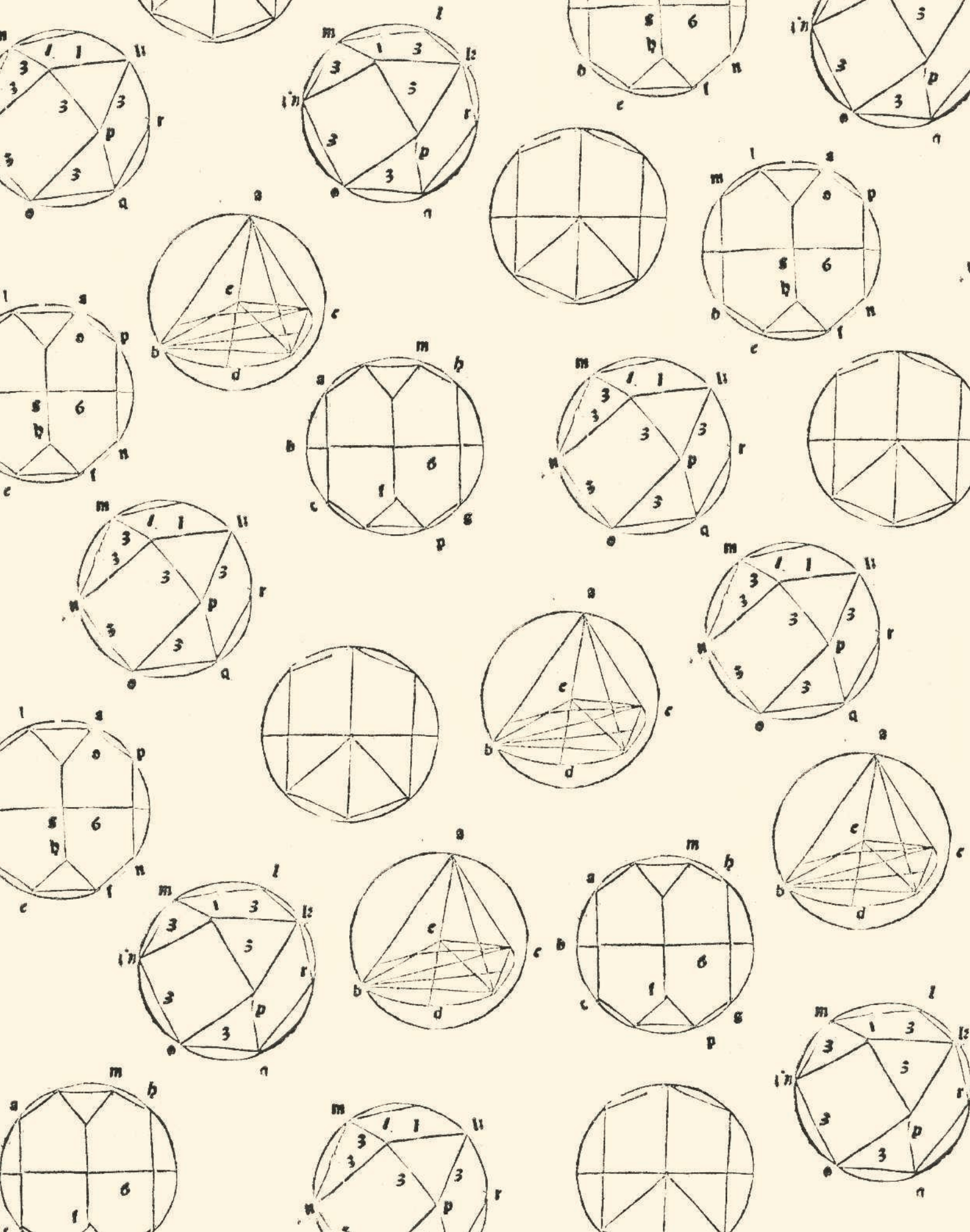
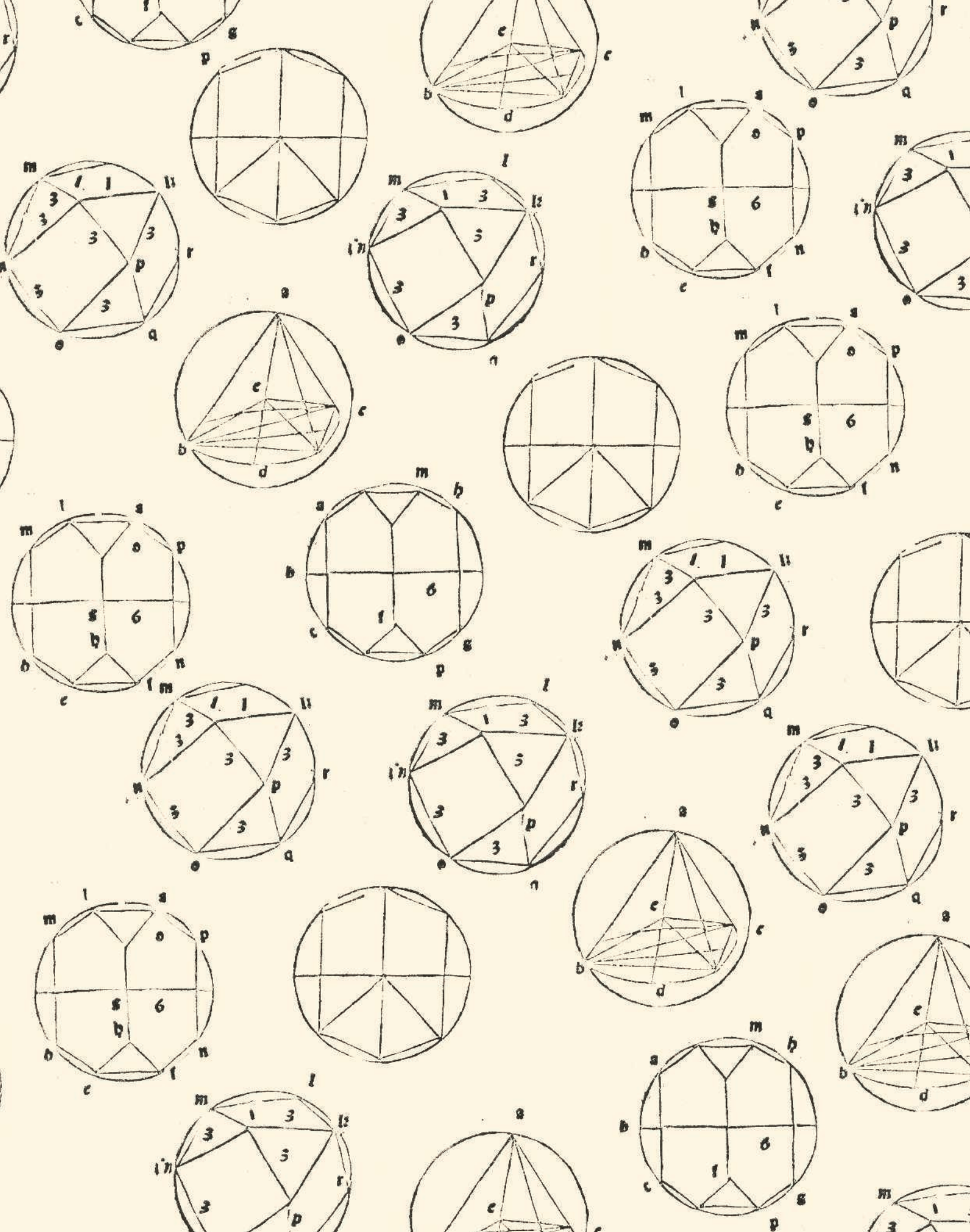


SUMMA DE ARITHMETICA
THE BIRTH OF MODERN BUSINESS

New York 12 June 2019

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SPECIALISTS AND SERVICES FOR THIS AUCTION



Margaret Ford
International Head of Group
+ 44 207 389 2150
mford@christies.com



Christina Geiger
Head of Department
+1 212 636 2667
cgeiger@christies.com



Rhiannon Knol
Associate Specialist
+1 212 636 2664
rknol@christies.com



J. Fernando Peña
Senior Specialist
+1 212 636 2663
jfpena@christies.com

HEAD OF SALE

Christina Geiger
cgeiger@christies.com
Tel: +1 212 636 2667

SALE COORDINATOR

Gillian Hawley
gillianhawley@christies.com
Tel: +1 212 636 2665
Fax: +1 212 636 4928

HEAD OF SALE MANAGEMENT

Lauren Carlucci
lcarlucci@Christies.com
Tel: +1 212 641 7535

ABSENTEE AND TELEPHONE BIDS

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Leah Kuttruff
Post-Sale Coordinator
Payment, Shipping and Collection
Tel: +1 212 636 2650
Fax: +1 212 636 4939
Email: PostSaleUS@christies.com

INTERNATIONAL PRINTED BOOKS AND MANUSCRIPTS & SCIENTIFIC INSTRUMENTS DEPARTMENTS

INTERNATIONAL HEAD OF GROUP

Margaret Ford
Tel: +44 207 389 2150

INTERNATIONAL MANAGING DIRECTOR

Karl Hermanns
Tel: +44 207 389 2425

INTERNATIONAL CONSULTANT

Felix de Marez Oyens
Tel: +33 1 40 76 85 58

BOOKS AND MANUSCRIPTS

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Barbara Scalvini
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PARIS

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SCIENTIFIC INSTRUMENTS

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Email. First initial followed by last name@christies.com
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3-5 JULY 2019

BIBLIOTHÈQUE
PAUL DESTRIEUX
PREMIÈRE PARTIE
PARIS

9 JULY 2019

THE GOLDEN AGE OF
RUSSIAN LITERATURE:
A PRIVATE EUROPEAN
COLLECTION
LONDON

9 JULY 2019

IMPORTANT SCIENTIFIC
BOOKS FROM THE
COLLECTION OF PETER AND
MARGARETHE BRAUNE
LONDON

10 JULY 2019

THE HISTORY OF WESTERN
SCRIPT: IMPORTANT
ANTIQUITIES AND
MANUSCRIPTS FROM THE
SCHØYEN COLLECTION
LONDON

10 JULY 2019

VALUABLE BOOKS &
MANUSCRIPTS
LONDON

18 JULY 2019

ONE GIANT LEAP:
CELEBRATING SPACE
EXPLORATION 50 YEARS
AFTER APOLLO 11
NEW YORK

31 OCTOBER 2019

FINE PRINTED BOOKS &
MANUSCRIPTS INCLUDING
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NEW YORK

SUMMA DE ARITHMETICA THE BIRTH OF MODERN BUSINESS

WEDNESDAY 12 JUNE 2019

AUCTION

Wednesday 12 June 2019

At 2.00 pm

20 Rockefeller Plaza

New York, NY 10020

VIEWING

Friday	7 June	10.00 am – 5.00 pm
Saturday	8 June	10.00 am – 5.00 pm
Sunday	9 June	1.00 pm – 5.00 pm
Monday	10 June	10.00 am – 5.00 pm
Tuesday	11 June	10.00 am – 5.00 pm

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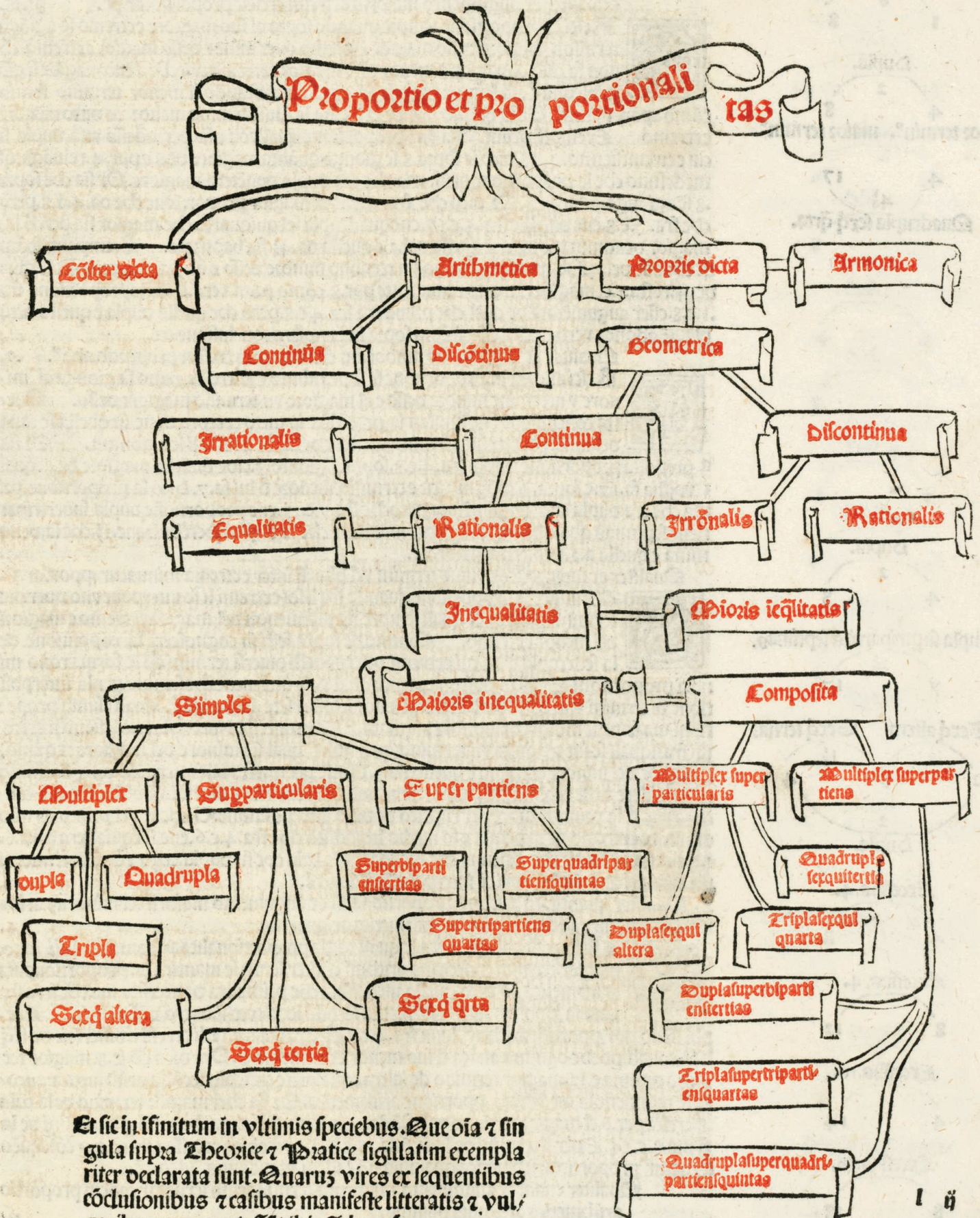
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CHRISTIE'S



Et sic in infinitum in vltimis speciebus. Que oia 7 singula supra Theorice 7 Praticce sigillatim exemplariter declarata sunt. Quaruz vires ex sequentibus cõclusionibus 7 casibus manifeste litteratis 7 vulgaribus apparent. Et ibi. Ideo zc.

