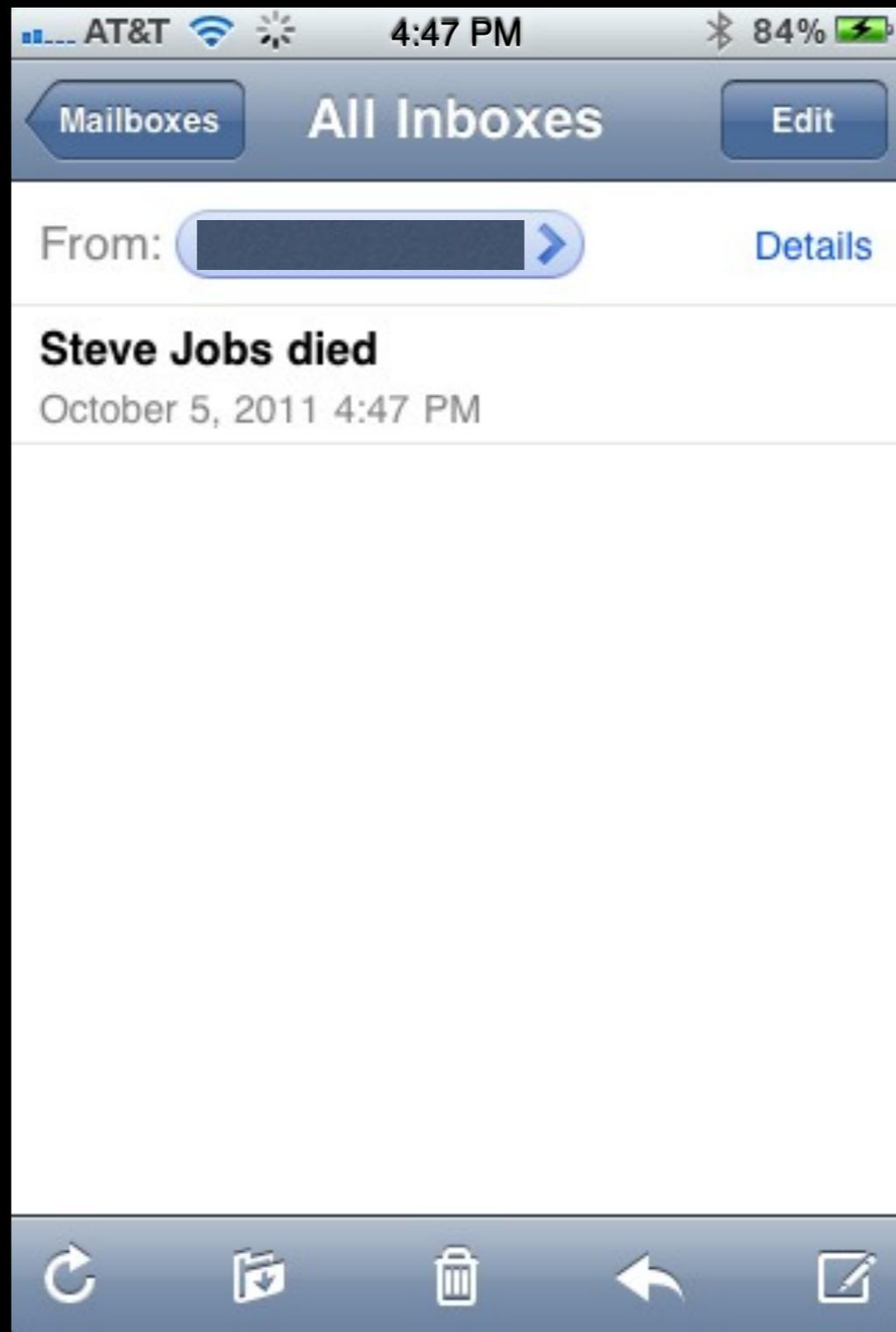


October 5, 2011, 4:47 pm



Email received on my iPhone, Oct 5, 2011, 4:47 pm



Apple Store, Palo Alto, Oct 6, 2011, 7:30 am



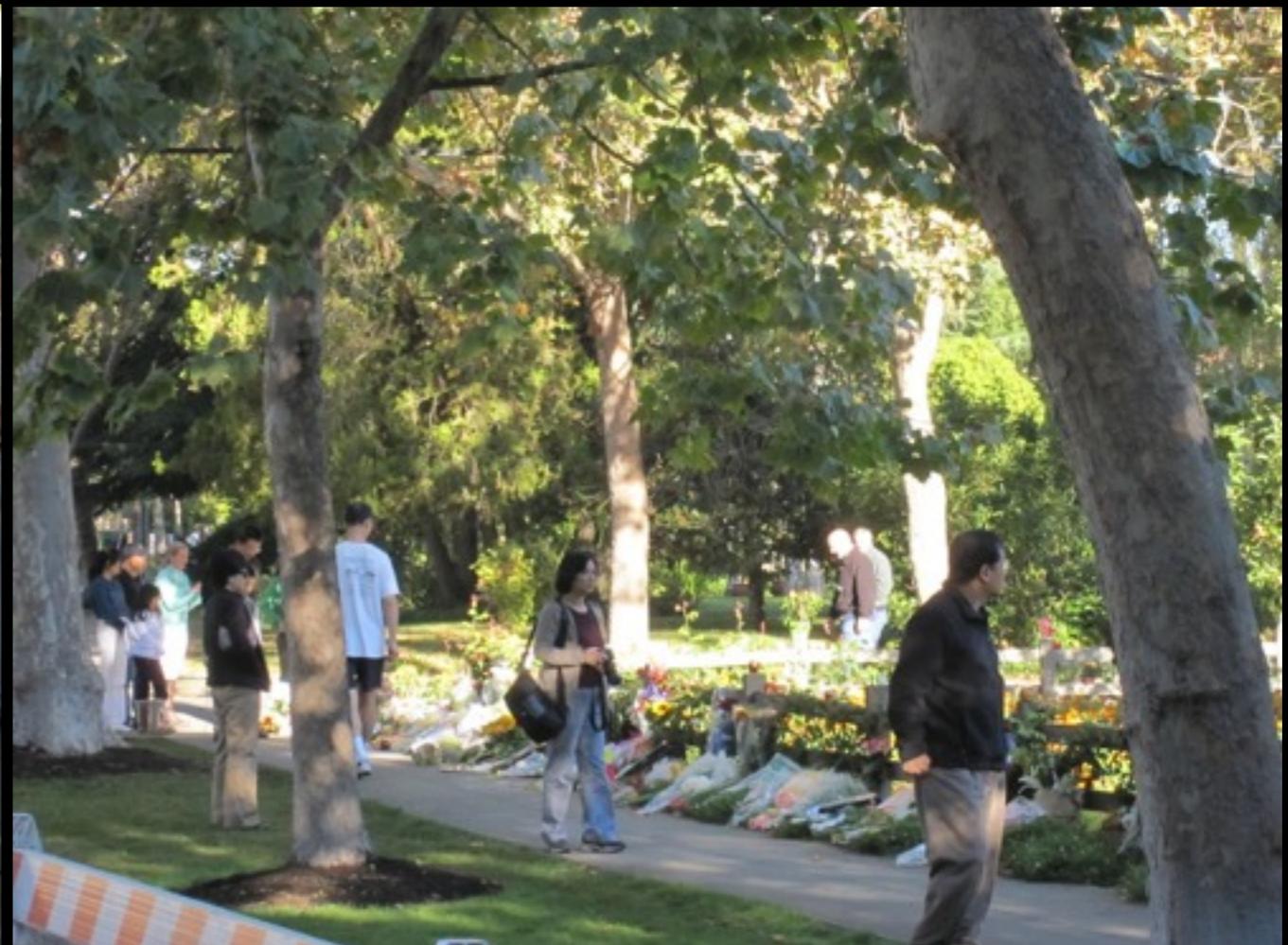
Apple Store, Palo Alto, Oct 6, 2011, 7:30 am

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Apple Store, Palo Alto, Oct 7, 2011



Steve Jobs' house, Waverley Street, Palo Alto, Oct 8, 2011

The First Personal Computing Revolution

Keith Devlin

Who was this? Where? When?

The young man could hardly contain his excitement. He was sure the invention he had just seen could change the world. It would usher in a new era of personal computing. No longer would a businessman or trader have to rely on a member of the select brotherhood of computing professionals to crunch the numbers. He could do it himself.

The people who showed him the invention were fascinated by how it worked, but they clearly did not see what the young man could: its huge commercial potential. As so often happens in history, the right person was in the right place at the right time. Not only had the young man shown mathematical talent at an early age, he had grown up in what was then the acknowledged world capital for innovation, particularly in the business world. He also had the savvy to know how to make the invention available to ordinary citizens. The trick was to package and market it to them directly, in a way that they could at once appreciate and understand.

Within a few years, the young man had succeeded beyond all expectations – save perhaps for his own far-sighted vision. The personal computing revolution was underway, new businesses were being created, new ways of carrying out international trade and commerce were developing, new financial institutions were being established, and new fortunes were being made. The world would never be the same again.

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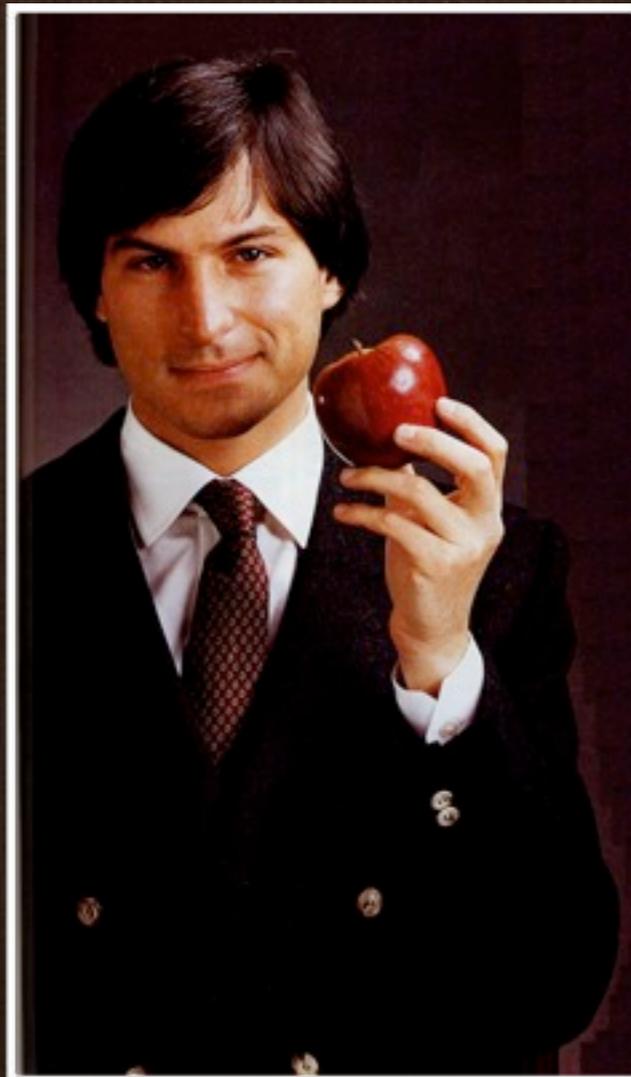
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Silicon Valley, 1979-1984

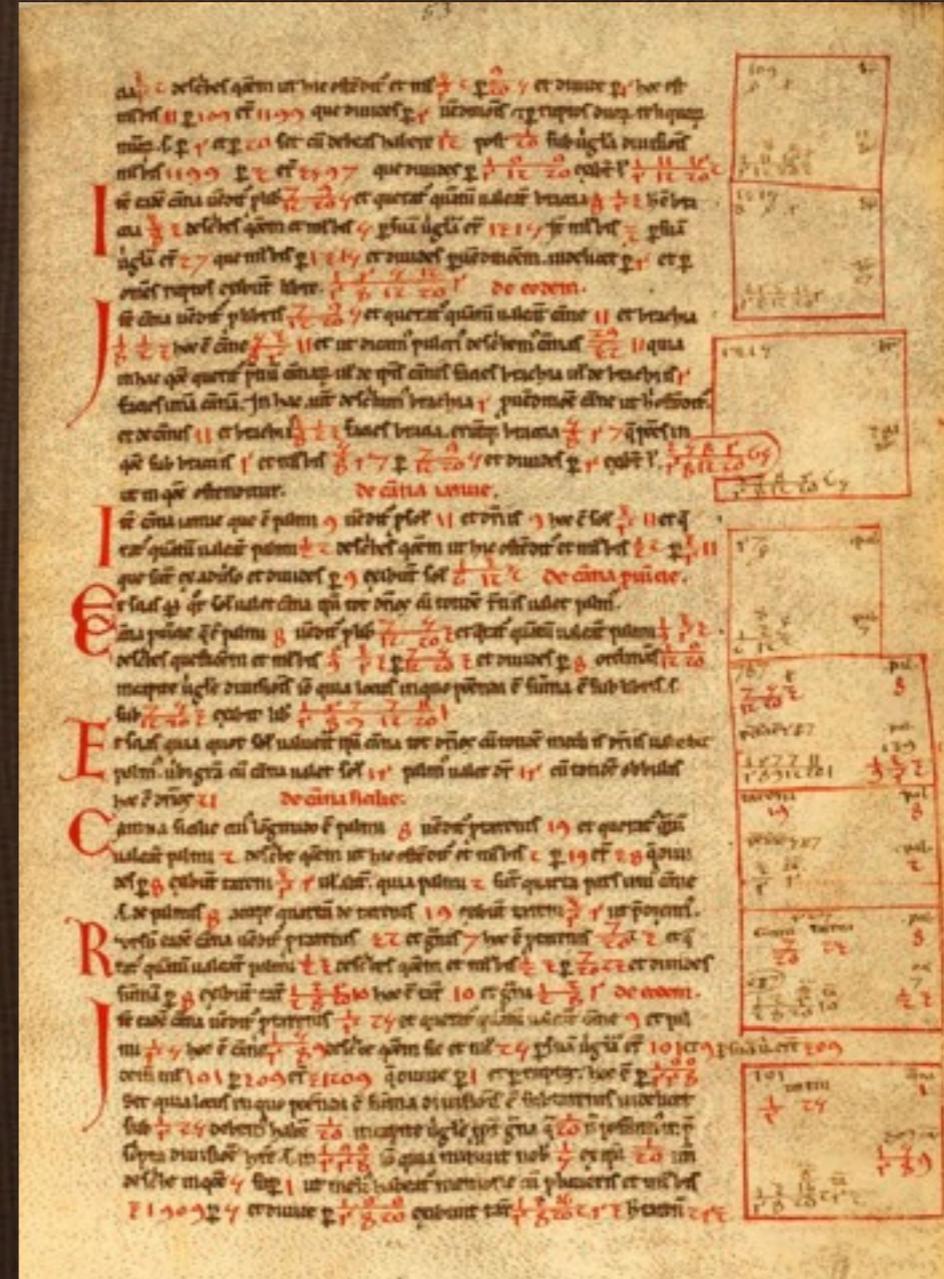
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Pisa, Italy, 1190-1202

