made clear between the idea of a parameter and an unknown.

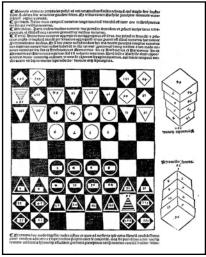
Faber (Jacobus Faber Stapulensis or Jacques le Fevre d'Estaples) was born in Estaples, near Amiens. He was a lecturer in the Collège Lemoine in Paris and wrote on theology, philosophy and mathematics.

Most of this volume (ten books on arithmetic) is by Jordanus, edited and with a commentary by Faber



Stapulensis. The second part is titled *Four Books on Music* but in reality is a tract on fractions by Faber Stapulensis. The third part is the Epitome (abridgement or *Reader's Digest* version) of the arithmetic of **Boethius** by Faber Stapulensis. The fourth part is a brief description in dialogue form of *Rithmomachia* (*battle of numbers*), a medieval mathematical game invented in the eleventh century and popular during the entire period of the Middle Ages. This section is based on a manuscript written by John Shirwood (Bishop of Durham, d. 1494), but it is usually attributed to Faber Stapulensis. The first edition was in 1496, and the text in this edition is practically identical.

Illustrations available: Title page Rithmomachia board



Rithmomachia, J 27

Judex Juris [pseudonym]

See **Babbage**, **Charles**; Works of Charles Babbage, M.A., F.R.S, &c. (A Collection of 17 items by or about Babbage bound in 1 volume) On the calculation and printing of mathematical tables by machinery; the inventor and his treatment.

J 28 **Juley, Joseph**

The Ballistic computer. In Bell Laboratories Record, Vol. XXV, No. 1, January 1947.

Year: 1947 Place: New York

Publisher: Bell Telephone Laboratories

Edition: 1st Language: English

Binding: modern buckram boards

Pagination: pp. 5–9 Size: 247x173 mm See entry for American Telephone & Telegraph Company, Bell Laboratories Record, Vol. XXV, 1947.

Illustrations available:

None

J 29

Julian, Eran

Julian's interest book, an accurate calculation of simple and compound interest at 5, 6, 7, 8, 9 and 10 per cent., also valuable discount and time tables.

Year: 1889 Place: Saint Louis Publisher: Author Edition: 1st Language: English

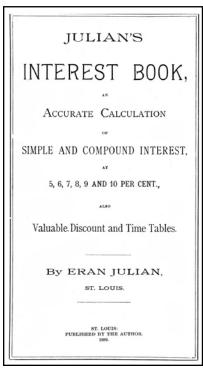
Binding: one-half leather, rubbed; spine retaped

Pagination: pp. 128 Size: 200x118 mm

This is a ready reckoner for interest on sums from \$1 to \$10,000

Illustrations available:

Title page



J 29

J 30

Julian, Eran

Julian's interest book, an accurate calculation of simple and compound interest at 5, 6, 7, 8, 9 and 10 per cent., also valuable discount and time tables.

Year: 1890 Place: Saint Louis Publisher: J. H. Brown Edition: 2nd

Language: English Binding: original maroon buckram; rubbed, gold-stamped,

embossed cover Pagination: pp. 128 Size: 205x118 mm

This second edition appears identical to the first.

Illustrations available: Title page

J 31

Julian, Eran

Julian's interest book, an accurate calculation of simple and compound interest at 5, 6, 7, 8, 9 and 10 per cent., also valuable discount and time tables.

Year: 1894
Place: Saint Louis
Publisher: Author
Edition: 3rd
Language: English
Binding: original yellow buckram; rubbed, gold-stamped,
embossed cover
Pagination: pp. 128
Size: 205x120 mm

The third edition is the same as the previous two.

Illustrations available: Title page

J 32

Juvenalis, Decimus Junius (2nd century) and **Aulus Persius Flaccus**, (34–62) - [**Barten Holyday** (1593–1661), translator]

Decimus Junius Juvenalis and Aulus Persius Flaccus

Year: 1673 Place: Oxford

Publisher: W. Downing for F. Oxlad, Senior; J. Adams, and F.

Oxlad, Junior. Edition: 1st

Language: English

Figures: four engraved plates (2 folding); title in red and black;

tinted portrait

Binding: contemporary leather rebacked

Pagination: pp. [12], 341, [1] Collation: π^2 a-b² B-2V⁴2X³ Size: 291x183 mm

Decimus Junius Juvenalis and Persius Flaccus were Roman satirists.

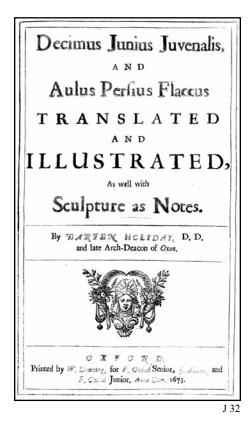
Barten Holyday was an Oxford professor. He produced this translation and commentary on the original Latin works in an attempt to make them more accessible. They were highly thought of in their time, but their turgid style and many digressions make for difficult reading today.

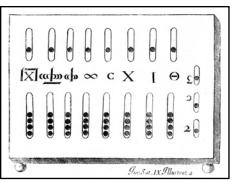
Of interest to this collection is a part of the commentary in which Holyday provides a description (some of it speculative) of the Roman abacus. He freely admits that he does not understand some of the remarks he is interpreting. He indicates that the lower groves, which will hold up to 4 pebbles (*calculi*), represent the values 1–4 while a pebble in the upper grove represents the value 5 (similar to the modern soroban or Japanese abacus). The three short groves, which he admits he does not fully understand, he attributes to halves, quarters and eighths.

Holyday also provides an illustration of finger numerals along with an explanation, which he attributes to **Nicholas of Smyrna**, known also as **Artabasda** (see the entry for **Artabasda** [or Rhabdas]; $Ek\theta\pi\alpha\iota\chi$ *Numerorum Notationis per gestum digitorum*, 1614).

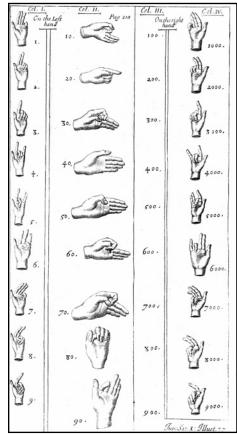
Illustrations available:

Title page Roman abacus Finger numerals

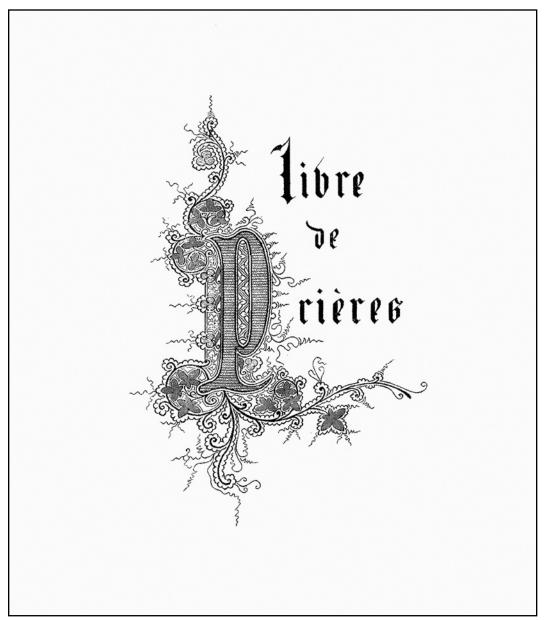




Roman abacus, J 32



Finger numerals, J 32



H 128