Foreword

Dr. Keith Devlin, Stanford University

Luca Pacioli's *Summa de arithmetica, geometria, proportioni et proportionalita* ("Summary of arithmetic, geometry, proportions and proportionality") is one of the most influential texts in the history of mathematics, commerce, and finance. In particular, it established the now standard accounting practice of double-entry bookkeeping, leading to Pacioli being often referred to as the "father of accounting." Written in vernacular Italian, this mammoth text (615 pages in the first edition) was first published in Venice in 1494.

When we look back at the development of human society, we tend to see major leaps forward initiated by a single individual or a small group, with longer periods of more steady progress. The bold initiators who launch society on a new path seem like superhuman geniuses, made of different mental stuff than the rest of us. But, in fact, each major leap forward is always a cumulative effect resulting from many individuals, each making small steps over years, decades, and even centuries. The intellectual giants we see absolutely deserve credit for what they did, but they are still mortals. As one of the greatest "giants" of all, Isaac Newton, famously and revealingly said, "If I have seen further than others, it is by standing upon the shoulders of giants."

What those giants did that resulted in their names being prominent in the history books is bring together many accumulated small advances, interpret and synthesize them into a whole, and then *package* that whole in a fashion that is readily accessible to others less immersed in the details and the history. In some cases, among them Archimedes (around 250 B.C.E.), Newton (seventeenth-century), and Einstein (twentieth-century), the influencers brought their own originality into the synthesis.

With others, though their own original work was in many cases significant, it was solely their synthesis and packaging of the work of others that they are known for. Such was the case for Euclid (whose mammoth text *Elements*, ca 350 B.C.E., established the modern canons of geometry and number theory), al-Khwārizmī (who wrote the ninth-century text that established algebra as a widely used tool in commerce and then later in engineering and science), Leonardo

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of Pisa (a.k.a. Fibonacci, whose book *Liber abbaci*, written in 1202, brought Hindu-Arabic arithmetic and algebra to the West), and Pacioli with his *Summa*. Though each of these authors produced other books where they presented their own work, it was the breadth and accessible quality of their expository works that changed the course of human history.

The same is true today with technology. The two giants who changed the world in the 1980s are Steve Jobs and Bill Gates. But neither made any breakthroughs in the design of computers or the creation of software systems. Rather, they took the best of what was available and packaged it in a way that millions of others could use. In the worlds of science, mathematics, and engineering, professional culture directs admiration towards the innovators who come up with new ideas, and tends to downplay or even dismiss the individuals who package those new ideas into an accessible form that others can use. But both are required in order to change the world.

It is, then, as a "packager" that we must view Pacioli in order to recognize the major impact he had on the course of history.

Luca Pacioli was born between 1446 and 1448 in the Tuscan town of Sansepolcro, where he received an abbaco education, the package of commercially-oriented Hindu-Arabic arithmetic, practical geometry, and trigonometry that had been common in Italy since the appearance of Fibonacci's *Liber abbaci* in 1202. With texts written in the vernacular rather than the Latin used by scholars, abbaco focused on the skills required by merchants. Around 1464, Pacioli moved to Venice, where he worked as a tutor to the three sons of a merchant.

In many respects, *Summa* is little more than an updated, vernacular version of Fibonacci's *Liber abbaci*, which itself was an updated Latin translation of al-Khwārizmī's Arabic books on arithmetic and algebra. But two factors resulted in *Summa* having a degree of impact that greatly exceeded those two earlier works.

First, thanks to the recent invention of the printing press, *Summa* was the first major *printed* mathematics text, a format that could be duplicated and sold on a wide scale. In the days when texts were

The reason people today associate mathematics with symbols is a result of the printing press. Before then, mathematics was a subject presented in prose.

hand-written, authors of mathematics texts avoided any use of the abstract symbols they used to do calculations—other than the basic numerals—because they could not rely on accurate copying of formulas and equations by the scribes who made copies. But with print, there was nothing that prevented them having entire pages consisting of little else than formulas and equations. The reason people today associate mathematics with symbols is a result of the printing press. Before then, mathematics was a subject presented in prose.

Indeed, as I recounted in my 2011 book *The Man of Numbers: Fibonacci's Arithmetic Revolution*, we would today not know about Fibonacci's work and the major role it played in the development of the modern world, were it not for Pacioli's acknowledgement that *Summa* was based largely on his teachings. The thirteen whole or fragmentary handwritten *Liber abbaci* manuscripts that are now treasured items in the libraries lucky enough to have them would likely still be gathering dust in archives. That they are not is due to Pietro Cossali, an Italian mathematician in the late eighteenth century, who came across the reference to Fibonacci while studying *Summa* in the course of researching a mathematical history book he was writing. Intrigued by Pacioli's brief reference to an unknown "Leonardo Pisano" as having been the source for most of the contents of *Summa*, Cossali began to look for the Pisan's manuscripts, and in due course learned from them of Fibonacci's important contribution. A French historian subsequently invented a surname for the newly rediscovered Leonardo of Pisa: "Fibonacci," and thereby gave rise to a modern-day mathematics legend.

As a printed book, *Summa* achieved a far wider readership than *Liber abbaci*, or any of the other handwritten manuscripts that were based on it. And so its impact was far greater. For that, Pacioli was simply

This book also introduces the “Rule of 72” for predicting an investment’s future value, a technique that anticipated the development of the logarithm over a century later.

lucky that he wrote his book after the printing press became available. On the other hand, we can definitely credit Pacioli for the other factor that made *Summa* unique: his inclusion of a book on accounting.

As with *Liber abbaci*, *Summa* was more than a business person’s “how to” manual. Both were scholarly mathematical texts, written in the rigorous logical fashion of Euclid’s *Elements*.

Summa consists of ten books covering essentially all of Renaissance mathematics. The first seven books form a summary of arithmetic; book 8 explains contemporary algebra (initiating the use of logical argumentation and theorems in studies of the subject); book 9 covers various topics relevant to business and trade (including barter, bills of exchange, weights and measures, and bookkeeping); and book 10 describes practical geometry and trigonometry. As I noted earlier, none of the methods described are due to Pacioli himself; his contribution—which was significant—was the comprehensive, comprehensible exposition.

Significantly, *Summa* was also the first printed book to codify and give a comprehensive explanation of modern, double-entry bookkeeping, a system of accounting with a long history going back to Jewish bankers in Cairo in the eleventh century (maybe earlier), and used by Italian merchants and bankers, including the Medici in Florence, throughout the fourteenth and fifteenth centuries.

Pacioli clearly viewed book 9 as significant, devoting 150 pages to the coverage of mathematical techniques for business. It is in this book, titled *Particularis de computis et scripturis* (“Details of calculation and recording”), that he describes the accounting methods then in use

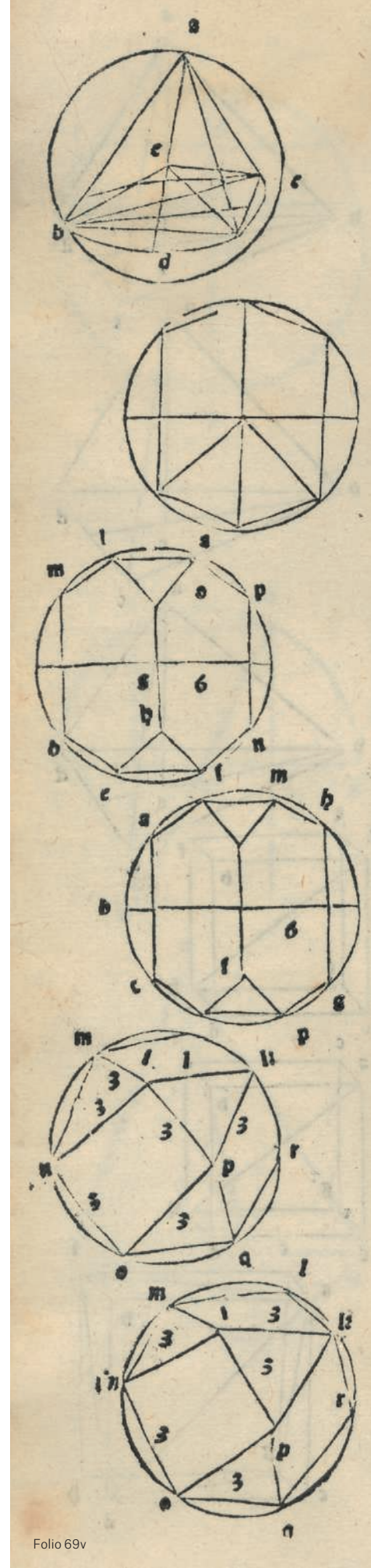
among northern-Italian merchants, including double-entry bookkeeping, trial balances, balance sheets, and various other tools still employed by accountants today. This book also introduces the “Rule of 72” for predicting an investment’s future value, a technique that anticipated the development of the logarithm over a century later.

In deciding to include a substantial book on business techniques, Pacioli was simply reflecting the local needs of the time, just as al-Khwārizmī wrote his algebra book in response to the changing practices of the merchants around him in ninth-century Baghdad, who were developing ways to “scale up” arithmetic to handle multiple trades where the same calculation was being repeated often with different numbers.

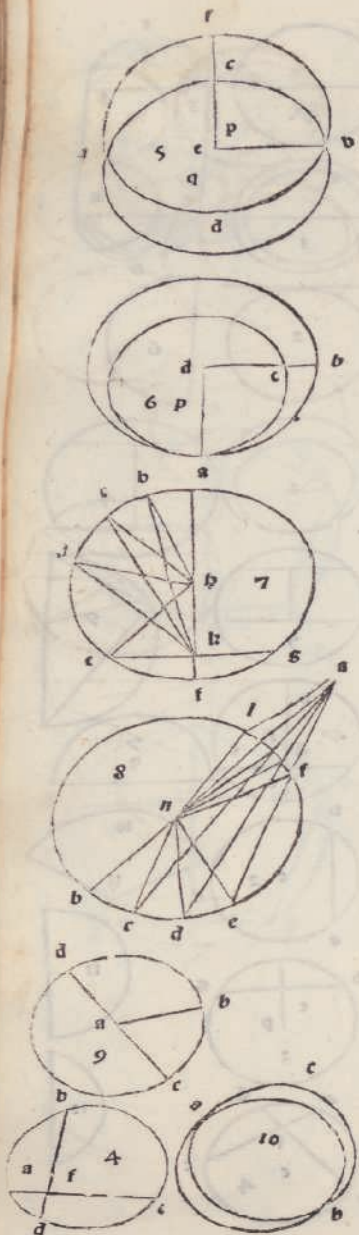
In Florence, the Medici were using double-entry accounting to keep track of the many complex transactions moving through accounts. As a result, the Medici Bank was able to expand beyond traditional banking activities of the time, setting up branches elsewhere and offering customers investment opportunities, as well as making it easy to transfer money across Europe using exchange notes that could be bought in one country and redeemed elsewhere. The mathematically-driven financial expertise of the Medici enabled them to build client loyalty and dominate the financial world at a time when Florence was the center of world trade.

Pacioli’s *Summa* showed others how it was done. He was surely writing a book for which he knew there was a great demand. In short, *Summa* did for accounting what *Liber abbaci* had done for Hindu-Arabic arithmetic: made it go mainstream, presenting it in a way that enabled ordinary people (at least those with some facility with numbers) to master the mathematical techniques required for finance and commerce.

Dr. Keith Devlin is an emeritus mathematician at Stanford University, where he currently directs the Stanford Mathematics Outreach Project in the Graduate School of Education. He is also “the Math Guy” on National Public Radio.



Distinctio quarta. Capitulum primum.



per lo centro: yn altrà ne meno dal centro. p. e passa per lo ponto. e. loquale e in mezzo dela linea. b. g. dico laline. p. e. essere perpendiculare ala linea. b. g. E ancora quando laline. p. e. viene dal centro e sia perpendiculare ala linea. b. g. dico aloza laline. b. g. essere diuisa per. 2. parti uguali chera bisogno intendere. 4. Quando in vno cerchio sonno. 2. linee e che in fra loro si segbino e alcuna diloro nò passi pel centro: certamente non si segberanno per parti uguali. Lomme sia nel cerchio. a. b. c. d. Del quale il centro sia. e. laline. a. c. e. d. b. sequali in fra loro si segbino nel ponto. f. e non passi alcuna diloro per lo cetro. Dico che. b. f. nòne igna li al. f. d. ne il. e. f. al. f. a. comme chiaro appare. 5. E centri di. 2. cerchi che in fra loro se inter segano nonne vno medesimo ma sonno diuersi. Lomme siemo. 2. cerchi. a. e. b. e. a. b. d. se gantesi sopra. 2. ponti. a. e. b. Dico che loro centri sonno diuersi. Impero che se fossino vno sia quello il centro. e. E menise le linee ala circonferentia cioe. e. a. e. f. e. c. doue per la diffinitio ne de cerchio. e. f. e. c. sianno uguali. La parte al tutto che e impossibile. E pero hano diuersi cetri cioe. p. e. q. chera bisogno mostrare.