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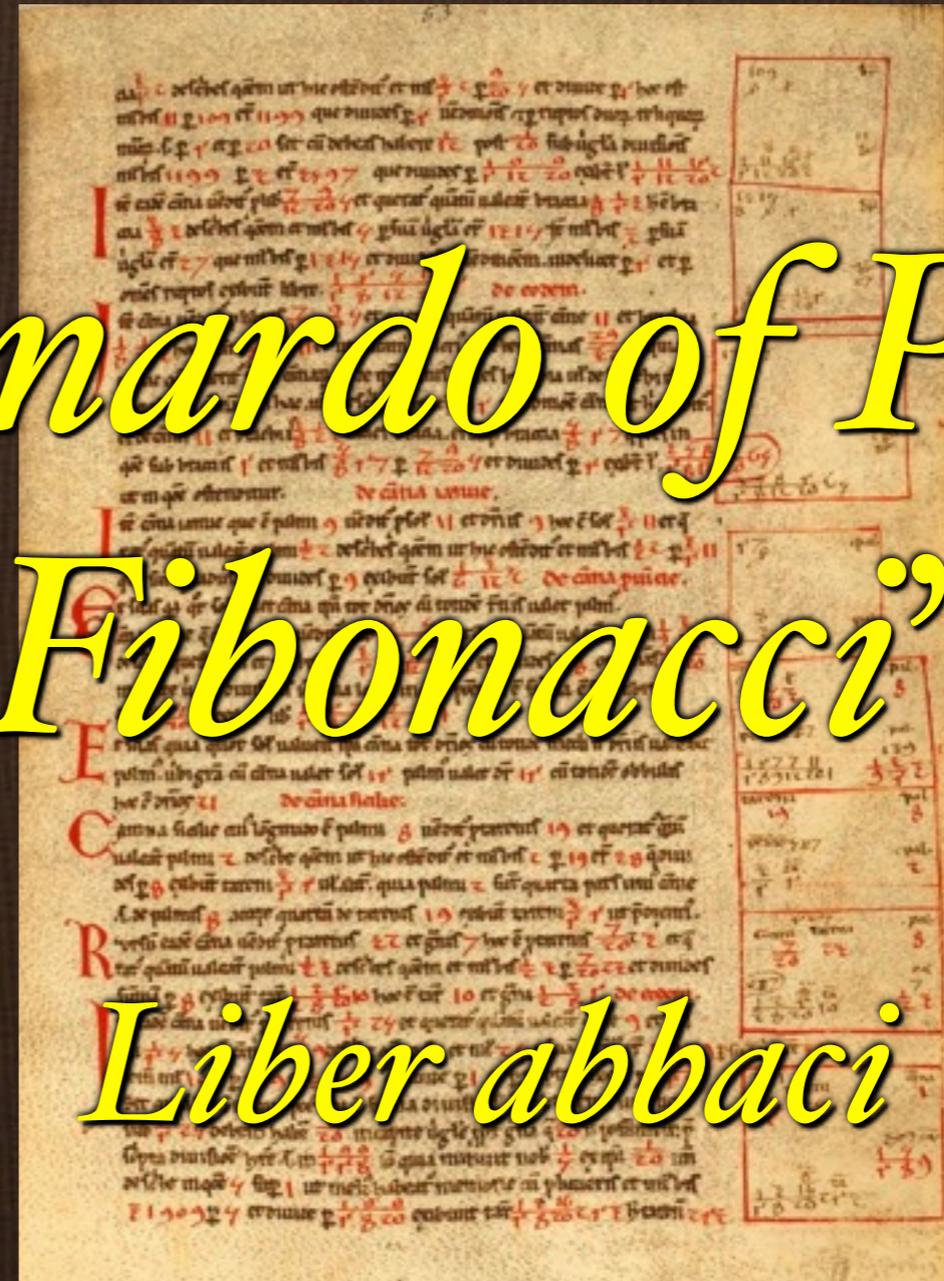
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Another memorial



Piazza XX Settembre across destroyed Central Bridge, September 1944

Another memorial



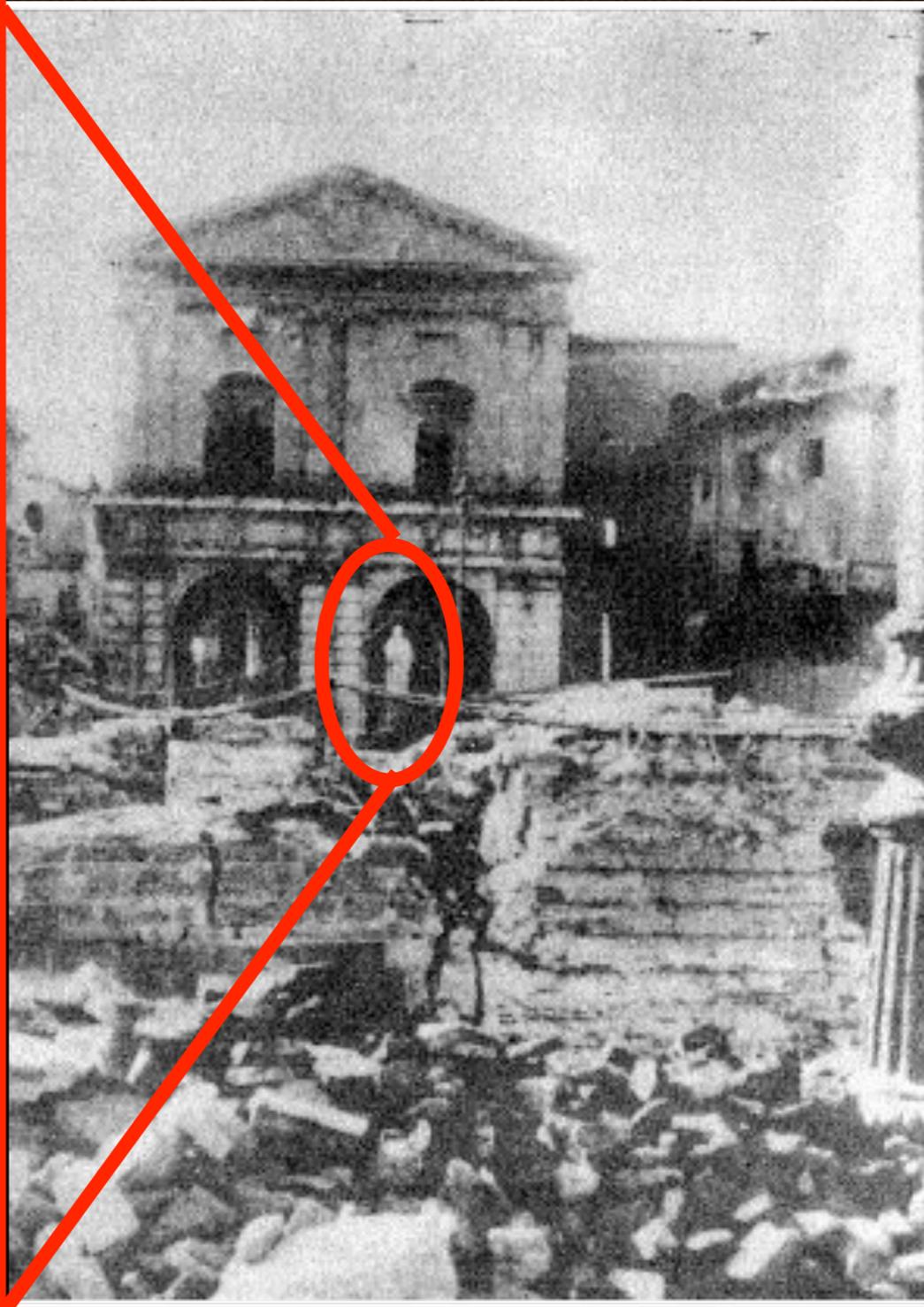
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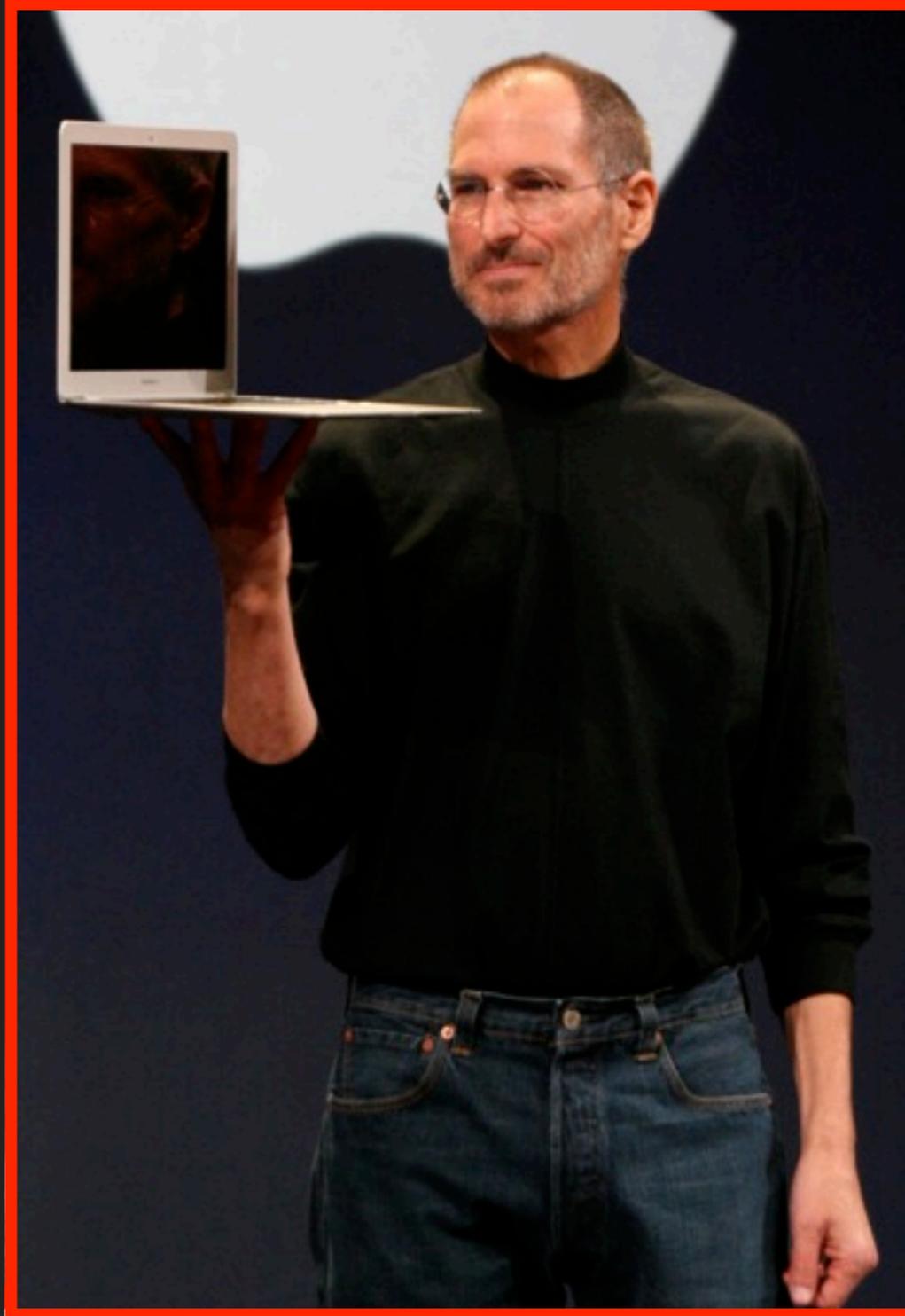
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The comparison



Leonardo Fibonacci



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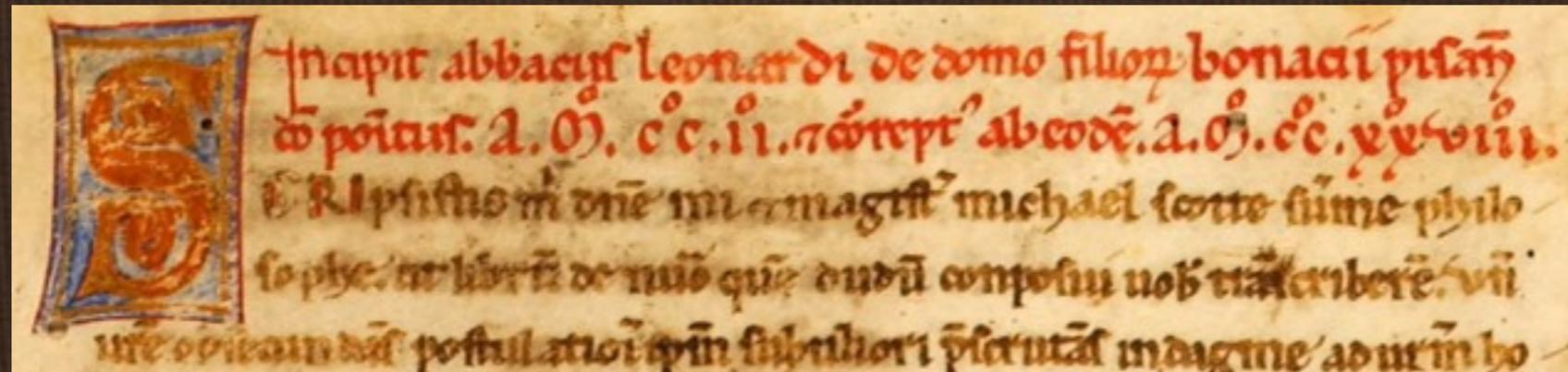
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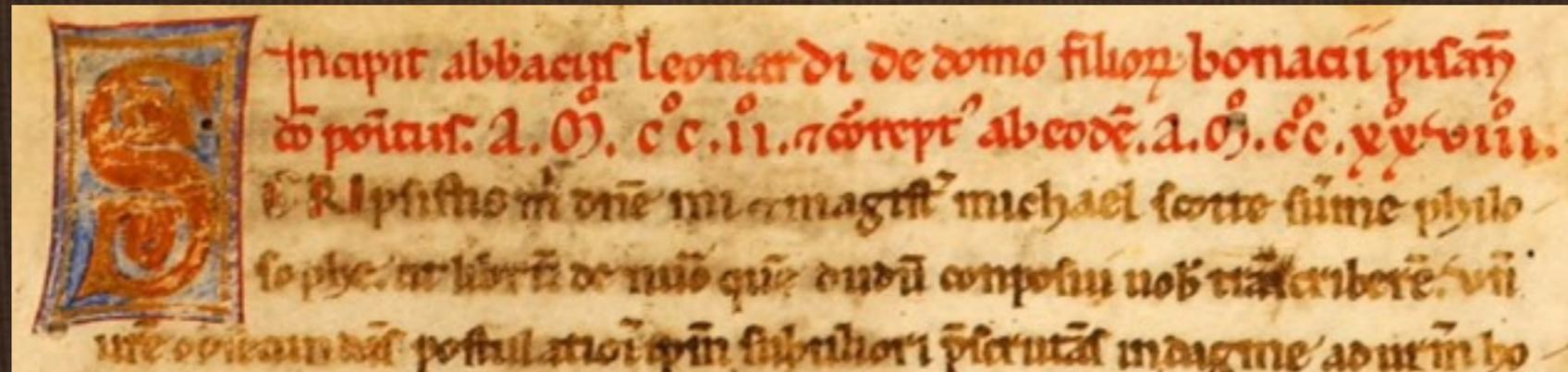
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- ◆ Completed in 1202, this book is generally credited with bringing the Hindu-Arabic number system and its arithmetic to Europe, and launching the modern, Western-led, commercial world.