H Cerchi che sonno contingenti infra loro non hanno vno medesimo centro ma diuersi. Lomme siemo. 2. cerchi. a. b. c. a. c. che si toccano nel ponto. a. Dico che i loro sonno diuersi centri. Impero che se fossino vno medesimo che ponga fosse d. emense. d. a. e. d. e. d. b. uguali che e impossibile: cioe la parte al tutto. Adanca hano cetri diuersi che e. d. e. p. chera bisogno mostrare.

S E nel diametro dun cerchio si segna vn ponto fuor del centro. E da quello ala circonferentia piu simeuno: quella che passera per lo centro sira magiore dalcuna delaltre. E quella che compira el diametro sira di ciascuna magiore. E quelle che piu sacostano al centro sonno magiori delaltre che meno sacostano. E quanto piu sonno remore dal centro tanto sonno magiori delaltre che meno sacostano collaterali al ponto: cioe che gli angoli dal ponto exauesi sonno uguali quelle. 2. linee equidistanti no uguali. Lomme sia nel cerchio. a. e. f. segnato nel diametro. a. al ponto. k. fuor del centro. ciascuna magiore. E perche. k. f. il compimento del diametro e di ciascuna magiore. E di k. b. che piu presso al centro dela linea. k. e. e magiore di quella. E laline. k. d. perche e piu re re del. k. d. E perche le. 2. linee collaterali e quediuguali. e. k. e. k. g. hano gli angoli uguali: fo ta campata docha.

S E fuor dun cerchio e segnato vno ponto e da quello ala circonferentia piu simeuno: quella che passera per lo centro sira piu longa: E quanto piu passeranno a presso al centro tanto sonno magiori. de laltre che meno sapresseranno al centro. E di quelle linee defuori che sianno menate infino ala circonferentia: quella che va diritto al diametro sia minore dal altre menate da quella si scostano sianno uguali. Lomme sia segnato il ponto. a. fuor del cerchio. k. b. Dal qual ponto simeuno laline. a. k. b. che passi sopra il diametro. k. n. b. E menise laline. a. b. c. e. a. g. d. e. a. f. Dico che laline. a. k. b. (perche passa pel diametro) e magiore di ciascuna delaltre. E laline. a. b. c. (perche piu sapressa al diametro) e magiore di ciascuna delaltre. E ancora dico che laline. a. k. perche si posa insul ponto dela circonferentia doue si posa il diametro. k. b. e minore di ciascuna delaltre linee cioe. a. b. e. a. g. e. a. f. E che. a. b. e. minore del. a. g. perche piu sapressa a quel ponto. E che. a. g. e. minore del. a. f. perche piu sapressa al detto ponto. E perche. k. b. e. k. l. sonno uguali dico che. a. l. e. a. b. sonno uguali. E questo chiaro appare per la figura presente. che dal vulgo e chiamata coda de pavone.

S E da vn ponto dentro adalcun cerchio si puo menare piu di. 2. linee infino ala circonferentia che sianno uguali: quel ponto certamente e centro di quel cerchio. Lomme sia dato vn ponto nel cerchio. b. c. d. ilquale sia il ponto. a. E da quel ponto. a. infino ala circonferentia simeuno. 3. linee uguali cioe. a. d. a. b. a. c. Dico il ponto a. essere centro di quel cerchio. E questo chiaro appare p la presente figura.

S E vno cerchio sega ynaltro cerchio solamente lo segbera in. 2. luoghi: cioe in. 2. poti: Lomme sia il cerchio. a. b. d. ch sega il cerchio. a. b. c. Dico solamente lo segbera in. 2. luoghi cioe. i. 2. poti. a. e. b. E qsto chiaro appare p la figura ch e d q posta.

R E vno cerchio e contingente a vno cerchio: e dacentri di quelli. 2. cerchij sineni vna linea retta: cioe da luno centro a laltro: la detta linea passera certamente p lo punto del contato. Cioe doue ecerchij detti stoccano. Comme sieno. 2. cerchij contingenti. e d. e. e. De quali il punto del contato e il punto. c. Dico che menando vna linea dal centro. a. al centro. b. quella linea passa per lo punto del contato. cioe sopra il punto. c. E quando ecerchij si toccassino dentro. Allora mena lalineia da luno centro a laltro infinitamente qlla passera sopra il pto. c. come chiaro appare p lapite figura. 12

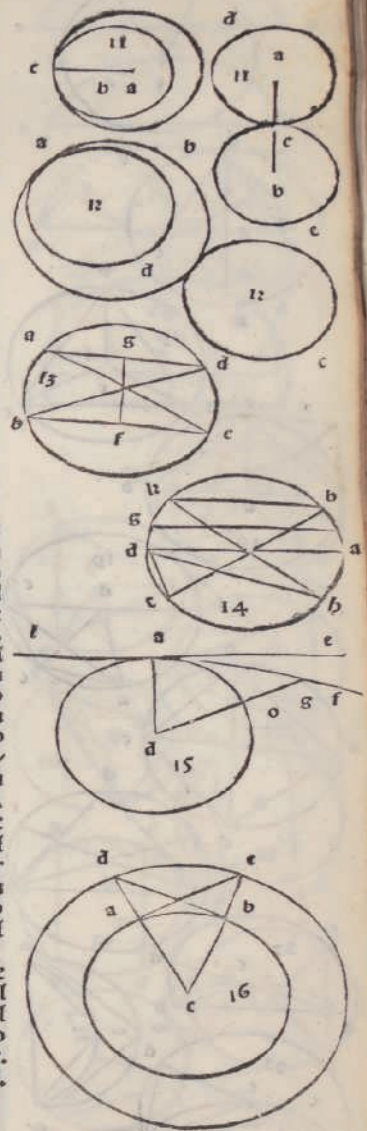
S E vno cerchio tocca vn cerchio dentro o ver difuori: solamente lo toccherà in vn luogo. Comme sia ilcerchio. a. b. contingente ilcerchio. a. d. Dico solamente nel punto. a. lo toccherà. E questo anchora e assai chiaro. e pero non bisogna altra dimostratione.

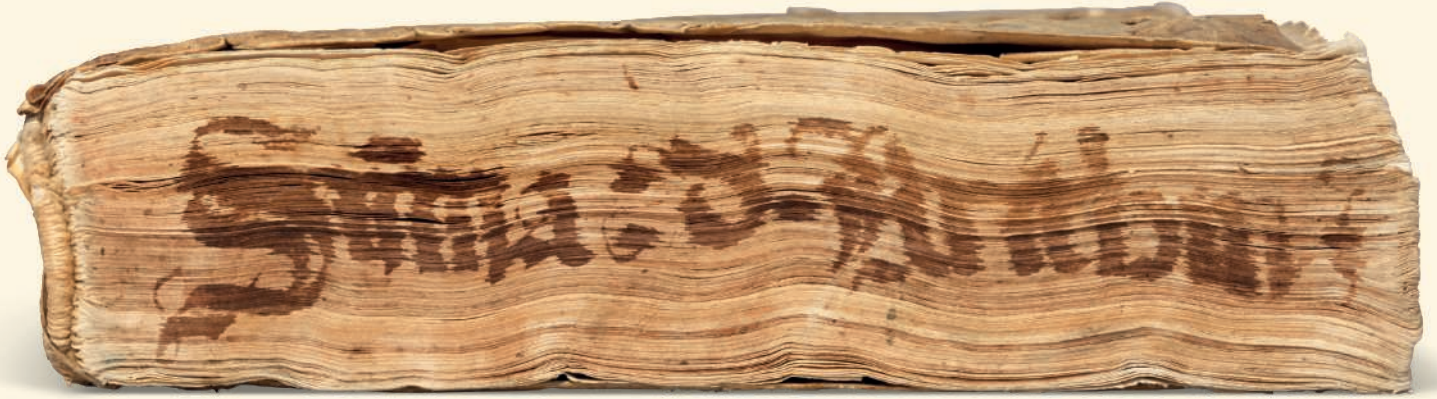
L E linee rette che sonno in vno cerchio: quando elle sonno iguali elle sediscosto no igualmente dal centro. Comme sia nel cerchio. a. d. b. c. Del quale ilcentro sia e. E sieno. 2. linee. a. d. e. b. c. iguali. Dico che le discostano igualmente dalcentro del detto cerchio: cioe dal centro. e. che in questo modo si proua. Adense laperpendicolare dal punto. e. a ciascuna linea sieno le dette perpendiculi. e. f. e. g. Lequali diuidino leditte linee in due parti iguali per la. 3. di questa. Doue langolo. a. g. e. iguale a langolo. e. f. a. Impero che ciascuno e retto. E. g. e. iguali al. f. a. E. e. a. e. iguali al. c. e. Perche ciascuna e mezzo diametro. Onde seguita per la. 46. del primo. e. g. essere iguali al. e. f. chera b. s. o. mostrare.

S E in vno cerchio dato: vi sonno piu linee rette. el diametro e maggiore dalcuna daltre. E quanto al diametro sapressano: tanto sonno maggiori. Comme sia nel cerchio. a. d. l. dare ledite. g. f. b. c. h. k. Dico el diametro. a. d. essere maggiore de ciascuna de laltre. E lalineia. f. g. perche e piu presso al diametro. a. d. che non e. b. h. e maggiore di quella. E questo chiaro appare.

S E dal termine dalcuno diametro si mena vna linea ortogonalmente fatta. Dico che lacade difuori del cerchio. E infra quella e ilcerchio non puo capire altra linea. E langolo fatto da quella e dala circonferentia e minore di tutti gli angoli acuti. E langolo dentro fatto dal diametro e la circonferentia e maggiore di tutti gli angoli acuti. Onde per questo si manifesta tutte ledite rette. cioe sempre quella linea retta dal termine dalcuno diametro ortogonalmente menata. Sara al cerchio contingente. Comme sia ilcerchio. a. b. c. Del qual sia il diametro. a. c. voglio sopra il punto. a. che e termine di detto diametro menare vna linea ortogonalmente fatta che sia. a. e. Dico che infra la circonferentia e ladetta linea: altra linea retta non puo cadere. Impero ch se lacade: o vero fara ortogonalmente sopra il punto. a. o no. Se e ortogonalmente fatta e impossibile che da vn punto medesimo. 2. linee da vna parte menate facino. 2. angoli retti. Impero che luno coterrebbe laltro: e farebbono gli angoli retti infra loro non iguali: che e contra la peticione de Euclide. E se non facesse quella linea angol retto sopra il pto. a. laquale sia lalineia a. f. menate dal centro. d. laperpendicularare sopra. a. f. sia. d. g. sia adunque. d. g. minore del. d. a. E per la. 46. del primo. a. d. puo quanto. d. g. e. g. a. E questo e impossibile. Impero che. d. a. e. d. o. sonno iguali e. d. g. e maggiore del. d. o. E pero infra la detta linea e la circonferentia altra linea non puo entrare. E euidentemente appare che langolo fatto da quella e dala circonferentia e minore di tutti gli angoli acuti di. 2. linee rette. E similmente langolo fatto da la circonferentia: e dal diametro cioe dentro: di tutti gli angoli acuti di. 2. linee rette e maggiore. E anchora e assai chiaro che ogni linea retta dal termine del diametro menata ortogonalmente. e contingente al detto cerchio: E pero non bisogna piu dimostrationi.

D Al dato punto al dato cerchio voglio menare vna linea contingente. Comme sia il dato punto. d. e il dato cerchio sia. a. b. Del quale ilcentro sia. c. Voglio dal punto. d. menare vna linea contingente al cerchio. a. b. Produrro. d. c. segante il cerchio. a. b. nella circonferentia nel punto. a. E sopra ilcentro. c. rigberò ilcerchio secondo laquantita del. d. c. E dal punto. c. menerò laperpendicularare. e. a. sopra lalineia. d. c. E dipoi menerò lalineia. c. e. segante ilcerchio. a. b. nel punto. b. dal qual. b. menerò lalineia. b. d. Laqual dico che contingente al circolo. a. b. che chiaro appare.





1

PACIOLI, Luca (Lucas de Burgo S. Sepulchri; c.1445-1517). *Somma di arithmetica, geometria, proporzioni e proporzionalità*. Venice: Paganinus de Paganinis, 10-20 November 1494.

First edition of Luca Pacioli's *Somma di arithmetica*, a book which has profoundly shaped our modern economic world. This copy in strictly original condition.

- ◆ The most important mathematical book of the Renaissance, of direct influence on Leonardo da Vinci
- ◆ The birth of modern business: being the first published description and enthusiastic endorsement of double-entry bookkeeping, the Venetian mercantile practice which still underpins global trade
- ◆ A milestone in technology and computing, containing the first appearances in print of:
 - ~ mathematical statements using symbols for plus and minus
 - ~ the name and many of the ideas of Fibonacci, the 13th-century mathematician who introduced Hindu-Arabic numerals to Europe
- ◆ The first popular mathematical book: published in the vernacular and intended for use by the professional classes
- ◆ Very rare on the market: the present copy is the only one in its original binding, and one of only three complete copies, recorded at auction in over fifty years

\$1,000,000-1,500,000



Portrait of Luca Pacioli attributed to Jacopo de' Barbari, c. 1495-1500, Capodimonte Museum, Naples. Scala/Ministero per i Beni e le Attività culturali / Art Resource, NY.

LEONARDO'S MATHEMATICIAN

Luca Pacioli's life and career perfectly positioned him as the creator of the Renaissance's most important mathematics book: he was a teacher, traveler, scholar, and—most importantly—a friend and collaborator of the most respected artistic and scholarly luminaries of the period. Born in Sansepolcro around 1445, Pacioli came of age within the sphere of influence of Florence's humanism. He was raised by a local merchant family, where he would have been trained in basic trade arithmetic. Sansepolcro was also the birthplace and home of the great painter and mathematician Piero della Francesca. Piero mentored Pacioli, depicting his young friend in two paintings; in turn, the *Somma* includes Piero's uncredited work on perspective and other topics—a fact which Vasari censures in his *Lives of the Artists*.

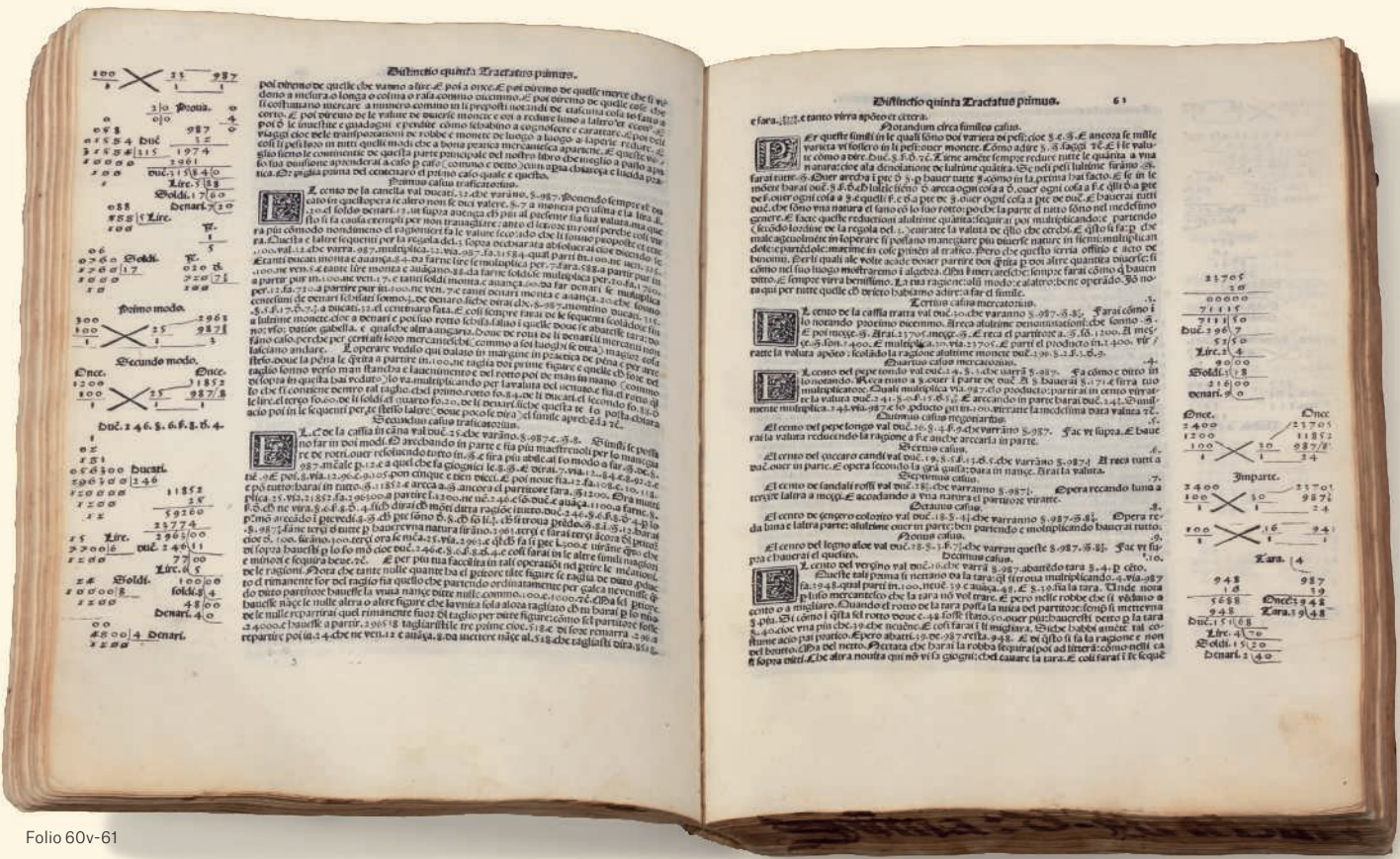
While still a youth, Pacioli traveled to Venice to tutor the sons of a local merchant in *abbaco*: the day-to-day mathematics used by the city's businessmen and traders. This may have been where he first encountered double-entry bookkeeping. His next stop was Rome, where he became a friend and confidant of the great humanist polymath Leon Battista Alberti. Alberti was at the time a Papal secretary and connected Pacioli to the Catholic hierarchy in that city. The young math tutor began to study theology, eventually becoming a Franciscan friar. Alberti must have been a powerful mentor to the young Pacioli—an accomplished Renaissance thinker, but also, like Pacioli, not of high birth. While Alberti's achievements were across diverse fields, from architecture to cryptography, it was mathematics that was central to how he understood the world—a view he clearly transmitted to Pacioli. In the dedication of the *Somma*, he writes that "nothing in creation will be found constituted but as number, weight, and measure." After Alberti's death in 1472, Pacioli left Rome to begin a career as a teacher, lecturing at universities in Perugia, Pisa, and Bologna.

*Nothing in creation will be found constituted but as
number, weight, and measure*

—Luca Pacioli



Intarsia studiolo from the Palace of Duke Federico da Montefeltro in Gubbio, designed by Francesco di Giorgio Martini; a similar room was also created for the Duke's palace at Urbino, where Pacioli made use of his famous library to complete the *Somma*. The *Somma* is dedicated to Federico's son Guidobaldo, whom Pacioli tutored before he became Duke upon his father's death in 1482. Metropolitan Museum of Art, New York.



Folio 60v-61

In the 1490s, Pacioli returned to the town of his birth. He spent his time finishing his long-awaited book: a treatise containing all the math there was to know. His style and scope were informed by a didactic method honed from decades of teaching young boys, his direct observation of merchant practices, and his intimacy with some of the most brilliant minds (and important manuscripts) of his age. That book was the *Somma*, completed under the patronage of Guidobaldo da Montefeltro, Duke of Urbino, whose excellent library was an important resource and to whom the book is dedicated. Its publication earned Pacioli fame—and also the attention of another luminary of the Italian Renaissance: Leonardo da Vinci.

Two years after his publication, Pacioli was invited to the court of Ludovico Sforza in Milan, where Leonardo was working as an engineer. The two men became fast friends, living together and working on unraveling the further secrets of both linear perspective and divine geometry—the fruits of which can be seen in Leonardo's paintings from the period, including the *Last Supper*, and the book they worked on together: *Divina proportione*, printed in 1509. Leonardo had been teaching himself techniques from Pacioli's *Somma*—an education which continued during their intimacy in Milan. A to-do list in Leonardo's Codex Atlanticus reads: "Learn the multiplication of roots from Maestro Luca" (331r), and both the Madrid and Forster codices contain notes on the *Somma*—in particular, sections on proportions and proportionality, including a mirror-version of the *arbor proportionis et proportionalitatis* on folio 82r of Pacioli's work.

The famous portrait of Pacioli by Jacopo de' Barbari, painted in the wake of the acclaim earned from the *Somma*, was once thought to be by Leonardo. It portrays Luca Pacioli as a master of all the realms of mathematics—the Platonic mysteries of geometry alongside the everyday calculations of arithmetic, and both as a teacher (the figure in the background may be Guidobaldo or a nameless student) and a writer. His ability to unite all of these realms and communicate them to the public has earned him a place as a founding father of modern mathematics and technology.



Distinccio.nona.Tractatus.xi^o. particularis de cōputis 7 scripturis.

De quelle cose che sōno necessarie al uero mercatante: e de lordine a sape bē tenere vn q̄/
derno cō suo giornale i vinegia e anche p ognaltro luogo.

Capitolo primo.



Y reuerenti subditi de. U. D. S. Magnanimo. D. acio a pieno
de tutto lordine mercantefco habino el bisogno: deiderai. (olt:
le cose dinanze i q̄sta n̄ra opa ditte) ancora particular tractato
grandemēte necessario cōpillare. E in q̄sto solo lo iserto: p che
a ogni loro occurrēca el p̄sente libro li possa seruire. Si del mo /
do a conti e scripture: cōmo de ragioni. E per esso intendo dar /
li nozma sufficiente e bastante in tenere ordinatamente tutti lor
conti e libri. Pero che. (cōmo si s̄a) tre cose maxime sōno opoz /
tune: a chi uole con debita diligētia mercantare. De le q̄li la poris /
sima e la pecunia numerata e ogni altra faculta substantial. Ju /
xta illud p̄hy vnū aliquid necessariozū ē substantialia. Sēca el cui
suffragio mal si po el manegio traficante exercitare. Auēga che

molti già nudī cō bona fede cōmençando: de grā facēde habio fatto. E mediante lo credito
fedelmēte seruato i magne riccheçe siēno peruenuti. Che asai p ytalìa discurredo nabiamo
cognosciuti. E piu già nele grā republiche non si poteua dire: che la fede del bon mercatan

Folio 198v

A FOUNDATIONAL TEXT OF CAPITALISM

Pacioli, who began his career as an abbaco teacher and private tutor, was intimately familiar with the practical world of accounting, ledger books, and economic arithmetic. His *Somma di arithmetica* not only brought these ideas into print—some for the very first time—but elevated the concerns of the businessman and the practical accountant to the intellectual level of the rest of the humanist curriculum, presented as part of the sum of mathematical learning and an essential part of human knowledge. He confirms the study of economics as a liberal art.

Although double-entry bookkeeping had been known in Italy since at least the 13th century, Pacioli provides its first description in print in any language in book 9 of the *Somma*, entitled *Particularis de computis et scripturis* ("Details of Accounting and Recording"). In addition to eschewing the Latin of the scholastics in favor of the Italian of the merchants, Pacioli provides a remarkably clear and concise guide to succeeding in business. In outlining how to maintain account books, he gives examples and templates with easy-to-remember adages and even quotations from Dante.

Begin with the assumption that a businessman has a goal when he goes into business. That goal he pursues enthusiastically. That goal, and the goal of every businessman who intends to be successful, is to make a lawful and reasonable profit.

—Luca Pacioli



Table with columns for numbers and results, including 'per venia' and 'de canis solis'.

De vna bus numeris in ordine multiplicandi notabilissima articulus. 17. Et dicit eum si mosit de multiplicare separatum e ande locone delo libro...

vostra modo dicto o de i. o ne 2. o de 3. et verbi gratia Noniano che vi voglia che venga la figure dei la forma tutti. 1. dico che pceda voi tutti cotinua qua in che repone...

Table with columns for numbers and results, including 'Duplice via ordinis finitur'.

Folio 30v-31

The description of the "Venetian Method," comprising book 9 of the Somma di arithmetica, is emblematic of a sea-change that had been developing in the status of mercantile theory and practice in Italy, where a middle class who worked for wages was growing in the cities. For several centuries loans had been forbidden as usury and merchants were generally looked down upon as exploiting the rich and the poor alike. But in the great trading centers of Italy, a new form of "business ethics" was being developed. Scholastic writers like San Bernardino of Siena and Antoninus Florentinus began to articulate a moral philosophy which made room for the practice of ethical trade and banking, for which the monetary landscape of the 15th century was increasingly calling.

The accuracy of account-keeping was a major tenet of these new systems of ethics. As economic historian Jacob Soll notes, "businessmen maintained republics," and the integrity of account books was vital to the integrity of the businessman (and the state). While the proto-economic theorists of the scholastic universities had begun to address the morality of business, they did not pursue practical questions of how this might be achieved. Pacioli's work is a major advance in reconciling business with ethics, providing a clear guide to virtuous, as well as effective, accounting and pursuit of profit.

Distinctio nona. Tractatus. xi. De scripturis

Casi che acade mettere ale recordanze del mercante.



Tutte le masseritie di casa o di bottega che tu ti truoui. Ma vogliono essere per ordine. cioè tutte le cose di ferro da perse con spatio da potere agiongner se bisognasse. E così da segnare in margine quelle che fussino perdute o vendute o donate o guaste. Ma non si intende masseritie minute di poco valore. E fare ricordo di tutte le cose dottono da perse comme e detto. E simile tutte le cose di stagno. E simile tutte le cose di lengno. E così tutte le cose di rame. E così tutte le cose di ariento e d'oro e d'argento. E sempre con spatio di qualche carta da potere arrogere se bisognasse. e così da dare notizia di quello che mancasse. Tutte le mercantie o obblighi o promesse che prometteffi per qualche amico. e chiarire bene che e come. Tutte le mercantie o altre cose che ti fosseno lasciate i guardia o a serbo o i pstanta da qualche amico. e così tutte le cose che tu pstanti a altri tuoi amici. Tutti i mercanti conditionati cioè come per esempio contratto cioè che tu mi mandi con le prossime galee che torneranno di ghilerra tanti cantara di lane di lini stri a caso che le sieno buone e recipienti. Io ti daro tanto del cantaro o del cento o veramente ti mandaro al incontro tanti cantara di cottoni. Tutte le case o possessioni o botteghe o gioie che tu affitassi a tanti ducati. o a tante lire l'anno. E quando tu riscoterai il fitto allora gli lodinari fanno a mettere al libro come di sopra ti dissi. Prestando qualche gioia o uasella di ariento o d'oro a qualche tuo amico per otto o quindici giorni di queste cose non si mettono al libro. ma sene fa ricordo ale recordanze. perche fra pochi giorni lai haria uere. E così per contra se a te fossi prestato simili cose non li debbi mettere al libro. Ma farne memoria ale recordanze perche presto lai a rendere.

Comme si scriuono lire e soldi e danari e piccioli e altre abzeuiature.

Lire soldi danari piccioli libbre once danar pesi grani carati ducati fiorin larghi.
 8 s 12 d 100 libbre 16 on 12 d 100 gr 12 duc. fio. largh.

Come si debbe dettare le pite de debitori.

MDCCC. LXXXIII.