What was his real name?



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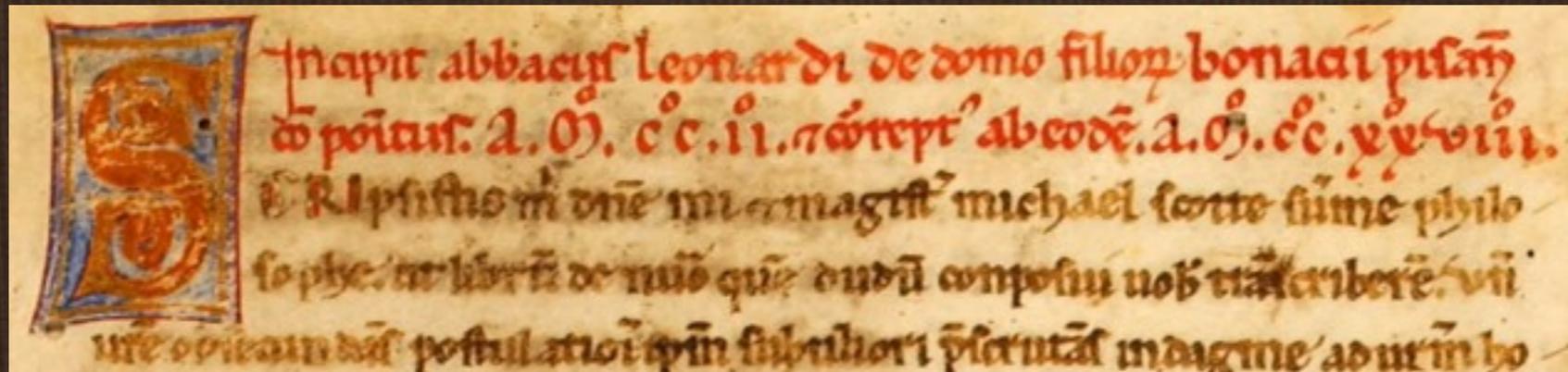
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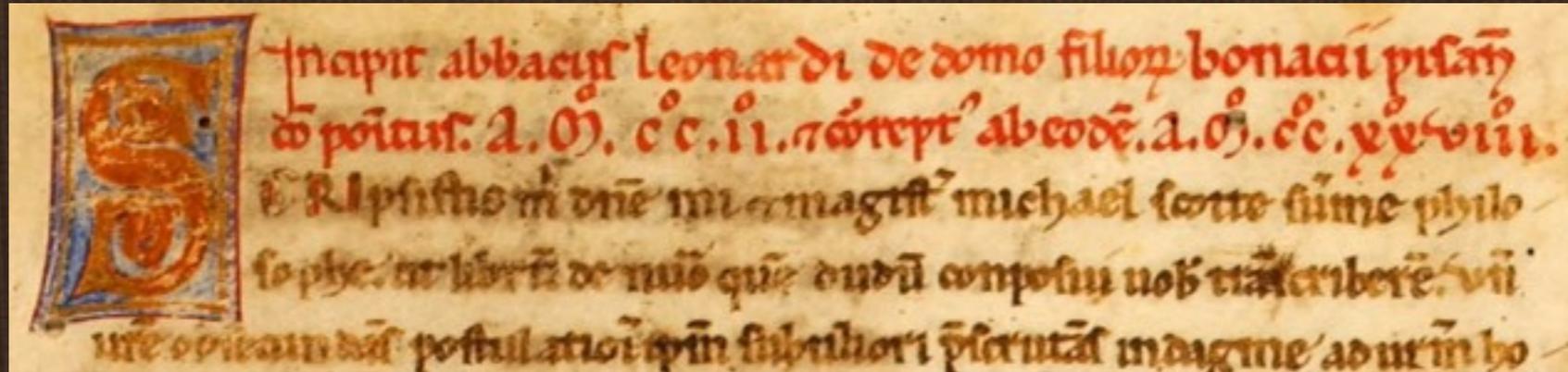
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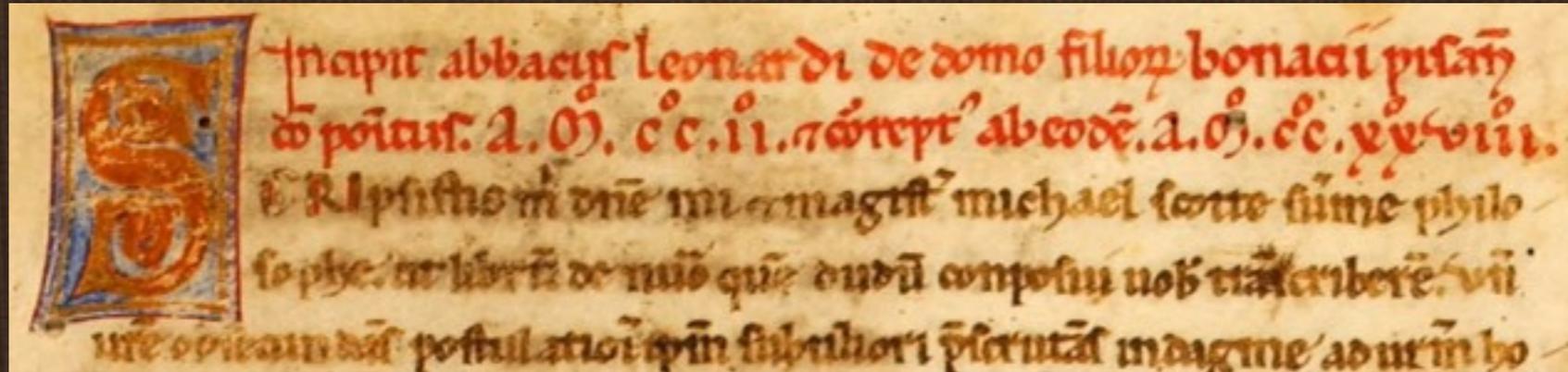
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- ◆ The “Fibonacci sequence” was so named by the French mathematician Edouard Lucas in the 1870s, after Libri coined the nickname Fibonacci.

The Fibonacci sequence

The “Fibonacci sequence”, an unending sequence of whole numbers that begins

1, 1, 2, 3, 5, 8, 13, 21, 34, 55, 89, 144, 233, 377, ...



The rule for generating new numbers in the sequence is that each number is the sum of the two preceding numbers, so $1+1=2$, $1+2=3$, $2+3=5$, etc.

This sequence arises when you solve a particular problem Leonardo gave in *Liber abbaci*:

How Many Pairs of Rabbits Are Created by One Pair in One Year.

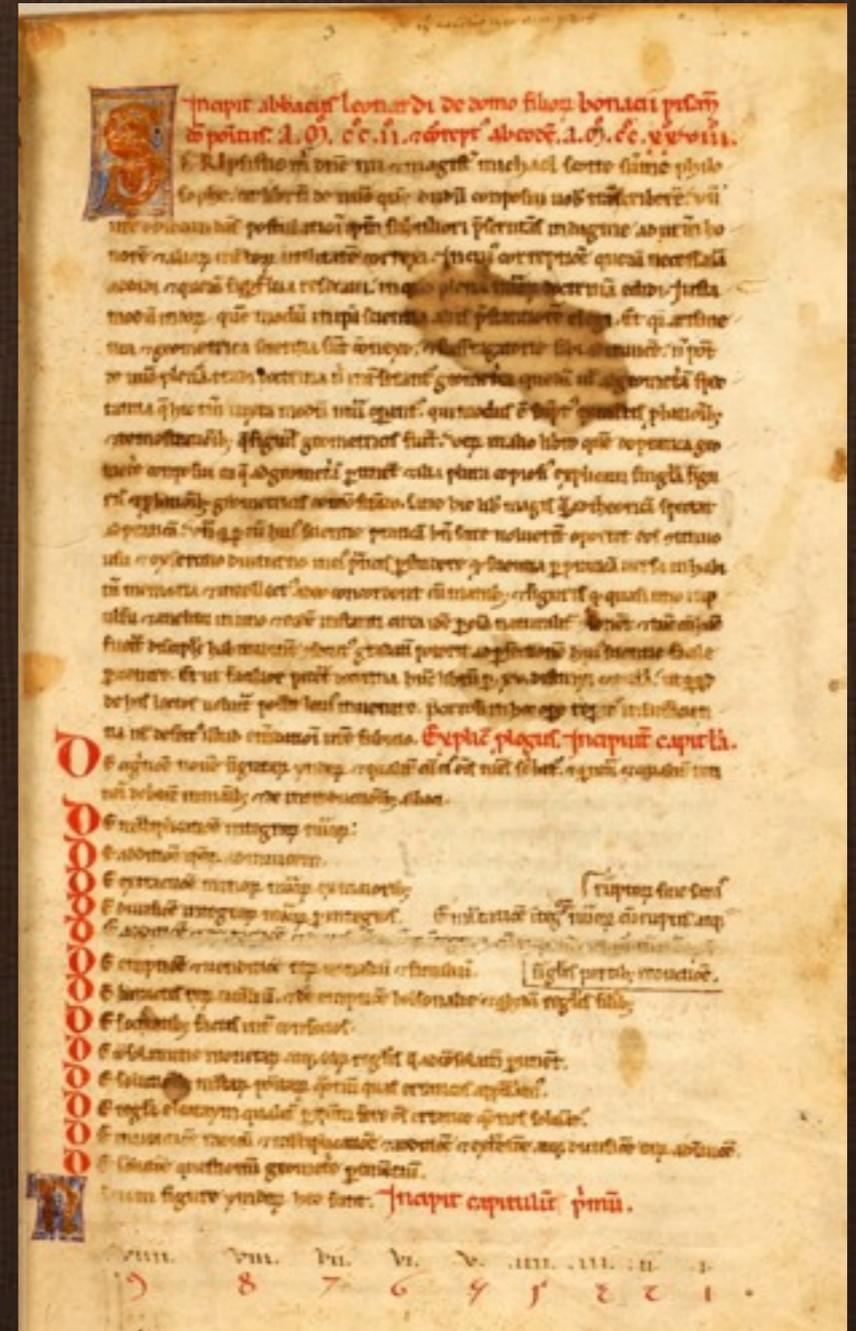
A certain man had one pair of rabbits together in a certain enclosed place, and one wishes to know how many are created from the pair in one year when it is the nature of them in a single month to bear another pair, and in the second month those born to bear also.

The numbers of pairs each month are the Fibonacci numbers. You can read off the answer to Leonardo’s problem: 377 pairs.

The problem and its solution date back well before Leonardo.

Books Leonardo wrote

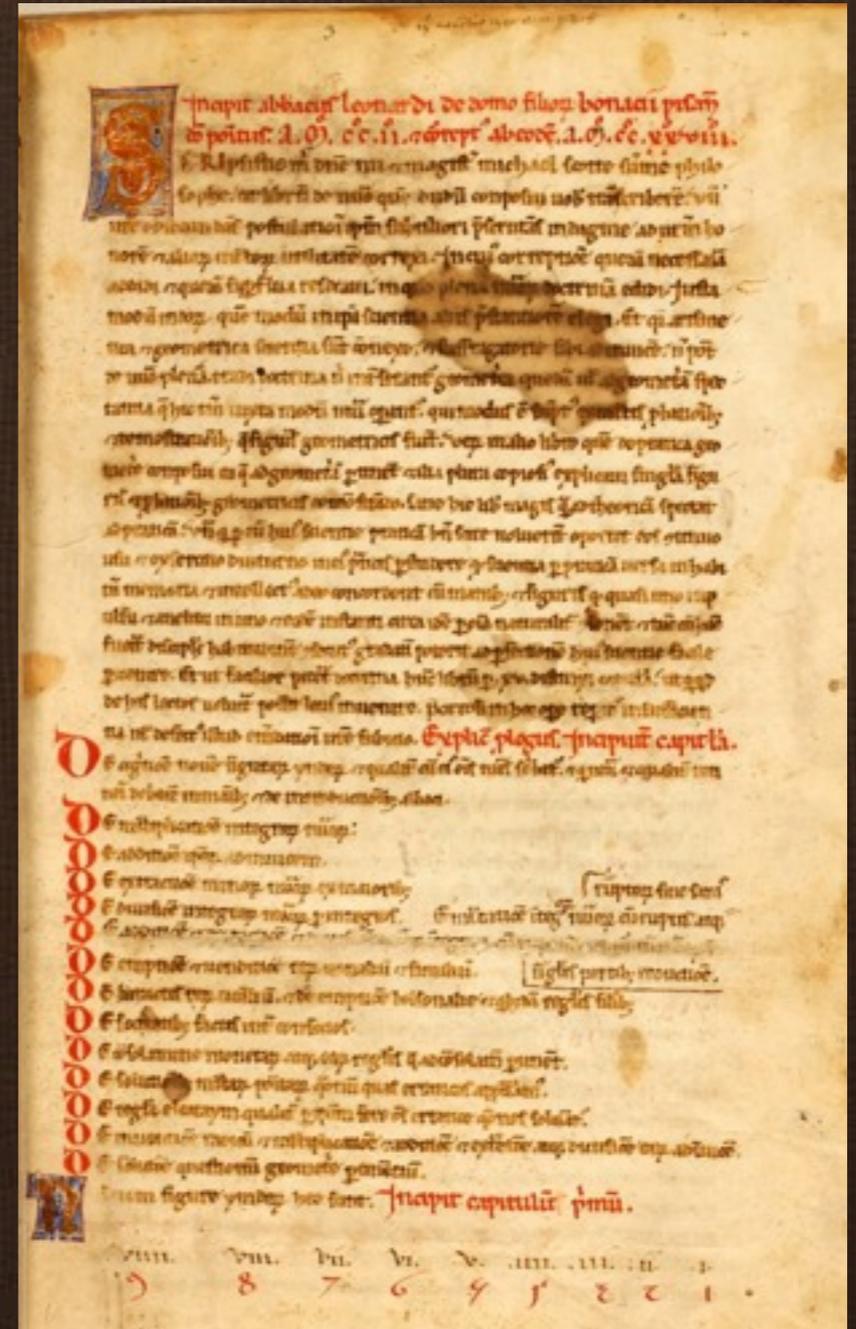
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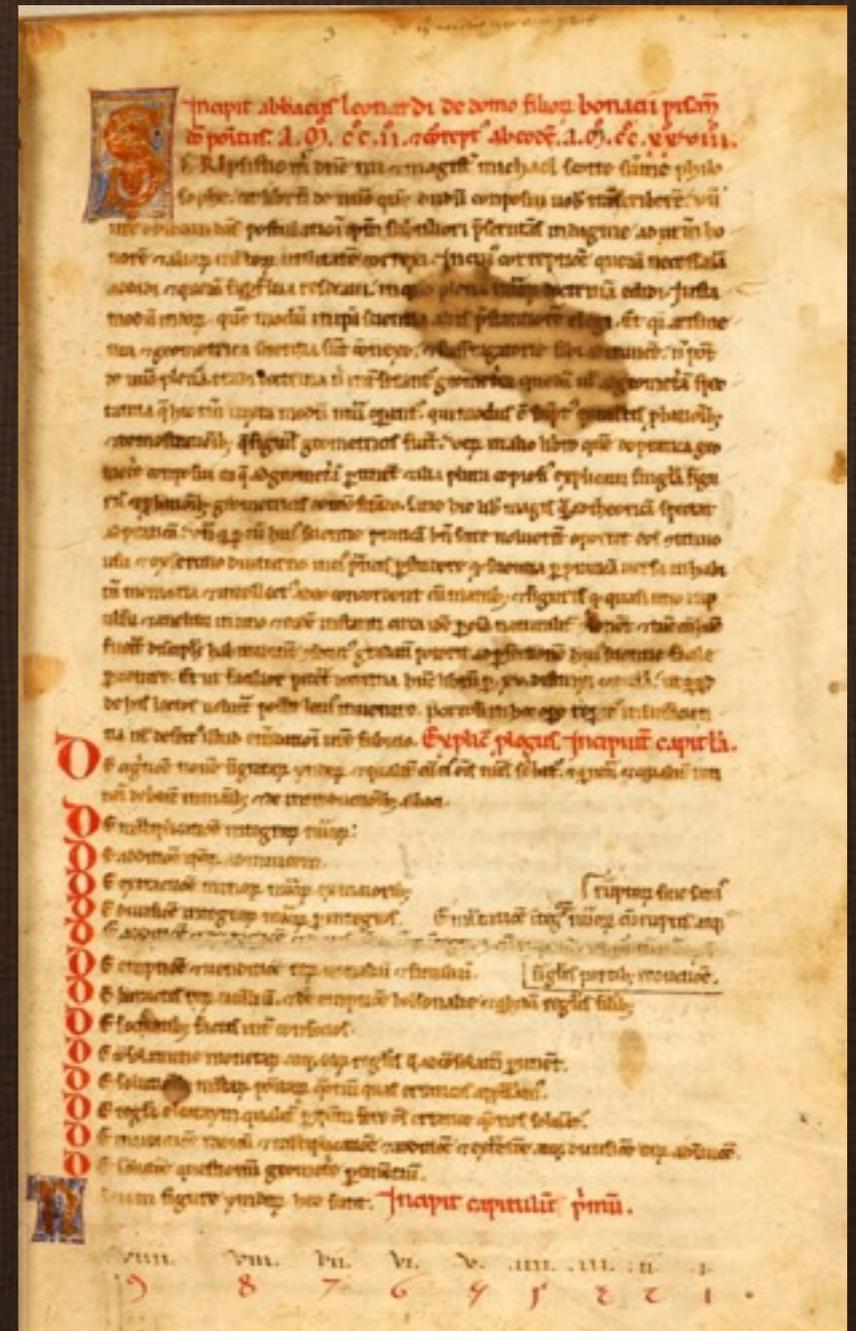
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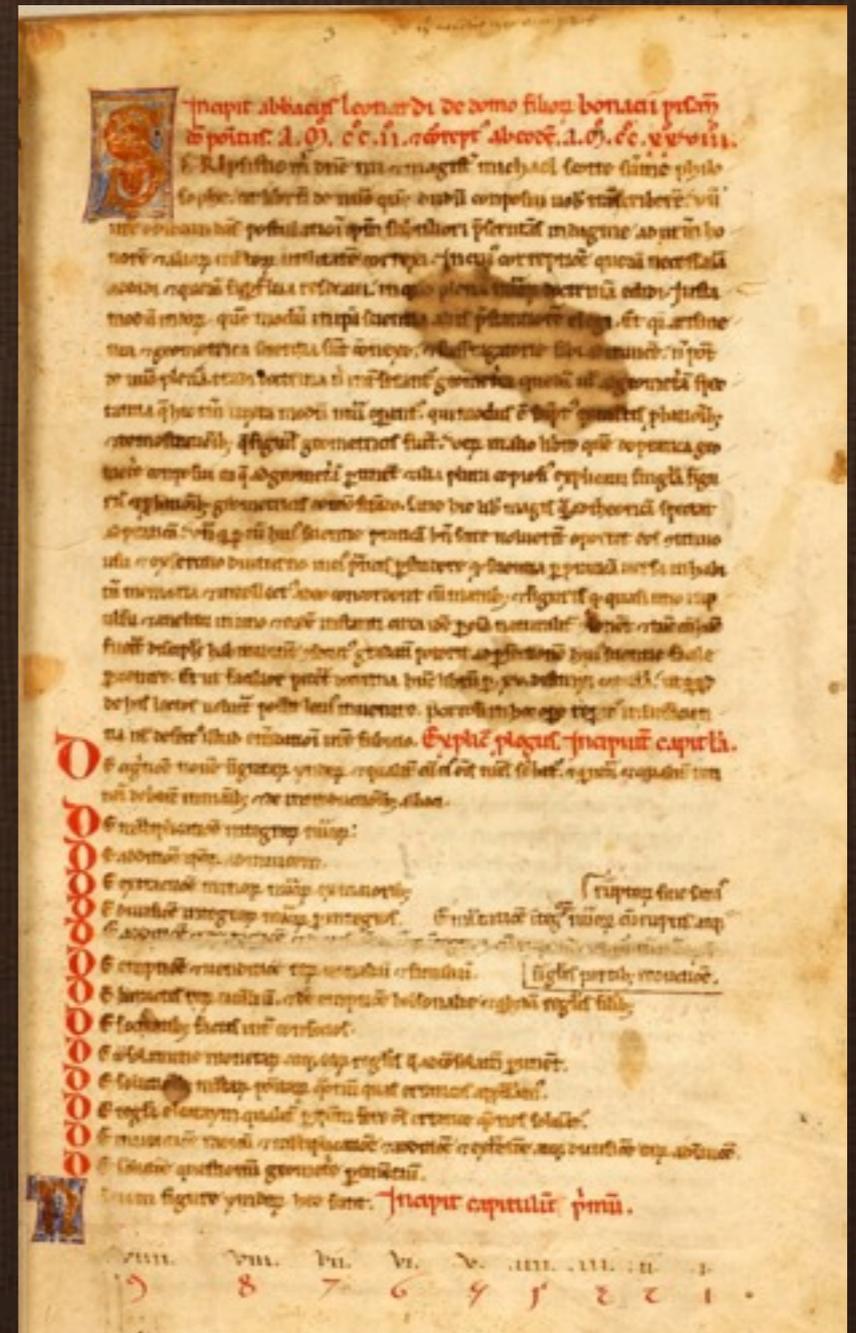
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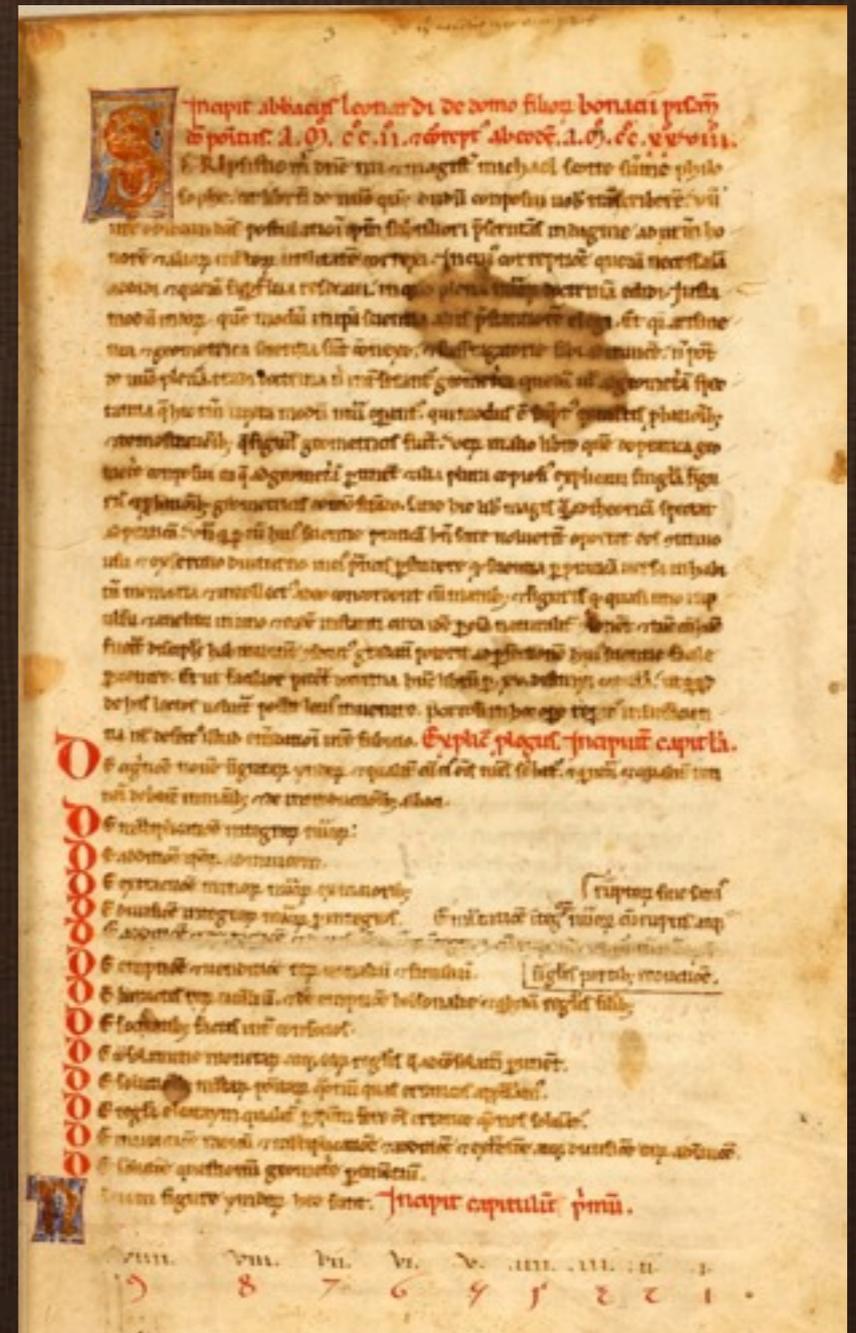
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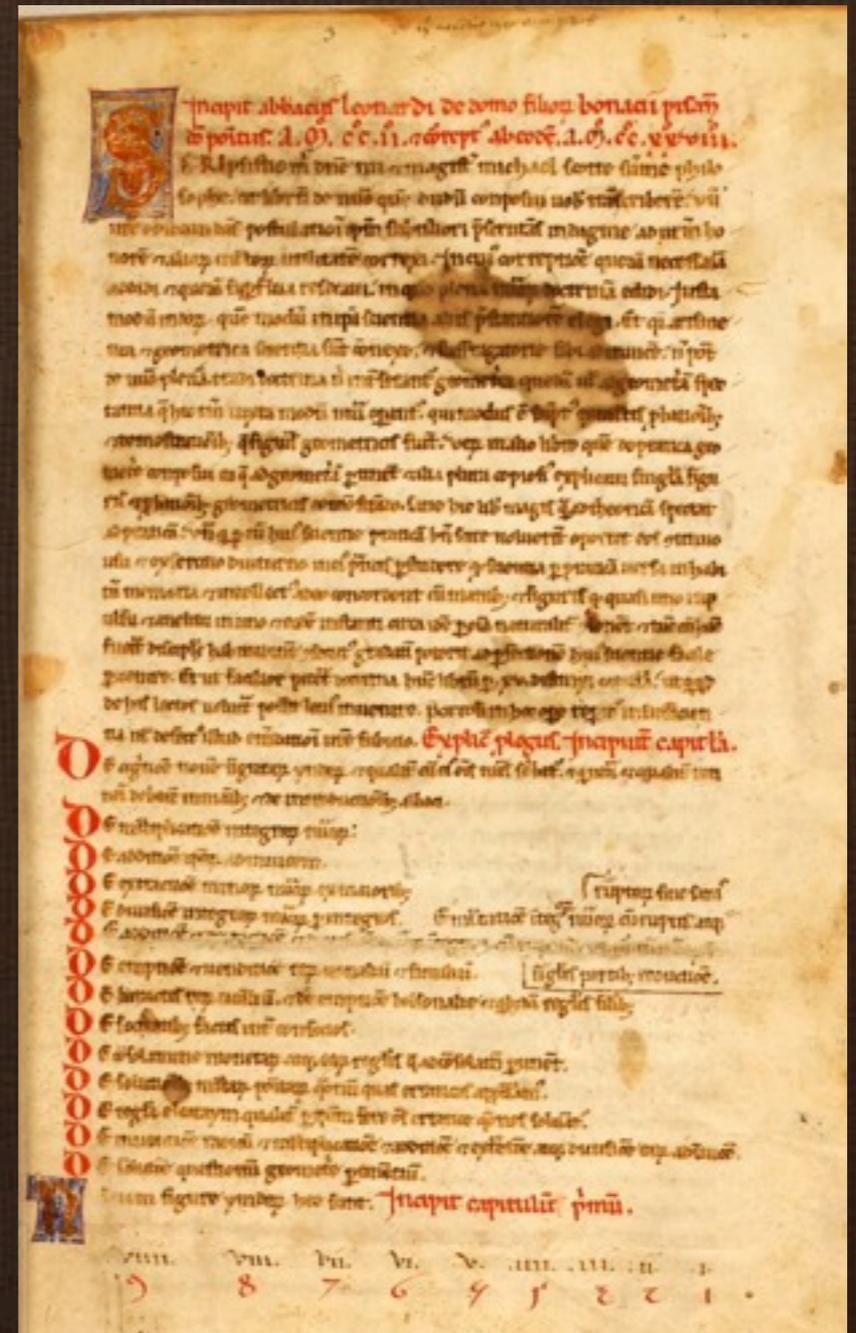
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- ◆ *Liber quadratorum*, (“Book of Squares”, 1225) is an impressive number theory book which, among other things, examines methods to find Pythagorean triples.