Lodouico di piero forestai
 de dare a di. xiiii. nouembre.
 1493. 8. 44. f. 1. d. 8. porto
 contati in pstanta. posto cas
 sa auere. a car. 2 8 44 f 1 d 8.
 E a di. 8. detto 8. 18. f. 11. d.
 6. prometteмо p lui a marti
 no di piero foraboschi a suo
 piacef posto here i qsto. a c. 2. 8 18 f 11 d 6.

Cassa i mano di simone da
 lessio bobeni de dar a di. 14.
 nouembre 1493. 8. 62. f. 13.
 d. 2. da francesco dantonio
 caualcanti in qsto a c. 2 8 62 f 13 d 6.

Martino di piero fora bo
 schi de dare a di. 20. nouem
 bre. 1493. 8. 18. f. 11. d. 6. por
 to luimedesimo contati po
 sto cassa a car. 2. 8 18 f 11 d 6.

Francesco dantonio caual
 canti de dare a di. 12. di noue
 bre. 1493. 8. 20. f. 4. d. 2. ci p
 misse a nostro piacef p lodo
 uico di piero forestai a c. 2. 8 20 f 4 d 2.

Come si debbe dittare le pite di creditori.

MDCCC. LXXXIII.

Lodouico di piero forestai
 de hauere a di. 22. nouembre
 1493. 8. 20. f. 4. d. 2. sono p
 parte di pagamento. E per
 lui celta promissi a nostro
 piacere francesco dantonio.
 caualcanti posto dare a c. 2. 8 20 f 4 d 2.

Cassa in mano di simone
 dalessio bobeni de hauere a
 di. 14. nouembre. 1493. 8. 44.
 f. 1. d. 8. alo douico di piero
 forestani in qsto. a car. 2. 8 44 f 1 d 8.
 E a di. 22. nouembre. 1493
 8. 18. f. 11. d. 6. a martino di
 piero foraboschi. a c. 2. 8 18 f 11 d 6.

Martino di piero fora bo
 schi de hauere a di. 18. noue
 bre. 1493. 8. 18. f. 11. d. 6. gli
 prometteмо a suo piacere p
 lodouico di piero forestani
 posto obbi here i qsto a c. 2. 8 18 f 11 d 6

Francesco dantonio caual
 canti de hauere a di. 14. no
 uembre. 1493. 8. 62. f. 13. d. 6.
 reco lui medesimo pstanti po
 sto cassa dare a car. 2. 8 62 f 13 d 6.

HOW TO SUCCEED IN BUSINESS

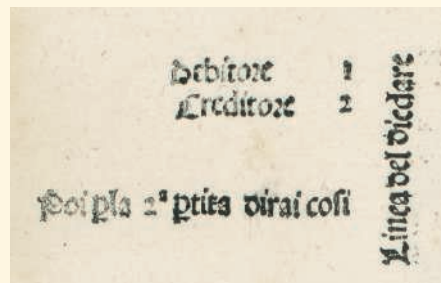
For the mathematical Pacioli, the well-kept account book maintains and preserves the health of the state. He writes that there are three necessities for a successful business:

- ◆ Cash or credit
- ◆ A good accountant
- ◆ Good internal control [“bello ordine”]


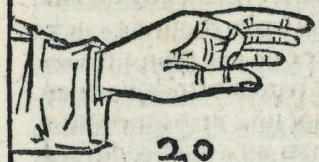
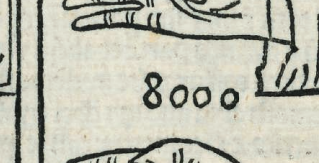


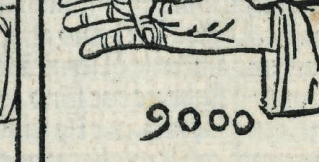
The accountant—who must be well-versed in mathematics—is responsible for the internal control of the books. If followed, Pacioli’s system allows for a businessman to “pursue profit lawfully” and achieve good results. He also notes that “without double entry, businessmen would not sleep easily at night. Their minds would keep them awake with worry about their business. To prevent this stress, I wrote book 9 of the *Somma*” (trans. Cripps).

Pacioli details not only the mathematics of accounting, but the practical issues of how many and what kinds of ledgers to use, so that a business owner can understand exactly what they have and what they need to succeed. He writes: “begin with the assumption that a businessman has a goal when he goes into business. That goal he pursues enthusiastically. That goal, and the goal of every businessman who intends to be successful, is to make a lawful and reasonable profit.” The *Somma* emphasizes practices which are still basic to accounting: the importance of understanding inventory maintenance, cash versus capital, and using a uniform currency to keep accounts. Pacioli is also credited as the first author to describe the “rule of 72”—a method of calculating compound interest which continues to be part of the accounting curriculum today.

This view of business—underwritten by double-entry bookkeeping—was so successful that it has established itself in the language of vice and virtue writ large. While the Good Book may be scripture, God’s book is surely a ledger. During the Reformation, we begin to see the adoption of bookkeeping metaphors into the language of Heaven and Hell, where Heavenly credits and debits are weighed against each other in a final reckoning. David Wootton writes that “The account book was thus something more than a metaphor: it was an organizing principle through which all human behavior could be interpreted. And that principle was one of endless pursuit, of insatiable acquisition, of limitless aspiration. Double-entry bookkeeping comes, we may say, to substitute itself for virtue.”



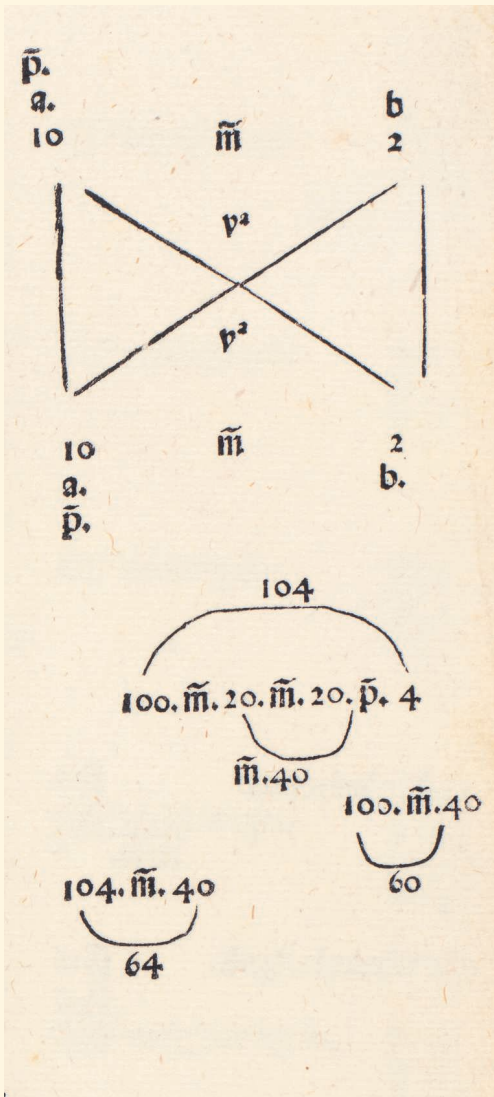
Folio 201v

1	10	100	1000
			
2	20	200	2000
			
3	30	300	3000
			
4	40	400	4000
			
5	50	500	5000
			
6	60	600	6000
			
7	70	700	7000
			
8	80	800	8000
			
9	90	900	9000
			

RENAISSANCE DIGITAL COMPUTING

The *Somma di arithmetica* is often regarded as the first printed book on algebra, making it an early milestone in the history of the technologies that most powerfully shape our lives today: computing and programming. While the word *computus* in the Middle Ages largely referred to the computations required to understand and calculate the church calendar, the concepts of computing and calculation were important to many aspects of Renaissance life. As Arielle Saiber writes, “there were computers in Renaissance Italy. Excellent and varied computers: they were the people who calculated quantities, formulated algorithms, proposed new mathematical objects and equations, tested proofs.” Techniques for number crunching were vital not only to accountants and clerics determining the date of Easter, but to a variety of other professions and pursuits—including architects, artists, and astronomers. Efforts to find ways to solve complex equations quickly were what would eventually lead to the development of Charles Babbage’s analytical engine and then the modern computer. Some of these ideas find their origin in the manuscript works of Fibonacci, whom Pacioli cites as a source for much of the contents of the *Somma*—as discussed by Keith Devlin in the foreword to this catalogue.

While famous in our time for his eponymous sequence and the “golden ratio,” in the 13th century Fibonacci was known for his arithmetic textbook, the *Liber abbaci*, which circulated in manuscript form for several centuries. The son of a trader who spent time in Muslim North Africa, he studied arithmetic in Algeria where he encountered Hindu-Arabic numerals and the work of the Persian mathematician al-Khwārizmī (from whose name our word “algorithm” is derived). The *Liber abbaci* became the basis of the curriculum of Italy’s abbaco schools, which gained momentum in Northern Italy as a way to train children in the practical business applications of math. Hindu-Arabic numerals are a place-value number system, meaning that the value of each digit depends on its place within the larger number. To the user of an abacus or counting board, this system based on positions within columns would have come very naturally.



Folio 113

Pacioli's *Somma* is the first printed work to illustrate the finger symbolism of numbers—a relationship between our bodies and the number system which dates back to the development of the base-10 system and the word “digitus” itself, which means both finger and number (hence our current “digital age”). It is also the first place in print where plus and minus appear as symbols, alongside the root sign.

Whereas up until then, mathematical questions were usually expressed as word problems as a matter of course, Pacioli's book enshrined in print the possibility of a symbolic representation of equations. His use of \bar{p} and \bar{m} to represent “piu” (plus) and “meno” (minus) would eventually morph into the symbols that we use today, with “+” deriving ultimately from the ampersand and “-” from the \bar{m} . This was the first step in a long process of mathematical development that was continued by the next generation of Pacioli's readers. The emergence of symbolic algebra in the following century was the beginning of the expression of mathematics in a purely symbolic language—specifically, the coding and the expression of algorithms which eventually could be read by the modern computer.

The *Somma* was a major influence on Niccolò Tartaglia, who was the first to solve cubic equations—a task which Pacioli discusses the difficulty of in the *Somma*. Girolamo Cardano published Tartaglia's solution in his own *Ars Magna*, a work on algebra which uses variants of Pacioli's symbols and is one of the mathematical masterpieces of that century. The search for a purely symbolic language was driven not only by practical concerns but also by philosophical and religious desires to uncover a “perfect” language—ideas which would eventually come together in the work of Gottfried Leibniz and the creation of calculus and symbolic logic.

De vi ⁊ necessitate istorum terminorum: videlicet. Plus ⁊ Minus. Distinctio octava. Tractatus primus. ar. prim⁹.

Piu e meno illoz modo operatio

Folio 111v

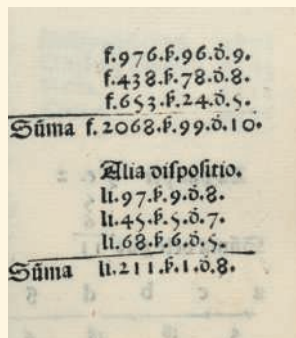
ALL THE MATH THAT'S FIT TO PRINT

The breadth of the applications of Pacioli's work are borne out in the trajectories of his students and colleagues. He was the teacher of Domenico Novara da Ferrara, who would go on to teach Copernicus—whose mathematical astronomy proved the heliocentric model. Evidence also suggests that Pacioli likely met and taught perspective to the artist Albrecht Dürer in the early 1500s. While the *Somma* represents the pinnacle of mathematical knowledge in the Renaissance, it also provided a firm foundation for the mathematics that would come—providing training and guidance not only for future generations of mathematicians, astronomers, and artists but also businessmen, merchants, and economists.

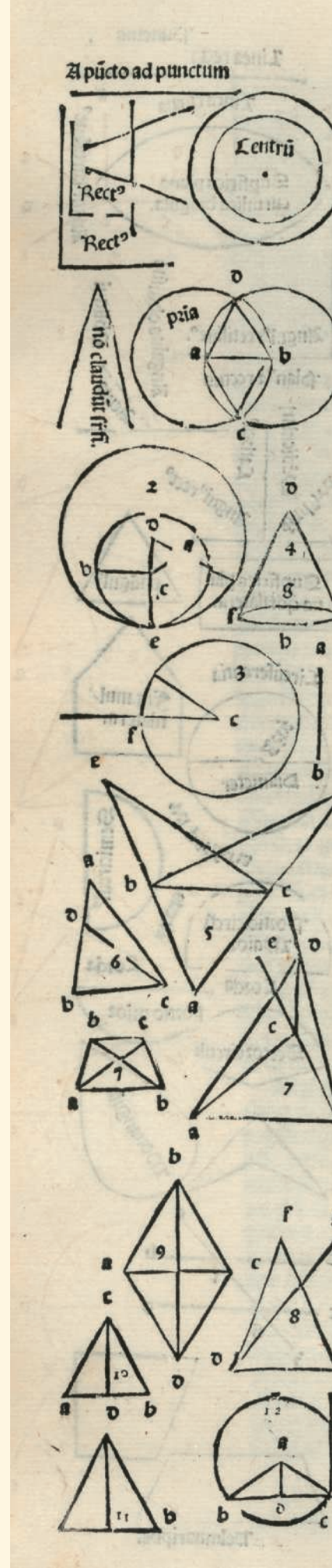
But while Pacioli taught many illustrious students, it is this printed book that has allowed his influence to truly take hold. Although he composed the *Somma* in his hometown, Pacioli brought the finished manuscript to be printed in Venice—at that time, the center of the publishing world. It was also a center of scientific publishing: a decade earlier, Ratdolt's Venetian *editio princeps* of Euclid was the first book with technical diagrams printed alongside the text.

The publisher whom Pacioli chose, and would continue to work with throughout his career, was Paganino Paganini. Paganini had entered the world of printing by marrying the daughter of the German printer Franz Renner. *Somma di arithmetica* was one of the first major products of the press, executed with the help of Paganino's typecutter virtuoso son Alessandro—who would later go on to print the first Arabic Qur'an.