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- ◆ Abacus schools (earliest known in Verona in 1294)
- ◆ 1340-1510: records of 20 in Florence alone



Why was Leonardo forgotten?



Printing press, 1436

The Missing Link – 2003

The Missing Link – 2003



Prof Raffaella Franci

The Missing Link – 2003



Via de' Ginari 10, Florence



Prof Raffaella Franci

The Missing Link – 2003



Via de' Ginari 10, Florence



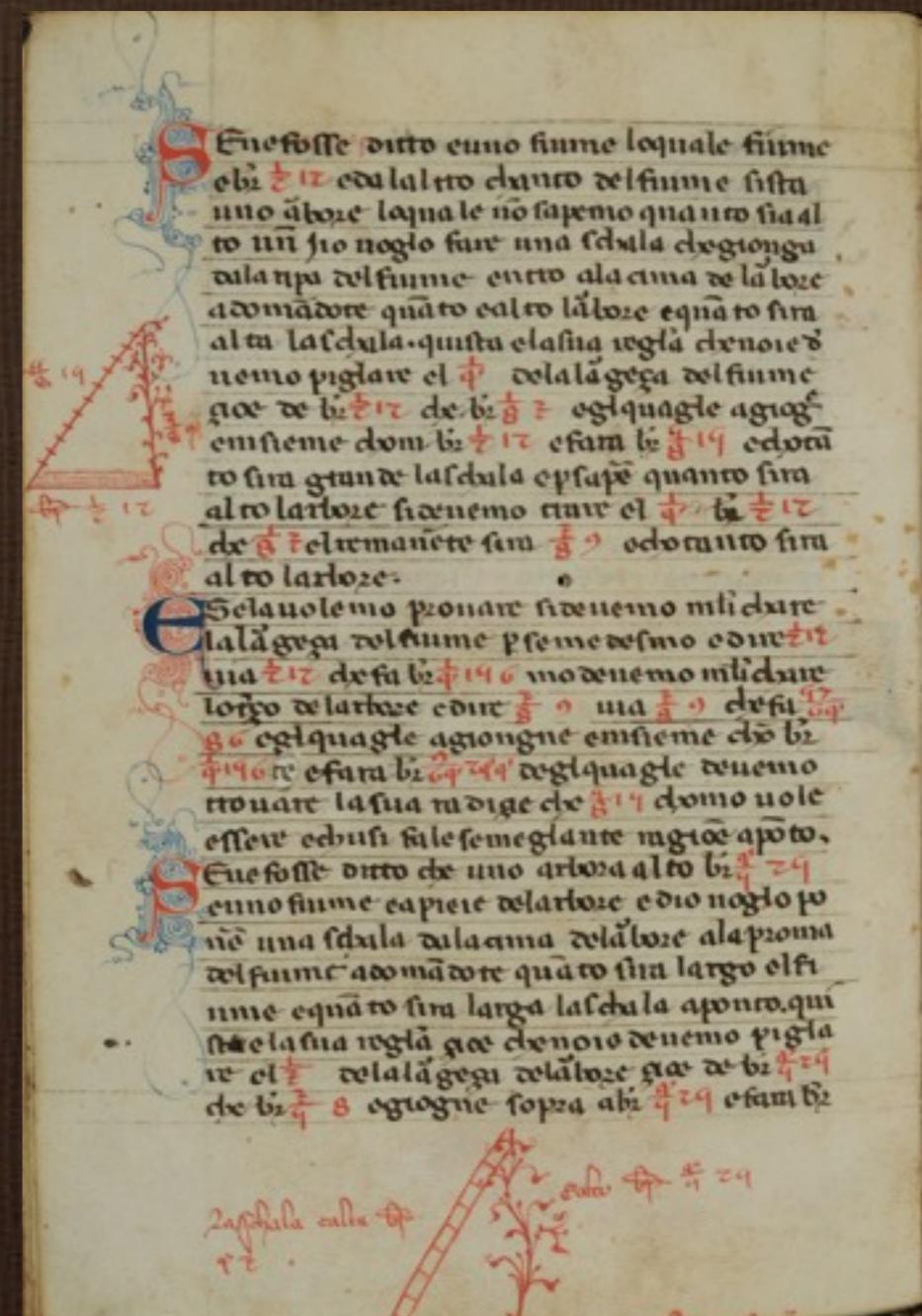
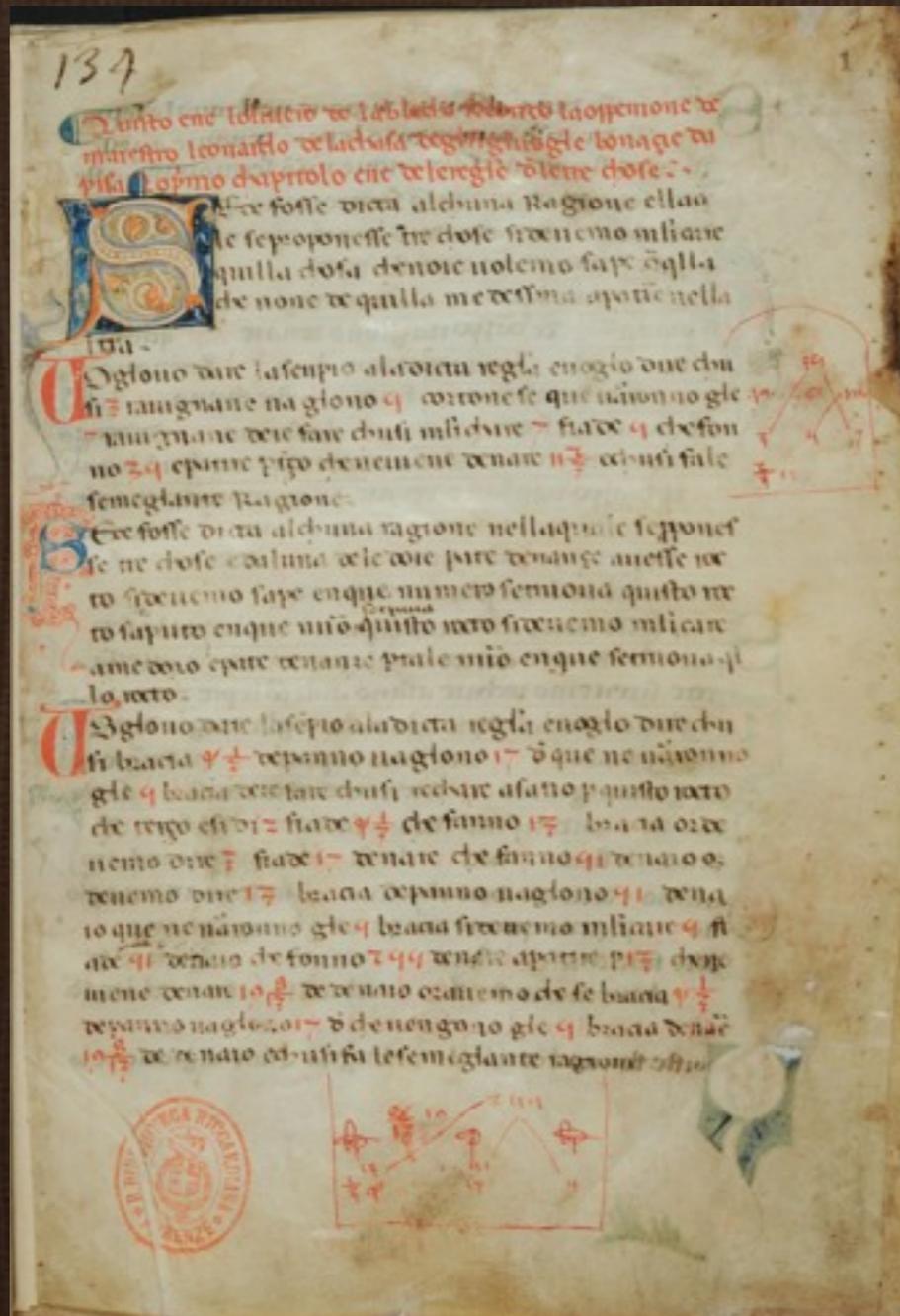
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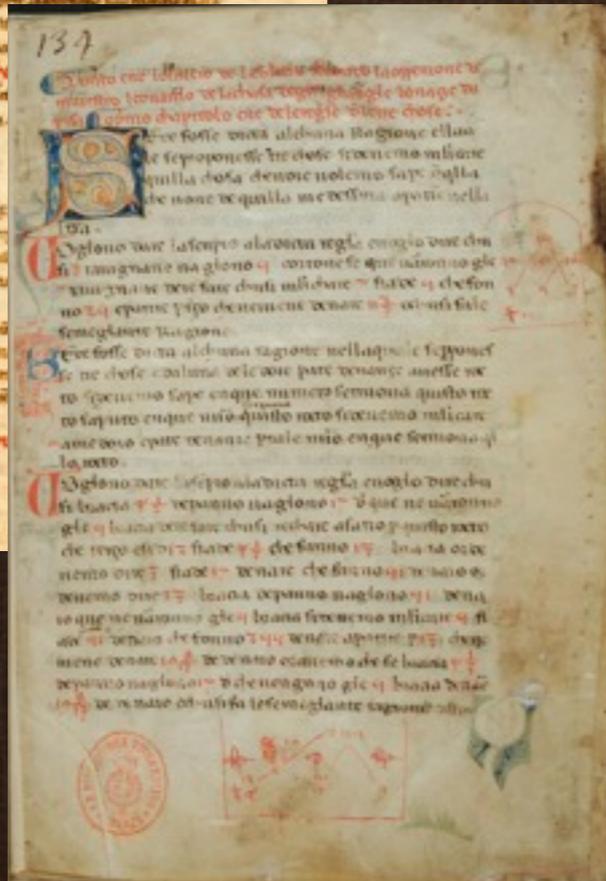
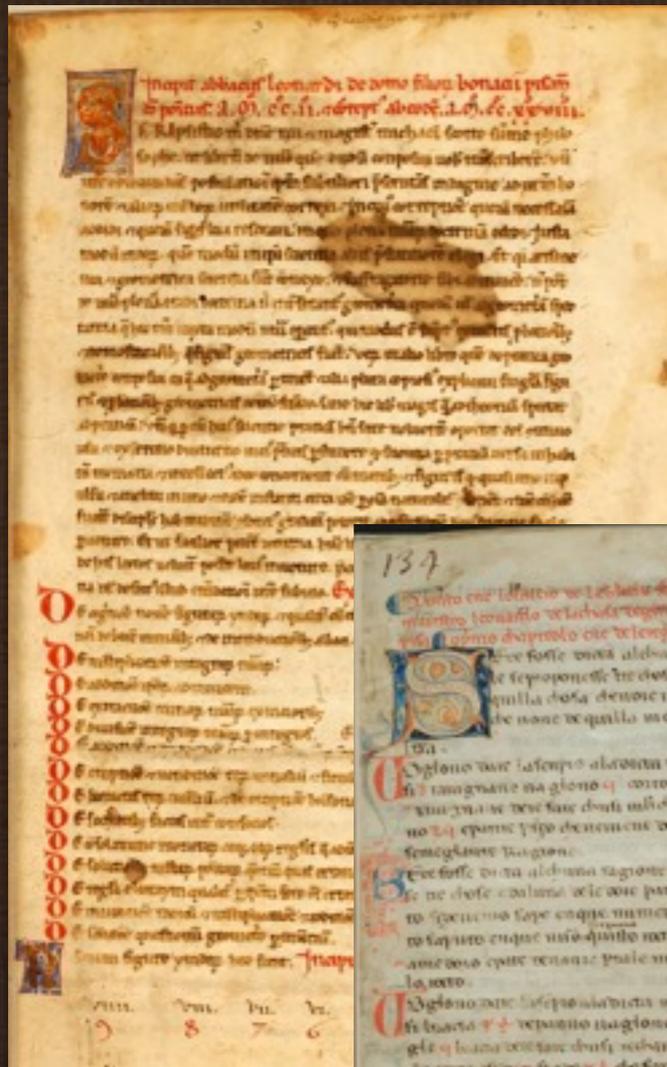
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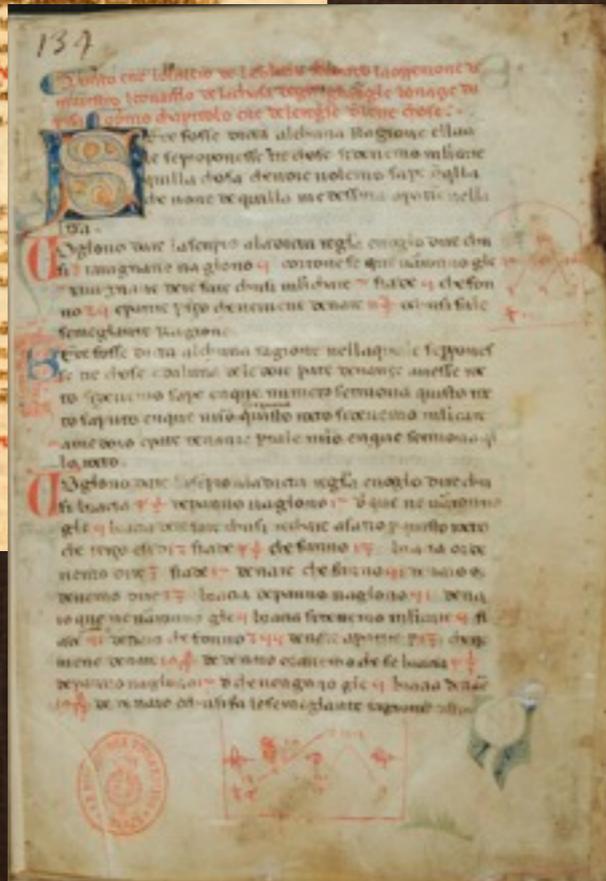
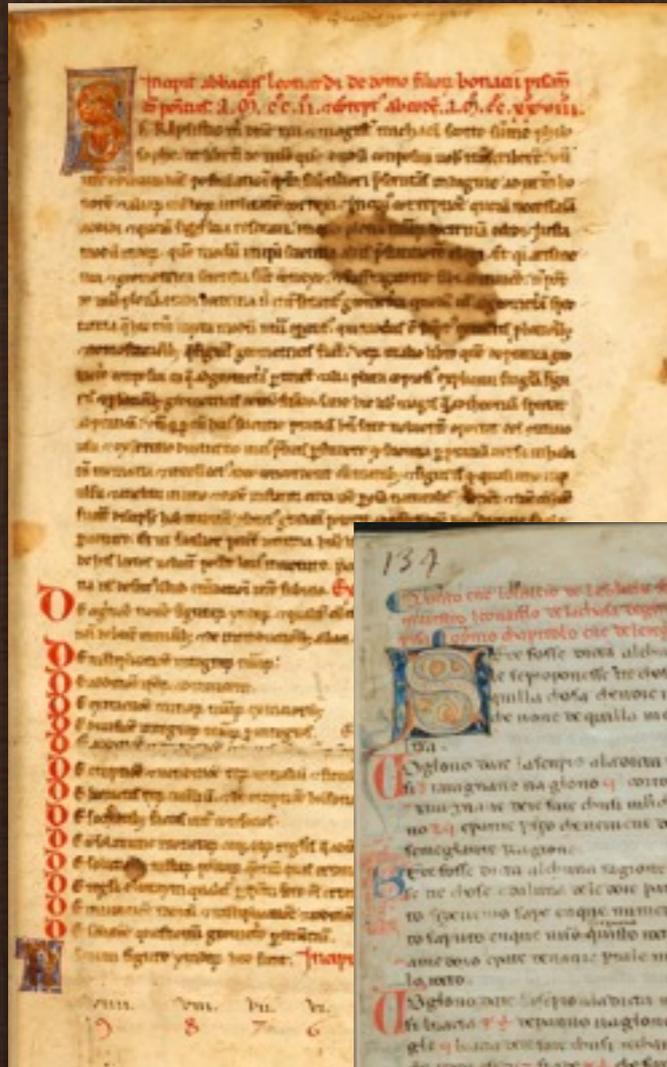
Codex 2404, Umbrian author, ca 1290

Leonardo's lost "Book for merchants"

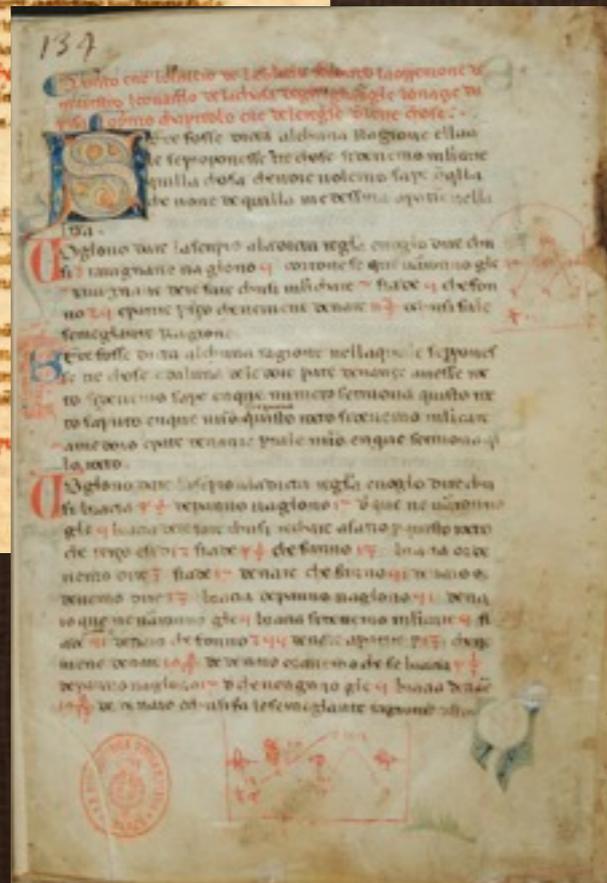
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The Siena Manuscript

Introduccionel in addectione et multiplicatione numerorū

2 et 2 fiunt	lanua quaternaria	60 et 60 fiunt 120	dequinario
2 2 4	7 et 7 fiunt 14	60 70 120	4 vias 4 fiunt 16
2 4 6	7 8 15	60 80 140	4 6 20
2 6 8	7 9 16	60 90 150	4 7 28
2 8 10	7 10 17	70 et 70 fiunt 140	4 8 32
2 10 12	8 9 17	70 80 140	4 9 36
	8 10 18	70 90 160	4 10 40
lanua ternaria	3 et 3 fiunt 6	80 et 80 fiunt 160	de senario
2 3 6	3 10 13	80 90 170	6 vias 6 fiunt 36
2 4 8	10 et 10 fiunt 20	90 et 90 fiunt 180	6 7 42
2 6 12	10 20 30	100 et 100 fiunt 200	6 8 48
2 8 16	20 20 40	100 100 200	6 9 54
2 10 20	20 30 50	100 200 300	6 10 60
	20 40 60	100 300 400	
	20 50 70	100 400 500	de septenario
	20 60 80	100 500 600	7 vias 7 fiunt 49
	20 70 90	100 600 700	7 7 49
	20 80 100	100 700 800	7 8 56
	20 90 110	100 800 900	7 9 63
	20 100 120	100 900 1000	7 10 70
	20 110 130	100 1000 1100	
	20 120 140	100 1100 1200	de octonario
	20 130 150	100 1200 1300	8 vias 8 fiunt 64
	20 140 160	100 1300 1400	8 8 64
	20 150 170	100 1400 1500	8 9 72
	20 160 180	100 1500 1600	8 10 80
	20 170 190	100 1600 1700	
	20 180 200	100 1700 1800	de nonario
	20 190 210	100 1800 1900	9 vias 9 fiunt 81
	20 200 220	100 1900 2000	9 9 81
	20 210 230	100 2000 2100	9 10 90
	20 220 240	100 2100 2200	
	20 230 250	100 2200 2300	de decenario
	20 240 260	100 2300 2400	10 vias 10 fiunt 100
	20 250 270	100 2400 2500	10 10 100
	20 260 280	100 2500 2600	
	20 270 290	100 2600 2700	
	20 280 300	100 2700 2800	
	20 290 310	100 2800 2900	
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	20 310 330	100 3000 3100	
	20 320 340	100 3100 3200	
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	20 360 380	100 3500 3600	
	20 370 390	100 3600 3700	
	20 380 400	100 3700 3800	
	20 390 410	100 3800 3900	
	20 400 420	100 3900 4000	
	20 410 430	100 4000 4100	
	20 420 440	100 4100 4200	
	20 430 450	100 4200 4300	
	20 440 460	100 4300 4400	
	20 450 470	100 4400 4500	
	20 460 480	100 4500 4600	
	20 470 490	100 4600 4700	
	20 480 500	100 4700 4800	
	20 490 510	100 4800 4900	
	20 500 520	100 4900 5000	
	20 510 530	100 5000 5100	
	20 520 540	100 5100 5200	
	20 530 550	100 5200 5300	
	20 540 560	100 5300 5400	
	20 550 570	100 5400 5500	
	20 560 580	100 5500 5600	
	20 570 590	100 5600 5700	
	20 580 600	100 5700 5800	
	20 590 610	100 5800 5900	
	20 600 620	100 5900 6000	
	20 610 630	100 6000 6100	
	20 620 640	100 6100 6200	
	20 630 650	100 6200 6300	
	20 640 660	100 6300 6400	
	20 650 670	100 6400 6500	
	20 660 680	100 6500 6600	
	20 670 690	100 6600 6700	
	20 680 700	100 6700 6800	
	20 690 710	100 6800 6900	
	20 700 720	100 6900 7000	
	20 710 730	100 7000 7100	
	20 720 740	100 7100 7200	
	20 730 750	100 7200 7300	
	20 740 760	100 7300 7400	
	20 750 770	100 7400 7500	
	20 760 780	100 7500 7600	
	20 770 790	100 7600 7700	
	20 780 800	100 7700 7800	
	20 790 810	100 7800 7900	
	20 800 820	100 7900 8000	
	20 810 830	100 8000 8100	
	20 820 840	100 8100 8200	
	20 830 850	100 8200 8300	
	20 840 860	100 8300 8400	
	20 850 870	100 8400 8500	
	20 860 880	100 8500 8600	
	20 870 890	100 8600 8700	
	20 880 900	100 8700 8800	
	20 890 910	100 8800 8900	
	20 900 920	100 8900 9000	
	20 910 930	100 9000 9100	
	20 920 940	100 9100 9200	
	20 930 950	100 9200 9300	
	20 940 960	100 9300 9400	
	20 950 970	100 9400 9500	
	20 960 980	100 9500 9600	
	20 970 990	100 9600 9700	
	20 980 1000	100 9700 9800	
	20 990 1010	100 9800 9900	
	20 1000 1020	100 9900 10000	

5b

24

par sup 2 pmi gnt de 22 rapnet 22 et 820 fmi gnt. qdnt
 de 14 remanet 14 et rep mltet 8 20 fmi gnt. duntot null. qdnt
 de 148 remanet ipa 148 et 827 fiant 96 que qdnt de 1465
 remanet 1465 qdnt sup dgl de 1007 am ipm par 208 qdnt
 queste duntot qdntat ut mltet de totat dglpnt.

Uel ut quilibet alia duntotem aut quis pperlat p hie usunt. mltet qdnt
 num p duntot. et acient sume. vnt remanet num ex duntot. qdnt
 sup dgl pnt pnt. ut mltet mltet 208 21007 duntot sup dgl
 1465 qdnt sup dgl. et si mltet sume fiant duntot num. ipm duntotem vnt
 fnt agnoscat.

Explicat capitula qntu. Inapit capitula septu.
de mltatone integrorū mltorū cū ruptis.
 Vnt aut que hie et mltet cū hie. gnt cū quolibet rupto ut
 ruptis quilibet num cū quilibet rupto ut ruptis mltare
 usunt. de hie mltatō mlti cū suo rupto ut ruptis sub
 mltatō mlti cū suo mltatō. et mlti sub mlti. mltatō sub
 mltatō. Et accipit sup dgl mlti cū suo mltatō. Et hie mlti
 mlti mltatō quilibet hie mlti qdnt cū suo mlti. Et hie mlti
 ruptis hie mlti mltatō. Et mltatō hie mltatō sup dgl mlti pfecta mlti
 mltatō hie mlti duntot pntatō mlti. mlti sub mlti dgl. mltatō hie
 mlti mlti. mlti cū mltatō mltatō. et ut hie mltatō hie mltatō
 hie mlti mltatō.

de capitula mltatō ac mltatō.
 Cū pnt cū mltatō mlti integrorū cū uno rupto sub una dgl.
 Cū de mltatō mlti mlti cū duntot. et hie ruptis sub una dgl.
 Cū de mltatō mlti cū duntot ruptis sub una dgl.
 Cū de mltatō mlti cū duntot dgl cū hie ruptis.
 Cū de mltatō mlti cū hie dgl.
 Cū de mltatō ruptis sine laet. a
 Cū de mltatō pnt mlti ruptis. b
 Cū de mltatō mlti ruptis qdnt fiant mlti. a

S Inapit pnt pnt de mltatō mlti integrorū cū uno rupto sub una dgl.
 Inapit mlti ut mltatō pnt. de hie mltatō mlti sub
 mltatō. $\frac{1}{2}$ 22 sub $\frac{1}{2}$ ut hie mltatō. de hie mltatō de $\frac{1}{2}$ ut
 sup ruptis qdnt ut mltatō hie mlti ut pnt sub dgl
 pnt ipa ut mltatō pnt. qdnt sup dgl. et erit mlti ut duntot $\frac{1}{2}$
 et 22 de hie 22 sup $\frac{1}{2}$ ut mltatō pnt. mlti mltatō mltatō
 plus dgl. mlti pnt sub dgl. pnt et fiant 66 duntot. qdnt sup
 et fiant 7 qdnt sup $\frac{1}{2}$ et hie fiant ipm $\frac{1}{2}$ et mltatō duntot
 et pnt 67 erit fiant 191. quilibet duntot pntatō quilibet mlti
 hie mlti. et 22 et 22 que duntot hie mlti. et 22 et 6 mlti duntot 191
 qdnt ut mlti 2246 pntatō mltatō ut mltatō duntot duntot.