Pacioli's *Somma* was a large and serious undertaking, which took about a year to print in its entirety. It was sold for 119 soldi—about a week's wages for a scholar. It was clearly intended as an investment for savvy merchants and businessmen, who would make a return through its use. Olschki writes that it was the most widely used mathematical text in Italy for 50 years after its publication, and Pacioli applied for a 20-year copyright extension in 1508. This is a testament to the importance and influence of Pacioli's work, which informed generations of merchants on the basic tenets of bookkeeping, fast calculation, and arithmetic. Ingrid Rowland writes that it "may be the most elegant and compendious of all vernacular manuals." Neither a simple primer nor a tome for the learned, the *Somma* was a serious work made to meet the demand of the burgeoning classes of businessmen, artists, artisans, and merchants in Renaissance Italy.



Folio 23



Folio 1v



Folio 52v-53

PHYSICAL DESCRIPTION

This copy, uncut in its unlined vellum wrapper, is the only one in original condition recorded at auction in over fifty years. A large and beautiful work prized for its usefulness, Pacioli's *Somma di arithmetica* has had a place for centuries in the world's ancient institutional libraries but has been rare on the market in the last century. Our copy, which was previously in a Piedmontese noble library, is in superlative condition but has not gone unused throughout its long life. Indeed, it bears evidence of having been in the hands of those engaged with the worlds of mathematics, science and business. A contemporary owner has written on the flyleaf a mnemonic device for a math-based divination game—one very similar to the games discussed in Pacioli's manuscript work *De viribus quantitatis* ("On the Powers of Numbers"). Seventeenth-century marginalia record both astronomical calculations and several receipts for rented rooms.

Super-chancery folio (317 x 220mm). 308 leaves. Collation: π^8 a-z⁸ <et>⁸ >⁸ <orum>¹⁰ AA¹⁴ A-H⁸ I-K⁶ (π 1r title and contents; π 1v author's address to Marco Sanuto, epigrams by Fa Pompilius and Giorgio Sommariva, quire register, colophon; π 2r dedicatory letters to Guidobaldo da Montefeltro; π 4v summaries of part one; π 4v table of contents of part one; a1r preface, text of part one; AA14v second colophon; A1r text of part 2 (Geometria); K5r-6r table and register of Geometria; K6v blank). 56 lines and headline. Types: 9/12:130G, 10:92Ga, 8:84G, 13:68Gb, 16:87G. Dedication and incipits on a1r printed in red. Many woodcut diagrams, one full-page diagram printed in red and black; woodcut initials from several sets, including one (repeated) historiated initial L depicting Pacioli and the *Somma*.

This copy, uncut in its unlined vellum wrapper, is the only copy in original condition recorded at auction in over fifty years

Issues

Typographic evidence shows the continued demand for the *Somma* in the decade and more following its publication in 1494. A deficiency in stock—perhaps due to an original miscalculation of required copies or merely a mishap at the printer—necessitated a small number of sheets to be re-set in type and printed again, not once, but twice. These sheets (a-c, d1, 2, e1, A1) indicate three issues of the first edition were available for sale to contemporary purchasers over a short period. The present copy conforms to the second issue, with these reprinted sheets set with type material which may date to c.1502. A third setting of these sheets is dated c.1507-1509. Clarke interprets this as evidence of an important book selling very well on first publication, followed by renewed demand justifying reissues until the stocks are finally exhausted. D.A. Clarke, "The first edition of Pacioli's 'Summa de Arithmetica' (Venice, Paganinus de Paganinis, 1494)," *Gutenberg-Jahrbuch* (1974), pp. 90-92.

Condition

An extremely fine copy, in strictly original condition. The survival of this volume in this condition is remarkable, especially given that it retains its original, unlined vellum wrapper binding. The binding is its first, thereby preserving nearly the entire original sheet size with numerous deckle edges, and there have been no interventions, aside from two minor marginal paper repairs; the type impressions remain fresh. We know of no finer copy. Over the past five centuries the volume has acquired some minor signs of wear; a detailed condition report is available upon request.

Binding

Contemporary Italian unlined vellum wrapper with BAL written on front cover, sewn on white leather thongs, missing two fore-edge ties, title lettered along lower edges in a contemporary hand, a pair of original flyleaves at front (flyleaves defective, later paper spine label, minor staining, minor wear at edge of lower cover, minor wear around thongs at spine).

Provenance

"BAL" (initials lettered on front cover in an early hand) – "Aperi Premati Magister Flamine Peia Bispane Bispena" (contemporary mnemonic device for an arithmetic-based divination game written on front flyleaf) – astronomical calculations and rental annotations dated 1648-56 written on title-page; occasional annotations elsewhere – repeated illegible hand-stamped roundels on front flyleaf – A noble Piedmontese library (sold: Bolaffi, 16 December 2014, lot 637).

Bibliographical References

BMC V 457; Bod-inc L-167; BSB-Ink P-2; Essling 779; Goff L-315; Goldsmiths' 5; HC(+Add) 4105; IGI 7134 (re-issue I); ISTC il00315000; Klebs 718.1; Riccardi ii, 226; Sander 5367; Smith, *Rara Arithmetica*, p. 54.

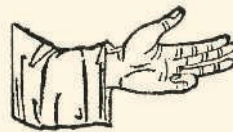
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Fundamentum

SELECT LITERATURE

- Brooks, Richard. *Bean Counters: The Triumph of the Accountants and How They Broke Capitalism*. London: Atlantic Books, 2018.
- Clarke, D.A. "The first edition of Pacioli's 'Summa de Arithmetica' (Venice, Paganinus de Paganinis, 1494)," in *Gutenberg-Jahrbuch* (1974), pp. 90-92.
- Cripps, Jeremy. *Particularis de computis et scripturis, 1494, Luca Pacioli: A Contemporary Interpretation*. Seattle: Pacioli Society, 1994.
- De Roover, Raymond. *San Bernardino of Siena and Sant'Antonino of Florence: The Two Great Economic Thinkers of the Middle Ages*. Boston: Harvard Graduate School of Business Administration, 1967.
- Devlin, Keith. *The Man of Numbers: Fibonacci's Arithmetic Revolution*. London: Bloomsbury, 2011.
- Eco, Umberto. *Serendipities: Language and Lunacy*. New York: Columbia University Press, 1998.
- Gleeson-White, Jane. *Double-Entry: How the Merchants of Venice Created Modern France*. New York: W.W. Norton & Company, 2011.
- Heefer, Albrecht. "The Genesis of the Algebra Textbook: From Pacioli to Euler," in *Almagest* (May 2012), pp. 27-61.
- McCarthy, Patricia with Alan Sangster and Greg Stoner. "Pacioli and Humanism: pitching the text in Summa Arithmetica," in *Accounting History*, vol. 13 (2008), pp. 183-206.
- Olschki, Leo. *Geschichte der Neusprachlichen Wissenschaftlichen Literatur*. Heidelberg: Carl Winter, 1918.
- Rowland, Ingrid. "Abacus and Humanism," in *Renaissance Quarterly*, vol. 48, no. 4, pp. 695-727.
- Saiber, Arielle. *Measured Words: Computation and Writing in Renaissance Italy*. University of Toronto Press, 2018.
- Sangster, Alan. "The Printing of Pacioli's Summa in 1494: How Many Copies were Printed," in *The Accounting Historians Journal*, vol. 32, no. 1 (June 2007), pp. 125-145.
- Soll, Jacob. *The Reckoning: Financial Accountability and the Making and Breaking of Nations*. New York: Basic Books, 2014.
- Wootton, David. *Power, Pleasure, and Profit: Insatiable Appetites from Machiavelli to Madison*. Cambridge: Harvard University Press, 2018.



Ad illustrissimū Principē Sui. Abaldū Urbini Ducē Montis ferentis: ac Du-
rantis Com: rē: Grecis latinisqz litteris Ornatissimuz: & Mathematicē discipline
cultozē feruētissimū: Fratris Luce de Burgo sancti Sepulchri: Ordinis minor:
& sacre Theologie Magistri. In artē arithmetice: & Geometrie. Prefatio.



La quātita Magnanimo duca

e si nobile & eccellente cosa che molti philosophi
 p̄ q̄sto lbano giudicata ala substātia para: e co-
 messa coeterna. Pero che hano cognosciuto p̄
 verū modo alcuna cosa in rez natura senza lei
 nō potere esistere. Per la qual cosa de lei itēdo
 (cō laiuto de colui che li nostri sensi reggi) tra-
 ctarne: nōche p̄ altri prischi e antichi phyloso-
 phi nōne sia copiosamēte tractato: e i theorica
 e pratica. Ma p̄ che lor dicti gia ali tēpi nostri
 sono molto obscuri: e da molti male apresi: e ale
 pratiche vulgari male applicati: diche in loro
 opationi molto variano: e cō grādi elaboriosi af-
 fanni mettano in opa: si de nūeri cōmo de misu-

re: vnde di lei parlādo nō intēdo se nō quāto che ala pratica e opare sia mestiero: me
 scolādoci secōdo iluoghi oportuni ancora la theorica: e causa de tale opare: si de nu-
 meri cōmo de geometria. Ma p̄sa acio meglio q̄llo che sequita se habia ap̄phende-
 re: essa quātita diuideremo secōdo el n̄ro p̄posito: ediuidēdola aciascun suo mēbro
 assegnare suo p̄pria e vera diffinitioe e descriptioe. E aloza poi sequira q̄llo che
 Arist. dici in secūdo poster. Tūc eni maxime scit aliqd cū habet suuz qd est rē.

**Diffinitiones & diuisio discrete & continue quantitatis: articulus primus prime
 distinctionis.**

O Jco adōca. La quātita essere imediate bimembre: cioe cōtinua e discreta.
 La continua e quella lechui parti sonno copulate e gionte a certo termine
 cōmune: cōme sōno legni: ferro: e saxa rē. La discreta oueramēte nūero:
 e quella le cui parti nō sonno giōte adalcuno termine cōe: cōmo e. 1. 2. 3. rē.
 Diche prima dela discreta: cioe del nūero: e poi dela continua cioe geometria: quā-
 to alo intento aspecta chiaramente tractaremo.

Diffinitio numeri propriissima. articulus secundus.

N Amero e (secōdo ciascano phylosophāte) vna multitudine de vnita cōpo-
 sta: et essa vnita nō e numero: ma ben principio de ciascan numero: ede q̄lla
 mediāte laquale ogni cosa e ditte essere vna. E secōdo el seuerin Boetio in
 sua musica: e la vnita ciascū nūero i potētia: & passiz i sua arithmetica. Regi-
 na e fondamēto dogni numero lapella. Laqual piu magnificāda in le cose naturali
 disse in q̄llo che fa de vnitate & vno. Omne qd est: ideo est: qz vnū nūero est. Ene an-
 cora el nūero in infiniti mēbri diuiso: p̄ quel che esso Arist. dixē: cioe. Siqd infinitum
 est: nūerus est. E p̄ la terza petitiōe del septio de Euclide: la sua serie in infinito pote-
 re p̄cedere: et quocūqz nūero dato: dari pōt maior vnitate addēdo. Ma noi piglia-
 remo quelle parti anoi piu note e accomodate. E pero dico cō glialtri alcuno essere
 primo: ede quello che solo dala vnita e nūerato: e nō ha altro nūero: che itegralmē-
 te apōto lo parta. Altro e ditto cōposto: ede q̄llo che da altro nūero e mesurato: oue-
 ro nūerato. Exēplū primi Cōmo. 3. 7. 11. 13. e. 17. rē. Exēplū secūdi. Cōmo. 4. chel
 doi lo mesura e nūera: e. 8. chel. 2. e. 4. El. 12. 14. 18. e simili: tuti sōno ditti nūeri cō-
 posti: nō solo che cōstino ex digito & articulo (secondo sacro busco in suo algorismo)
 ma p̄che itegralmēte paltri nūeri si possano mesurare e ptire: secōdo el sēso de Eucli-
 de in septio anche. 20. 30. 40. che sōno meri articuli: p̄ esso sōno ditti cōpositi. Al-
 cuni sono nūeri cōtra se primi: & sono q̄lli (cōmo e detto) che p̄ sola vnita sono mesu-
 rati e nūerati: cōme sōno. 11. 13. 17. 19. che luno a laltro esaltro a luno e p̄mo: nec
 reliquū p̄ alterū itegraliter diuidi pōt vt pz situēti. De q̄li alcuno po essere cōposto e
 laltro primo e luno laltro pō esser primo: cōmo p̄ la. 24. del. 7° si dimōstra. Exēpluz

CONDITIONS OF SALE • BUYING AT CHRISTIE'S

CONDITIONS OF SALE

These Conditions of Sale and the Important Notices and Explanation of Cataloguing Practice set out the terms on which we offer the **lots** listed in this catalogue for sale. By registering to bid and/or by bidding at auction you agree to these terms, so you should read them carefully before doing so. You will find a glossary at the end explaining the meaning of the words and expressions coloured in **bold**.

Unless we own a **lot** in whole or in part (Δ symbol), Christie's acts as agent for the seller.

A BEFORE THE SALE

1 DESCRIPTION OF LOTS

- (a) Certain words used in the catalogue description have special meanings. You can find details of these on the page headed "Important Notices and Explanation of Cataloguing Practice" which forms part of these terms. You can find a key to the Symbols found next to certain catalogue entries under the section of the catalogue called "Symbols Used in this Catalogue".
- (b) Our description of any **lot** in the catalogue, any **condition** report and any other statement made by us (whether orally or in writing) about any **lot**, including about its nature or **condition**, artist, period, materials, approximate dimensions, or **provenance** are our opinion and not to be relied upon as a statement of fact. We do not carry out in-depth research of the sort carried out by professional historians and scholars. All dimensions and weights are approximate only.