22
$\frac{1}{2}$ 11
67
$\frac{1}{2}$ 22
$\frac{1}{2}$ 246

24a

The Florence Manuscript

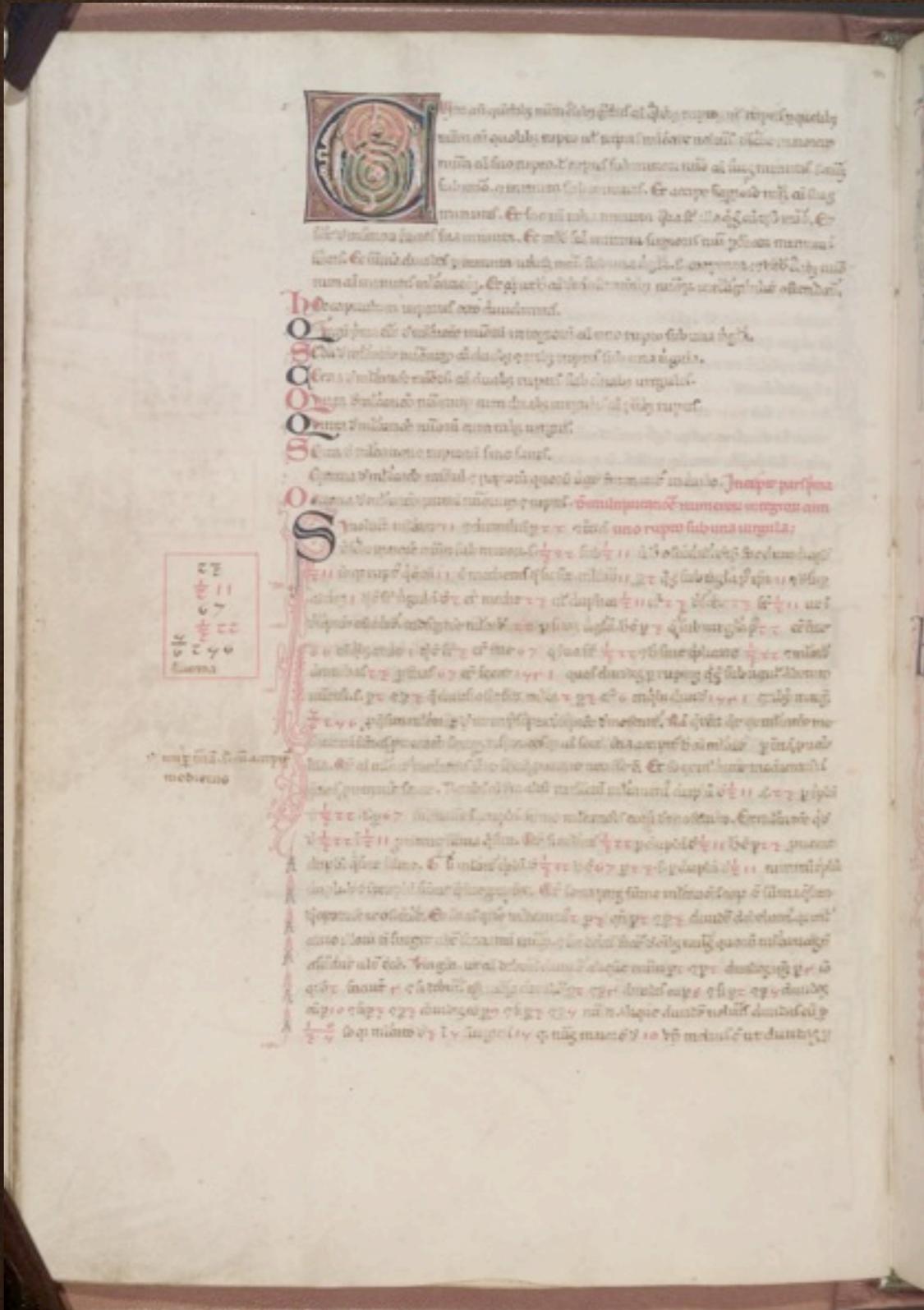
Manuscript page 4a contains a grid of numerical tables. The tables are organized into several sections, each with a title in red ink. The tables consist of columns of numbers, some with red ink and some with black ink. The tables are arranged in a grid-like fashion, with some tables having multiple columns and rows. The numbers are written in a medieval script, and the tables appear to be related to arithmetic or algebra. The red ink is used for titles and some numbers, while black ink is used for the main content of the tables.

4a

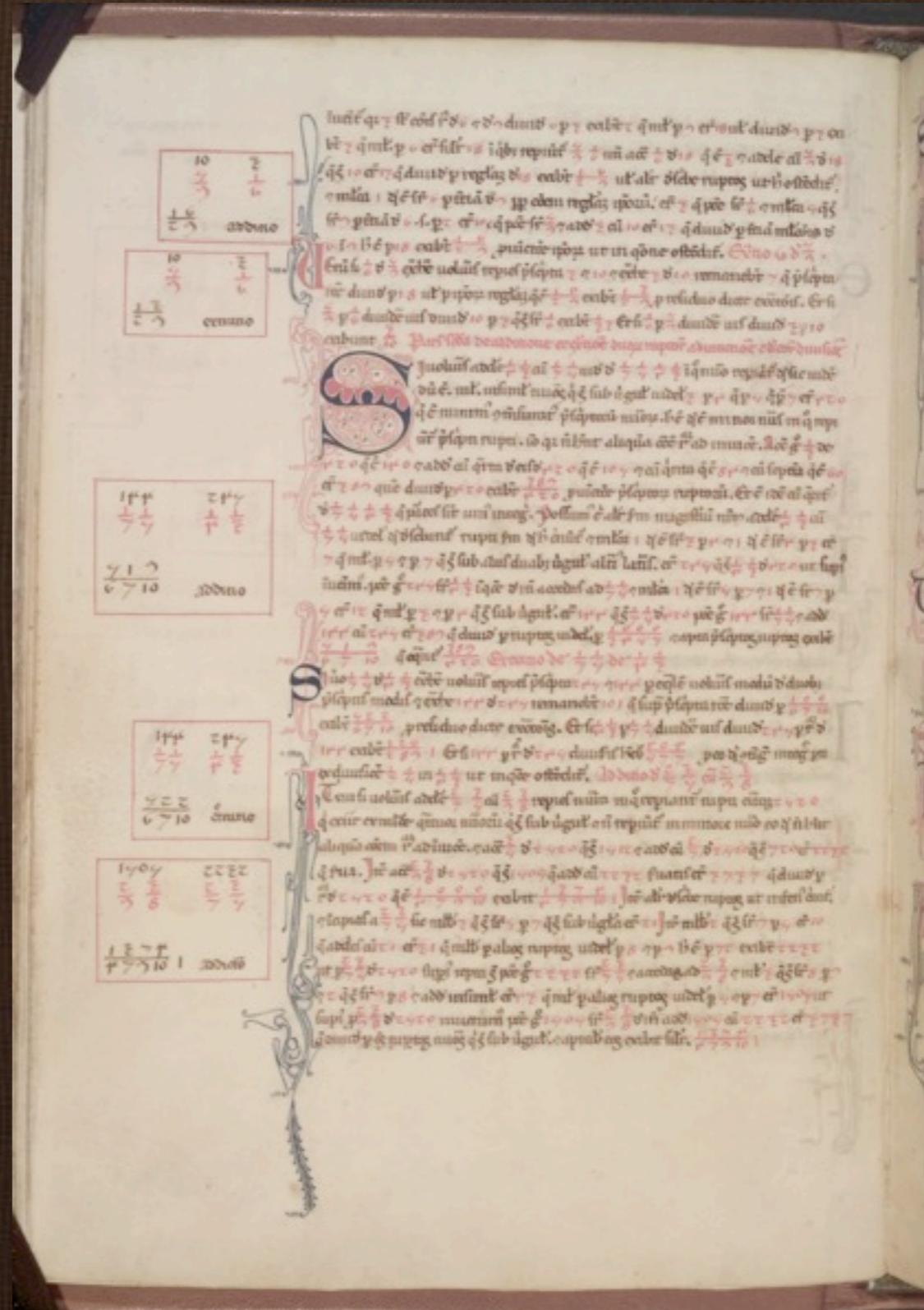
Manuscript page 14b features a large block of text in a medieval script, likely Latin. The text is written in black ink and is interspersed with several diagrams and tables. The diagrams are drawn in red ink and consist of trapezoidal shapes with numbers inside. The tables are also drawn in red ink and contain numbers. The text appears to be a commentary or explanation of the mathematical concepts shown in the diagrams and tables. The overall layout is dense and typical of a medieval manuscript.

14b

The Florence Manuscript

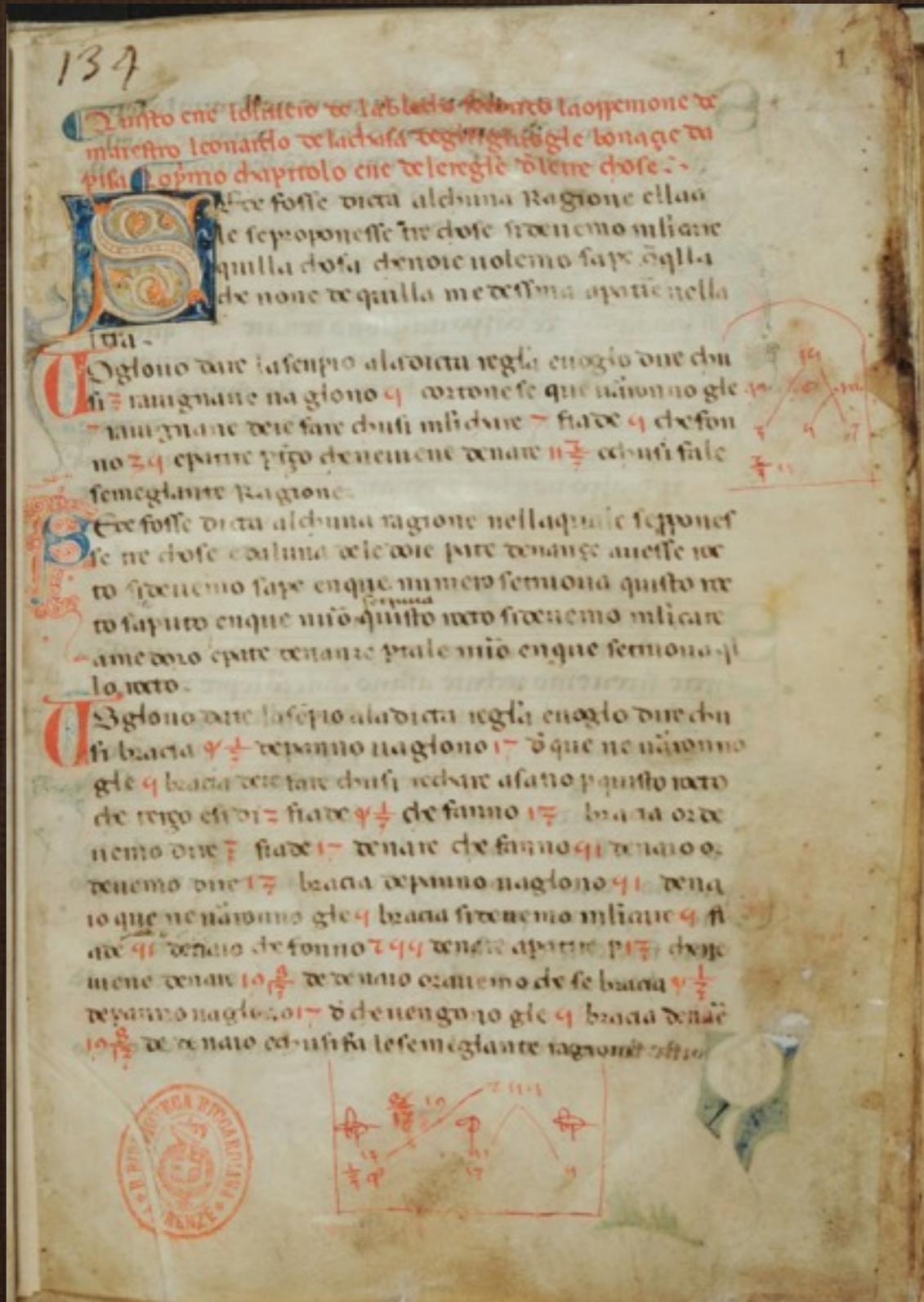


20a

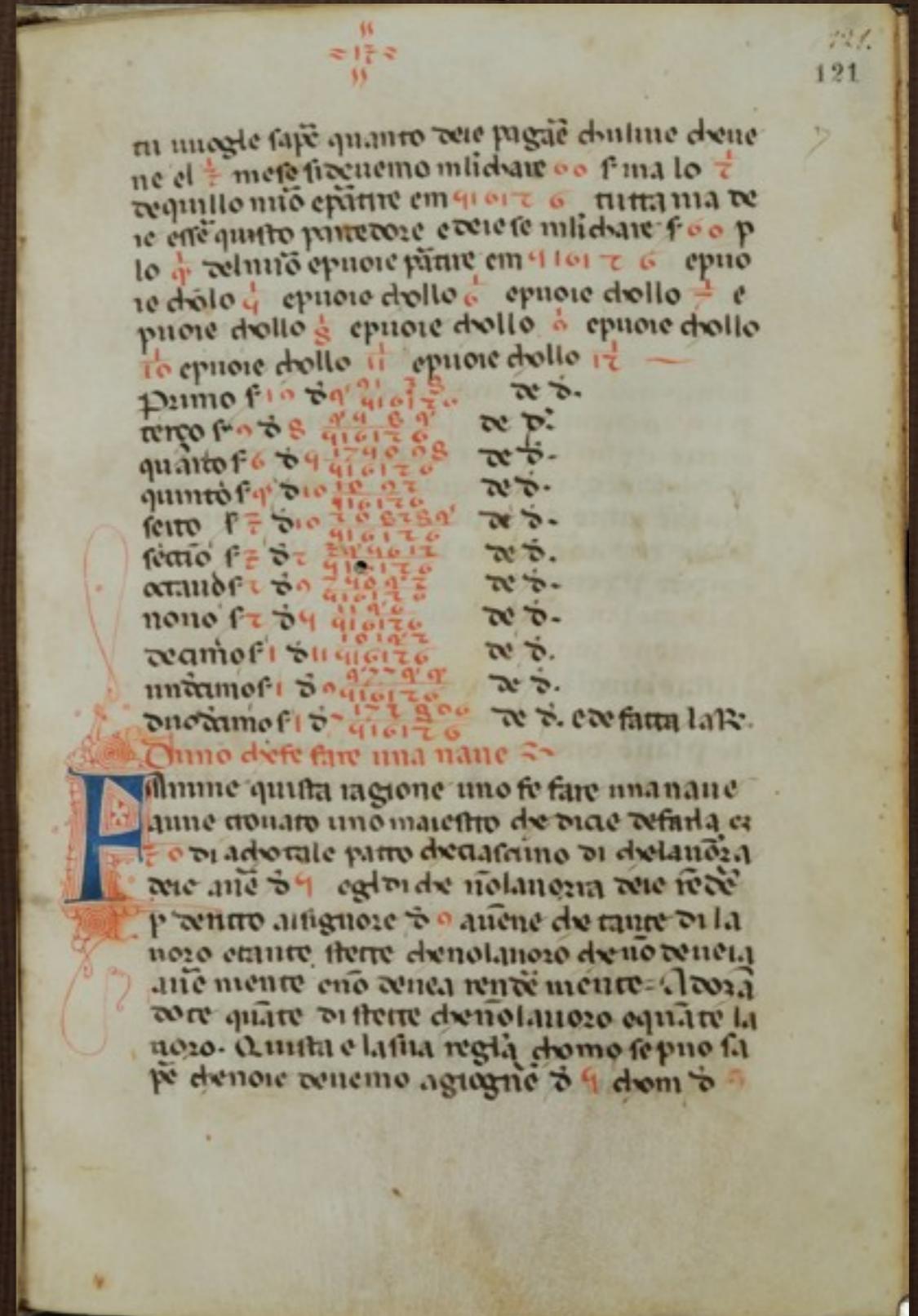


27b

The Riccardiana Manuscript



001r



121r

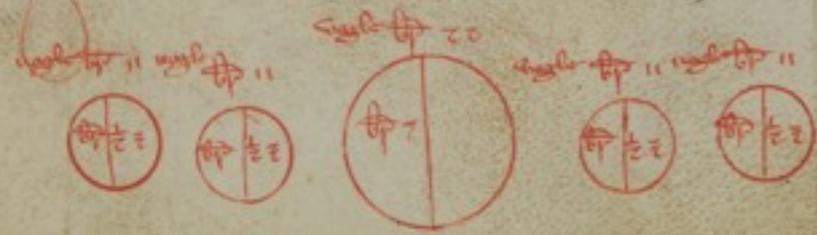
The Riccardiana Manuscript

p $\frac{1}{2}$ = defa $\frac{1}{2}$ b $\frac{1}{2}$ edo tanto uogleru tutto
quisto rotondo epquisto modo puoie fare
tutte quiste ragione etutta ma pigla egle
 $\frac{1}{2}$ detutta la soma e agiongne sopra d $\frac{1}{2}$
ditto auemo de uante.

Sue fosse ditto euno rotondo chel suo di
ametro ene b $\frac{1}{2}$ 10 enoie uolemmo sape q
te b $\frac{1}{2}$ quadre fosse ano sapendo quillo che
uoglesse dentro no. quista e la sua regla
che deuemo mli dare 10 ma 10 che fa 100
b $\frac{1}{2}$ deglequagle b $\frac{1}{2}$ 10 deuemo abatte gle
 $\frac{1}{2}$ che souno $\frac{1}{2}$ 71 or deuemo trare de bia
100 quisto $\frac{1}{2}$ 71 erma ma b $\frac{1}{2}$ $\frac{1}{2}$ 78 edo ta
te b $\frac{1}{2}$ qua dre sira tutto quisto rotondo e
p quisto modo puoie fare tutte le seme gla
te ragione gae tascbe tusaie quillo che p
lo diametro de mego mli da e dela soma a
batte gle $\frac{1}{2}$ euertate aponto.

Sue fosse ditto euno rotondo che uogle de
torno b $\frac{1}{2}$ 22 unde ne uoglo fare q' retonde
e sape quato uoglea a cascuno p se. quista
ene la sua regla che uoie deuemo pigla e
lamita de b $\frac{1}{2}$ 22 che 11 b $\frac{1}{2}$ edo tanto uogle
a cascuno de quiste q' etutta ma p $\frac{1}{2}$ te la
soma p mego edo tanto uoglea p quato.

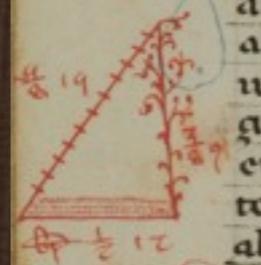
Esel auolemo prouare si deuemo sape qua
te b $\frac{1}{2}$ quadre sira a cascuno en quisto modo
che deuemo sape lo diametro lozo donqua
deuemo patire b $\frac{1}{2}$ 11 p $\frac{1}{2}$ = che nouene $\frac{1}{2}$ =
edo tanto el suo diametro de mego mo



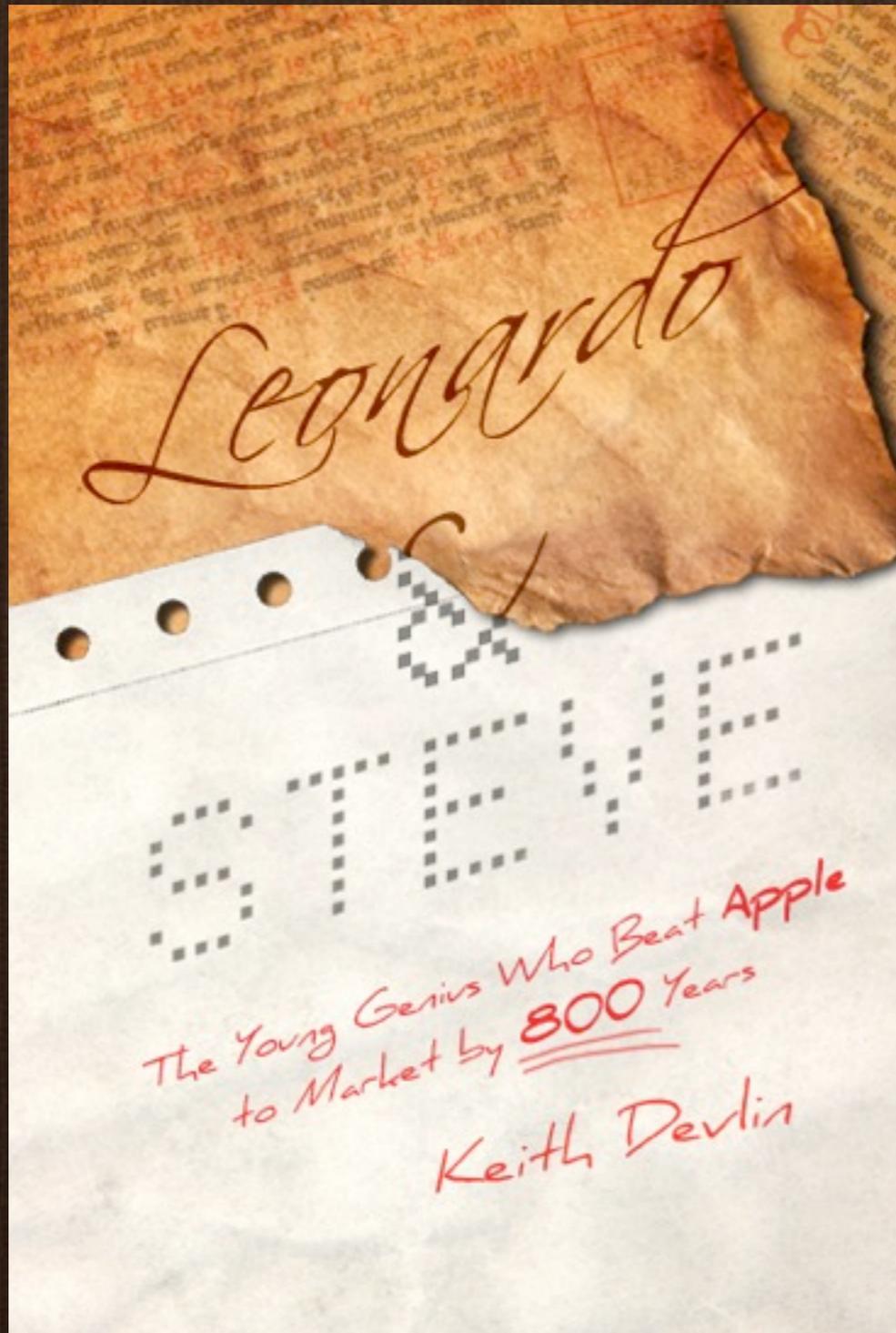
Sue fosse ditto euno fiume loquale fiume
ebi $\frac{1}{2}$ 12 eda lato chanto del fiume sista
uno abore loqua le no sapemo quato sira al
to un fio no glo fare una schala de giog
dala nra del fiume entro ala cima de la bore
adomadore quato calto la bore equa to sira
alta la schala. quista e la sua regla che noie d
uemo piglare el $\frac{1}{2}$ delala gega del fiume
gae de b $\frac{1}{2}$ 12 che b $\frac{1}{2}$ = eglequagle agiog
emsieme dom b $\frac{1}{2}$ 12 efam b $\frac{1}{2}$ 19 edo ta
to sira grande la schala ep sape quanto sira
alto la bore si deuemo trare el $\frac{1}{2}$ b $\frac{1}{2}$ 12
che $\frac{1}{2}$ = e lre manete sira $\frac{1}{2}$ = edo tanto sira
alto la bore.

Esel auolemo prouare si deuemo mli dare
la la gega del fiume p seme desmo edue $\frac{1}{2}$ =
ua $\frac{1}{2}$ = che fa b $\frac{1}{2}$ 146 mo deuemo mli dare
lozo de la bore edue $\frac{1}{2}$ = ua $\frac{1}{2}$ = che fa $\frac{1}{2}$ =
86 eglequagle agiongne emsieme cho b $\frac{1}{2}$
 $\frac{1}{2}$ 146 te efam b $\frac{1}{2}$ 244 deglequagle deuemo
trouare la sua radice che $\frac{1}{2}$ 146 domo uole
essere edusi sale seme glante ragione ap $\frac{1}{2}$ to.

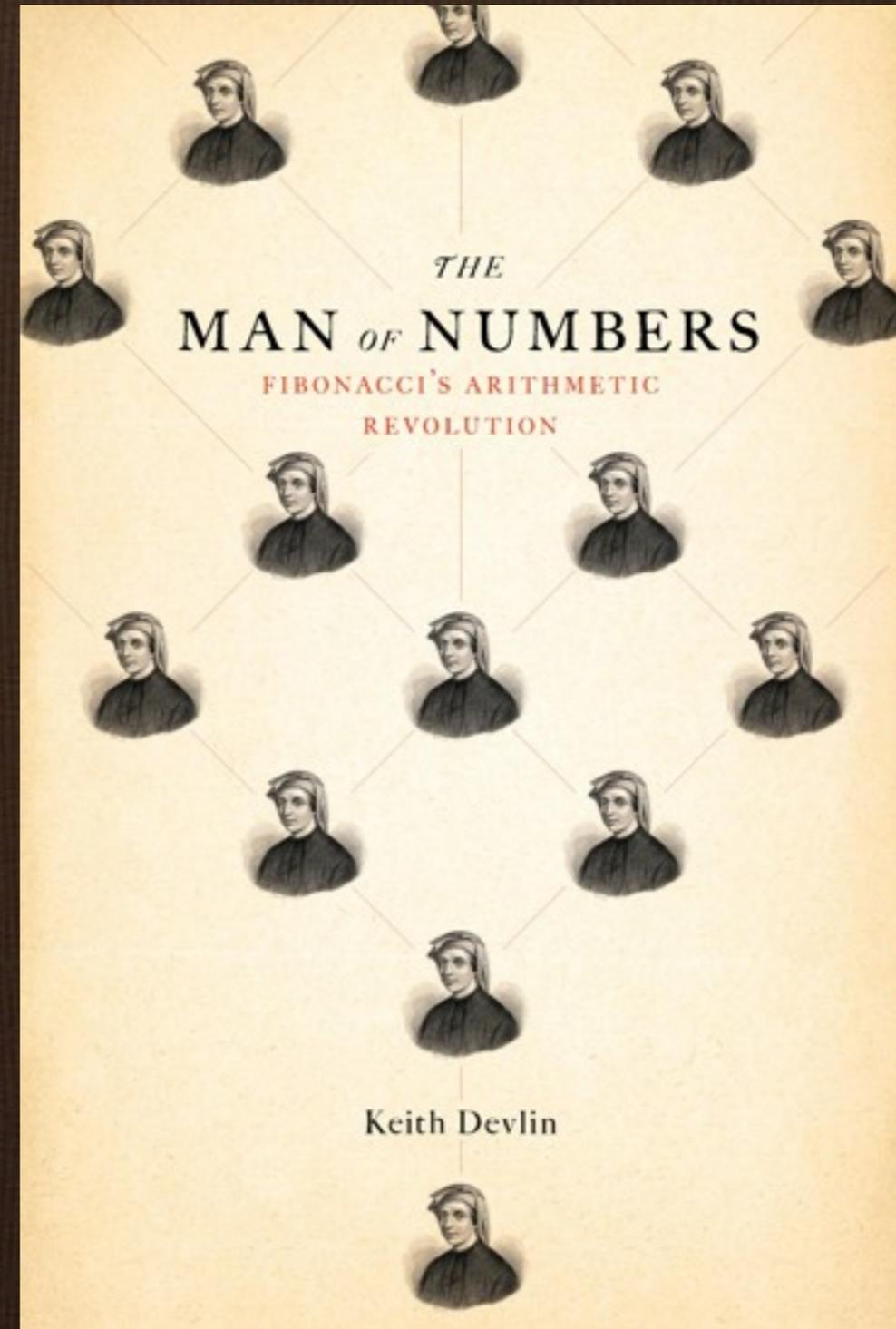
Sue fosse ditto che uno arbora alto b $\frac{1}{2}$ 29
euno fiume capie de la bore edio no glo po
ne una schala dala cima de la bore ala poma
del fiume adomadore quato sira largo el fi
ume equa to sira larga la schala aponto. qui
sta e la sua regla gae che noie deuemo pigla
re el $\frac{1}{2}$ delala gega de la bore gae de b $\frac{1}{2}$ 29
che b $\frac{1}{2}$ 8 egiogne sopra abi $\frac{1}{2}$ 29 efam b $\frac{1}{2}$



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