2 OUR RESPONSIBILITY FOR OUR DESCRIPTION OF LOTS

We do not provide any guarantee in relation to the nature of a **lot** apart from our **authenticity warranty** contained in paragraph E2 and to the extent provided in paragraph I below.

3 CONDITION

- (a) The **condition** of **lots** sold in our auctions can vary widely due to factors such as age, previous damage, restoration, repair and wear and tear. Their nature means that they will rarely be in perfect **condition**. **Lots** are sold "as is," in the **condition** they are in at the time of the sale, without any representation or warranty or assumption of liability of any kind as to **condition** by Christie's or by the seller.
- (b) Any reference to **condition** in a catalogue entry or in a **condition** report will not amount to a full description of condition, and images may not show a **lot** clearly. Colours and shades may look different in print or on screen to how they look on physical inspection. **Condition** reports may be available to help you evaluate the **condition** of a **lot**. **Condition** reports are provided free of charge as a convenience to our buyers and are for guidance only. They offer our opinion but they may not refer to all faults, inherent defects, restoration, alteration or adaptation because our staff are not professional restorers or conservators. For that reason **condition** reports are not an alternative to examining a **lot** in person or seeking your own professional advice. It is your responsibility to ensure that you have requested, received and considered any **condition** report.

4 VIEWING LOTS PRE-AUCTION

- (a) If you are planning to bid on a **lot**, you should inspect it personally or through a knowledgeable representative before you make a bid to make sure that you accept the description and its **condition**. We recommend you get your own advice from a restorer or other professional adviser.
- (b) Pre-auction viewings are open to the public free of charge. Our specialists may be available to answer questions at pre-auction viewings or by appointment.

5 ESTIMATES

Estimates are based on the **condition**, rarity, quality and **provenance** of the **lots** and on prices recently paid at auction for similar property. **Estimates** can change. Neither you, nor anyone else, may rely on any **estimates** as a prediction or guarantee of the actual selling price of a **lot** or its value for any other purpose. **Estimates** do not include the **buyer's premium** or any applicable taxes.

6 WITHDRAWAL

Christie's may, at its option, withdraw any **lot** from auction at any time prior to or during the sale of the **lot**. Christie's has no liability to you for any decision to withdraw.

7 JEWELLERY

- (a) Coloured gemstones (such as rubies, sapphires and emeralds) may have been treated to improve their look, through methods such as heating and oiling. These methods are accepted by the international jewellery trade but may make the gemstone less strong and/or require special care over time.
- (b) All types of gemstones may have been improved by some method. You may request a gemmological report for any item which does not have a report if the request is made to us at least three weeks before the date of the auction and you pay the fee for the report.
- (c) We do not obtain a gemmological report for every gemstone sold in our auctions. Where we do get gemmological reports from internationally accepted gemmological laboratories, such reports will be described in the catalogue. Reports from American gemmological laboratories will describe any improvement or treatment to the gemstone. Reports from European gemmological laboratories will describe any improvement or treatment only if we request that they do so, but will confirm when no improvement or treatment has been made. Because of differences in approach and technology, laboratories may not agree whether a particular gemstone has been treated, the amount of treatment, or whether treatment is permanent. The gemmological laboratories will only report on the improvements or treatments known to the laboratories at the date of the report.
- (d) For jewellery sales, **estimates** are based on the information in any gemmological report. If no report is available, assume that the gemstones may have been treated or enhanced.

8 WATCHES & CLOCKS

- (a) Almost all clocks and watches are repaired in their lifetime and may include parts which are not original. We do not give a **warranty** that any individual component part of any watch is **authentic**. Watchbands described as "associated" are not part of the original watch and may not be **authentic**. Clocks may be sold without pendulums, weights or keys.
- (b) As collectors' watches often have very fine and complex mechanisms, you are responsible for any general service, change of battery, or further repair work that may be necessary. We do not give a **warranty** that any watch is in good working order. Certificates are not available unless described in the catalogue.
- (c) Most wristwatches have been opened to find out the type and quality of movement. For that reason, wristwatches with water resistant cases may not be waterproof and we recommend you have them checked by a competent watchmaker before use. Important information about the sale, transport and shipping of watches and watchbands can be found in paragraph H2(f).

B REGISTERING TO BID

1 NEW BIDDERS

- (a) If this is your first time bidding at Christie's or you are a returning bidder who has not bought anything from any of our salerooms within the last two years you must register at least 48 hours before an auction begins to give us enough time to process and approve your registration. We may, at our option, decline to permit you to register as a bidder. You will be asked for the following:
 - (i) for individuals: Photo identification (driver's licence, national identity card, or passport) and, if not shown on the ID document, proof of your current address (for example, a current utility bill or bank statement);
 - (ii) for corporate clients: Your Certificate of Incorporation or equivalent document(s) showing your name and registered address together with documentary proof of directors and beneficial owners; and
 - (iii) for trusts, partnerships, offshore companies and other business structures, please contact us in advance to discuss our requirements.

- (b) We may also ask you to give us a financial reference and/or a deposit as a condition of allowing you to bid. For help, please contact our Credit Department at +1 212-636-2490.

2 RETURNING BIDDERS

As described in paragraph B(1) above, we may at our option ask you for current identification, a financial reference, or a deposit as a condition of allowing you to bid. If you have not bought anything from any of our salerooms within the last two years or if you want to spend more than on previous occasions, please contact our Credit Department at +1 212-636-2490.

3 IF YOU FAIL TO PROVIDE THE RIGHT DOCUMENTS

If in our opinion you do not satisfy our bidder identification and registration procedures including, but not limited to completing any anti-money laundering and/or anti-terrorism financing checks we may require to our satisfaction, we may refuse to register you to bid, and if you make a successful bid, we may cancel the contract for sale between you and the seller.

4 BIDDING ON BEHALF OF ANOTHER PERSON

If you are bidding on behalf of another person, that person will need to complete the registration requirements above before you can bid, and supply a signed letter authorising you to bid for him/her. A bidder accepts personal liability to pay the **purchase price** and all other sums due unless it has been agreed in writing with Christie's, before commencement of the auction, that the bidder is acting as an agent on behalf of a named third party acceptable to Christie's and that Christie's will only seek payment from the named third party.

5 BIDDING IN PERSON

If you wish to bid in the saleroom you must register for a numbered bidding paddle at least 30 minutes before the auction. You may register online at www.christies.com or in person. For help, please contact the Credit Department on +1 212-636-2490.

6 BIDDING SERVICES

The bidding services described below are a free service offered as a convenience to our clients and Christie's is not responsible for any error (human or otherwise), omission, or breakdown in providing these services.

(a) Phone Bids

Your request for this service must be made no later than 24 hours prior to the auction. We will accept bids by telephone for **lots** only if our staff are available to take the bids. If you need to bid in a language other than in English, you must arrange this well before the auction. We may record telephone bids. By bidding on the telephone, you are agreeing to us recording your conversations. You also agree that your telephone bids are governed by these Conditions of Sale.

(b) Internet Bids on Christie's LIVE™

For certain auctions we will accept bids over the Internet. For more information, please visit <https://www.christies.com/buying-services/buying-guide/register-and-bid/>. As well as these Conditions of Sale, internet bids are governed by the Christie's LIVE™ Terms of Use which are available on <https://www.christies.com/LiveBidding/OnlineTermsOfUse>.

(c) Written Bids

You can find a Written Bid Form at the back of our catalogues, at any Christie's office, or by choosing the sale and viewing the **lots** online at www.christies.com. We must receive your completed Written Bid Form at least 24 hours before the auction. Bids must be placed in the currency of the saleroom. The **auctioneer** will take reasonable steps to carry out written bids at the lowest possible price, taking into account the **reserve**. If you make a written bid on a **lot** which does not have a **reserve** and there is no higher bid than yours, we will bid on your behalf at around 50% of the **low estimate** or, if lower, the amount of your bid. If we receive written bids on a **lot** for identical amounts, and at the auction these are the highest bids on the **lot**, we will sell the **lot** to the bidder whose written bid we received first.

C CONDUCTING THE SALE

1 WHO CAN ENTER THE AUCTION

We may, at our option, refuse admission to our premises or decline to permit participation in any auction or to reject any bid.

2 RESERVES

Unless otherwise indicated, all **lots** are subject to a **reserve**. We identify **lots** that are offered without **reserve** with the symbol Δ next to the **lot number**. The **reserve** cannot be more than the **lot's low estimate**.

3 AUCTIONEER'S DISCRETION

The **auctioneer** can at his or her sole option:

- (a) refuse any bid;
- (b) move the bidding backwards or forwards in any way he or she may decide, or change the order of the **lots**;
- (c) withdraw any **lot**;
- (d) divide any **lot** or combine any two or more **lots**;
- (e) reopen or continue the bidding even after the hammer has fallen; and
- (f) in the case of error or dispute related to bidding and whether during or after the auction, continue the bidding, determine the successful bidder, cancel the sale of the **lot**, or reoffer and resell any **lot**. If you believe that the **auctioneer** has accepted the successful bid in error, you must provide a written notice detailing your claim within 3 business days of the date of the auction. The **auctioneer** will consider such claim in good faith. If the **auctioneer**, in the exercise of his or her discretion under this paragraph, decides after the auction is complete, to cancel the sale of a **lot**, or reoffer and resell a **lot**, he or she will notify the successful bidder no later than by the end of the 7th calendar day following the date of the auction. The **auctioneer's** decision in exercise of this discretion is final. This paragraph does not in any way prejudice Christie's ability to cancel the sale of a **lot** under any other applicable provision of these Conditions of Sale, including the rights of cancellation set forth in sections B(3), E(2)(i), F(4), and J(1).

4 BIDDING

The **auctioneer** accepts bids from:

- (a) bidders in the saleroom;
- (b) telephone bidders;
- (c) internet bidders through 'Christie's LIVE™ (as shown above in paragraph B6); and
- (d) written bids (also known as absentee bids or commission bids) left with us by a bidder before the auction.

5 BIDDING ON BEHALF OF THE SELLER

The **auctioneer** may, at his or her sole option, bid on behalf of the seller up to but not including the amount of the **reserve** either by making consecutive bids or by making bids in response to other bidders. The **auctioneer** will not identify these as bids made on behalf of the seller and will not make any bid on behalf of the seller at or above the **reserve**. If **lots** are offered without **reserve**, the **auctioneer** will generally decide to open the bidding at 50% of the **low estimate** for the **lot**. If no bid is made at that level, the **auctioneer** may decide to go backwards at his or her sole option until a bid is made, and then continue up from that amount. In the event that there are no bids on a **lot**, the **auctioneer** may deem such **lot** unsold.

6 BID INCREMENTS

Bidding generally starts below the **low estimate** and increases in steps (bid increments). The **auctioneer** will decide at his or her sole option where the bidding should start and the bid increments. The usual bid increments are shown for guidance only on the Written Bid Form at the back of this catalogue.

7 CURRENCY CONVERTER

The saleroom video screens (and Christie's LIVE™) may show bids in some other major currencies as well as US dollars. Any conversion is for guidance only and we cannot be bound by any rate of exchange used. Christie's is not responsible for any error (human or otherwise), omission or breakdown in providing these services.

8 SUCCESSFUL BIDS

Unless the **auctioneer** decides to use his or her discretion as set out in paragraph C3 above, when the **auctioneer's** hammer strikes, we have accepted the last bid. This means a contract for sale has been formed between the seller and the successful bidder. We will issue an invoice only to the registered bidder who made the successful bid. While we send out invoices by mail and/or email after the auction, we do not accept responsibility for telling you whether or not your bid was successful. If you have bid by written bid, you should contact us by telephone or in person as soon as possible after the auction to get details of the outcome of your bid to avoid having to pay unnecessary storage charges.

9 LOCAL BIDDING LAWS

You agree that when bidding in any of our sales that you will strictly comply with all local laws and regulations in force at the time of the sale for the relevant sale site.

D THE BUYER'S PREMIUM AND TAXES

1 THE BUYER'S PREMIUM

In addition to the **hammer price**, the successful bidder agrees to pay us a **buyer's premium** on the **hammer price** of each **lot** sold. On all **lots** we charge 25% of the **hammer price** up to and including US\$300,000, 20% on that part of the **hammer price** over US\$300,000 and up to and including US\$4,000,000, and 13.5% of that part of the **hammer price** above US\$4,000,000.

2 TAXES

The successful bidder is responsible for any applicable taxes including any sales or use tax or equivalent tax wherever such taxes may arise on the **hammer price**, the **buyer's premium**, and/or any other charges related to the **lot**.

For **lots** Christie's ships to or within the United States, a sales or use tax may be due on the **hammer price**, **buyer's premium**, and/or any other charges related to the **lot**, regardless of the nationality or citizenship of the successful bidder. Christie's will collect sales tax where legally required. The applicable sales tax rate will be determined based upon the state, county, or locale to which the **lot** will be shipped. Christie's shall collect New York sales tax at a rate of 8.875% for any **lot** collected from Christie's in New York.

In accordance with New York law, if Christie's arranges the shipment of a **lot** out of New York State, New York sales tax does not apply, although sales tax or other applicable taxes for other states may apply. If you hire a shipper (other than a common carrier authorized by Christie's), to collect the **lot** from a Christie's New York location, Christie's must collect New York sales tax on the **lot** at a rate of 8.875% regardless of the ultimate destination of the **lot**.

If Christie's delivers the **lot** to, or the **lot** is collected by, any framer, restorer or other similar service provider in New York that you have hired, New York law considers the **lot** delivered to the successful bidder in New York and New York sales tax must be imposed regardless of the ultimate destination of the **lot**. In this circumstance, New York sales tax will apply to the **lot** even if Christie's or a common carrier (authorized by Christie's that you hire) subsequently delivers the **lot** outside New York.

Successful bidders claiming an exemption from sales tax must provide appropriate documentation to Christie's prior to the release of the **lot** or within 90 days after the sale, whichever is earlier. For shipments to those states for which Christie's is not required to collect sales tax, a successful bidder may have a use or similar tax obligation. It is the successful bidder's responsibility to pay all taxes due. Christie's recommends you consult your own independent tax advisor with any questions.

E WARRANTIES

1 SELLER'S WARRANTIES

For each **lot**, the seller gives a **warranty** that the seller:

- is the owner of the **lot** or a joint owner of the **lot** acting with the permission of the other co-owners or, if the seller is not the owner or a joint owner of the **lot**, has the permission of the owner to sell the **lot**, or the right to do so in law; and
- has the right to transfer ownership of the **lot** to the buyer without any restrictions or claims by anyone else.

If either of the above **warranties** are incorrect, the seller shall not have to pay more than the **purchase price** (as defined in paragraph F1 (a) below) paid by you to us. The seller will not be responsible to you for any reason for loss of profits or business, expected savings, loss of opportunity or interest, costs, damages, **other damages** or expenses. The seller gives no **warranty** in relation to any **lot** other than as set out above and, as far as the seller is allowed by law, all **warranties** from the seller to you, and all other obligations upon the seller which may be added to this agreement by law, are excluded.

2 OUR AUTHENTICITY WARRANTY

We warrant, subject to the terms below, that the **lots** in our sales are **authentic** (our "**authenticity warranty**"). If, within 5 years of the date of the auction, you give notice to us that your **lot** is not **authentic**, subject to the terms below, we will refund the **purchase price** paid by you. The meaning of **authentic** can be found in the glossary at the end of these Conditions of Sale. The terms of the **authenticity warranty** are as follows:

- It will be honored for claims notified within a period of 5 years from the date of the auction. After such time, we will not be obligated to honor the **authenticity warranty**.
- It is given only for information shown in **UPPERCASE type** in the first line of the **catalogue description** (the "**Heading**"). It does not apply to any information other than in the **Heading** even if shown in **UPPERCASE type**.
- The **authenticity warranty** does not apply to any **Heading** or part of a **Heading** which is **qualified**. **Qualified** means limited by a clarification in a **lot's catalogue description** or by the use in a **Heading** of one of the terms listed in the section titled **Qualified Headings** on the page of the catalogue headed "Important Notices and Explanation of Cataloguing Practice". For example, use of the term "ATTRIBUTED TO..." in a **Heading** means that the **lot** is in Christie's opinion probably a work by the named artist but no **warranty** is provided that the **lot** is the work of the named artist. Please read the full list of **Qualified Headings** and a **lot's full catalogue description** before bidding.
- The **authenticity warranty** applies to the **Heading** as amended by any **Saleroom Notice**.
- The **authenticity warranty** does not apply where scholarship has developed since the auction leading to a change in generally accepted opinion. Further, it does not apply if the **Heading** either matched the generally accepted opinion of experts at the date of the auction or drew attention to any conflict of opinion.
- The **authenticity warranty** does not apply if the **lot** can only be shown not to be **authentic** by a scientific process which, on the date we published the catalogue, was not available or generally accepted for use, or which was unreasonably expensive or impractical, or which was likely to have damaged the **lot**.
- The benefit of the **authenticity warranty** is only available to the original buyer shown on the invoice for the **lot** issued at the time of the sale and only if on the date of the notice of claim, the original buyer is the full owner of the **lot** and the **lot** is free from any claim, interest or restriction by anyone else. The benefit of this **authenticity warranty** may not be transferred to anyone else.
- In order to claim under the **authenticity warranty** you must:
 - give us written notice of your claim within 5 years of the date of the auction. We may require full details and supporting evidence of any such claim;
 - at Christie's option, we may require you to provide the written opinions of two recognised experts in the field of the **lot** mutually agreed by you and us in advance confirming that the **lot** is not **authentic**. If we have any doubts, we reserve the right to obtain additional opinions at our expense; and
 - return the **lot** at your expense to the saleroom from which you bought it in the **condition** it was in at the time of sale.
- Your only right under this **authenticity warranty** is to cancel the sale and receive a refund of the **purchase price** paid by you to us. We will not, under any circumstances, be required to pay you more than the **purchase price** nor will we be liable for any loss of profits or business, loss of opportunity or value, expected savings or interest, costs, damages, **other damages** or expenses.
- Books**. Where the **lot** is a book, we give an **additional warranty** for 21 days from the date of the auction that any **lot** is defective in text or illustration, we will refund your **purchase price**, subject to the following terms:
 - This **additional warranty** does not apply to:
 - the absence of blanks, half titles, tissue guards or advertisements, damage in respect of bindings, stains, spotting, marginal tears or other defects not affecting completeness of the text or illustration;
 - drawings, autographs, letters or manuscripts, signed photographs, music, atlases, maps or periodicals;
 - books not identified by title;
 - lots** sold without a printed **estimate**;
 - books which are described in the catalogue as sold not subject to return; or
 - defects stated in any **condition report** or announced at the time of sale.

- To make a claim under this paragraph you must give written details of the defect and return the **lot** to the sale room at which you bought it in the same **condition** as at the time of sale, within 21 days of the date of the sale.
- South East Asian Modern and Contemporary Art and Chinese Calligraphy and Painting**. In these categories, the **authenticity warranty** does not apply because current scholarship does not permit the making of definitive statements. Christie's does, however, agree to cancel a sale in either of these two categories of art where it has been proven the **lot** is a forgery. Christie's will refund to the original buyer the **purchase price** in accordance with the terms of Christie's Authenticity Warranty, provided that the original buyer notifies us with full supporting evidence documenting the forgery claim within twelve (12) months of the date of the auction. Such evidence must be satisfactory to us that the property is a forgery in accordance with paragraph E2(h)(ii) above and the property must be returned to us in accordance with E2h(iii) above. Paragraphs E2(b), (c), (d), (e), (f) and (g) and (i) also apply to a claim under these categories.

3 YOUR WARRANTIES

- You warrant that the funds used for settlement are not connected with any criminal activity, including tax evasion, and you are neither under investigation, nor have you been charged with or convicted of money laundering, terrorist activities or other crimes.
- where you are bidding on behalf of another person, you warrant that:
 - you have conducted appropriate customer due diligence on the ultimate buyer(s) of the **lot(s)** in accordance with all applicable anti-money laundering and sanctions laws, consent to us relying on this due diligence, and you will remain for a period of not less than 5 years the documentation evidencing the due diligence. You will make such documentation promptly available for immediate inspection by an independent third-party auditor upon our written request to do so;
 - the arrangements between you and the ultimate buyer(s) in relation to the **lot** or otherwise do not, in whole or in part, facilitate tax crimes;
 - you do not know, and have no reason to suspect, that the funds used for settlement are connected with, the proceeds of any criminal activity, including tax evasion, or that the ultimate buyer(s) are under investigation, or have been charged with or convicted of money laundering, terrorist activities or other crimes.

F PAYMENT

1 HOW TO PAY

- Immediately following the auction, you must pay the **purchase price** being:
 - the **hammer price**; and
 - the **buyer's premium**; and
 - any applicable duties, goods, sales, use, compensating or service tax, or VAT.Payment is due no later than by the end of the 7th calendar day following the date of the auction (the "**due date**").
 - We will only accept payment from the registered bidder. Once issued, we cannot change the buyer's name on an invoice or re-issue the invoice in a different name. You must pay immediately even if you want to export the **lot** and you need an export licence.
 - You must pay for **lots** bought at Christie's in the United States in the currency stated on the invoice in one of the following ways:
 - Wire transfer
JP Morgan Chase Bank, N.A.,
270 Park Avenue, New York, NY 10017;
ABA# 021000021; FBO: Christie's Inc.;
Account # 957-107978,
for international transfers, SWIFT: CHASUS33.
 - Credit Card.
We accept Visa, MasterCard, American Express and China Union Pay. Credit card payments at the New York premises will only be accepted for New York sales. Christie's will not accept credit card payments for purchases in any other sale site.

To make a 'cardholder not present' (CNP) payment, you must complete a CNP authorisation form which you can get from our Post-Sale Services. You must send a completed CNP authorisation form by fax to +1 212 636 4939 or you can mail to the address below. Details of the conditions and restrictions applicable to credit card payments are available from our Post-Sale Services, whose details are set out in paragraph (d) below.

- Cash

We accept cash payments (including money orders and traveller's checks) subject to a maximum global aggregate of US\$7,500 per buyer per year at our Post-Sale Services only

- Bank Checks
You must make these payable to Christie's Inc. and there may be conditions.
- Checks
You must make checks payable to Christie's Inc. and they must be drawn from US dollar accounts from a US bank.
- You must quote the sale number, your invoice number and client number when making a payment. All payments sent by post must be sent to: Christie's Inc. Post-Sale Services, 20 Rockefeller Center, New York, NY 10020.
- For more information please contact our Post-Sale Services by phone at +1 212 636 2650 or fax at +1 212 636 4939 or email PostSaleUS@christies.com.

2 TRANSFERRING OWNERSHIP TO YOU

You will not own the **lot** and ownership of the **lot** will not pass to you until we have received full and clear payment of the **purchase price**, even in circumstances where we have released the **lot** to you.

3 TRANSFERRING RISK TO YOU

The risk in and responsibility for the **lot** will transfer to you from whichever is the earlier of the following:

- When you collect the **lot**; or
- At the end of the 30th day following the date of the auction or, if earlier, the date the **lot** is taken into care by a third party warehouse as set out on the page headed 'Storage and Collection', unless we have agreed otherwise with you.

4 WHAT HAPPENS IF YOU DO NOT PAY

- If you fail to pay us the **purchase price** in full by the **due date**, we will be entitled to do one or more of the following (as well as enforce our rights under paragraph F5 and any other rights or remedies we have by law):
 - we can charge interest from the **due date** at a rate of up to 1.34% per month on the unpaid amount due;
 - we can cancel the sale of the **lot**. If we do this, we may sell the **lot** again, publicly or privately on such terms we shall think necessary or appropriate, in which case you must pay us any shortfall between the **purchase price** and the proceeds from the resale. You must also pay all costs, expenses, losses, damages and legal fees we have to pay or may suffer and any shortfall in the seller's commission on the resale;
 - we can pay the seller an amount up to the net proceeds payable in respect of the amount bid by your default in which case you acknowledge and understand that Christie's will have all of the rights of the seller to pursue you for such amounts;
 - we can hold you legally responsible for the **purchase price** and may begin legal proceedings to recover it together with other losses, interest, legal fees and costs as far as we are allowed by law;
 - we can take what you owe us from any amounts which we or any company in the **Christie's Group** may owe you (including any deposit or other part-payment which you have paid to us);
 - we can, at our option, reveal your identity and contact details to the seller;
 - we can reject at any future auction any bids made by or on behalf of the buyer or to obtain a deposit from the buyer before accepting any bids;
 - we can exercise all the rights and remedies of a person holding security over any property in our possession owned by you, whether by way of pledge, security interest or in any other way as permitted by the law of the place where such property is located. You will be deemed to have granted such security to us and we may retain such property as collateral security for your obligations to us; and
 - we can take any other action we see necessary or appropriate.
- If you owe money to us or to another **Christie's Group** company, we can use any amount you do pay, including any deposit or other part-payment you have made to us, or which we owe you, to pay off any amount you owe to us or another **Christie's Group** company for any transaction.

5 KEEPING YOUR PROPERTY

If you owe money to us or to another **Christie's Group** company, as well as the rights set out in F4 above, we can use or deal with any of your property we hold or which is held by another **Christie's Group** company in any way we are allowed to by law. We will only release your property to you after you pay us or the relevant **Christie's Group** company in full for what you owe. However, if we choose, we can also sell your property in any way we think appropriate. We will use the proceeds of the sale against any amounts you owe us and we will pay any amount left from that sale to you.

If there is a shortfall, you must pay us any difference between the amount we have received from the sale and the amount you owe us.

G COLLECTION AND STORAGE

- (a) You must collect purchased **lots** within seven days from the auction (**but note that lots will not be released to you until you have made full and clear payment of all amounts due to us**).
- (b) Information on collecting **lots** is set out on the storage and collection page and on an information sheet which you can get from the bidder registration staff or Christie's Post-Sale Services Department on +1 212 636 2650.
- (c) If you do not collect any **lot** within thirty days following the auction we may, at our option
 - (i) charge you storage costs at the rates set out at www.christies.com/storage.
 - (ii) move the **lot** to another Christie's location or an affiliate or third party warehouse and charge you transport costs and administration fees for doing so and you will be subject to the third party storage warehouse's standard terms and to pay for their standard fees and costs.
 - (iii) sell the **lot** in any commercially reasonable way we think appropriate.
- (d) The Storage conditions which can be found at www.christies.com/storage will apply.
- (e) In accordance with New York law, if you have paid for the **lot** in full but you do not collect the **lot** within 180 calendar days of payment, we may charge you New York sales tax for the **lot**.
- (f) Nothing in this paragraph is intended to limit our rights under paragraph F4.

H TRANSPORT AND SHIPPING

1 SHIPPING

We will enclose a transport and shipping form with each invoice sent to you. You must make all transport and shipping arrangements. However, we can arrange to pack, transport, and ship your property if you ask us to and pay the costs of doing so. We recommend that you ask us for an estimate, especially for any large items or items of high value that need professional packing. We may also suggest other handlers, packers, transporters, or experts if you ask us to do so. For more information, please contact Christie's Post-Sale Services at +1 212 636 2650. See the information set out at www.christies.com/shipping or contact us at PostSaleUS@christie.com. We will take reasonable care when we are handling, packing, transporting, and shipping a **lot**. However, if we recommend another company for any of these purposes, we are not responsible for their acts, failure to act, or neglect.

2 EXPORT AND IMPORT

Any **lot** sold at auction may be affected by laws on exports from the country in which it is sold and the import restrictions of other countries. Many countries require a declaration of export for property leaving the country and/or an import declaration on entry of property into the country. Local laws may prevent you from importing a **lot** or may prevent you selling a **lot** in the country you import it into.

- (a) You alone are responsible for getting advice about and meeting the requirements of any laws or regulations which apply to exporting or importing any **lot** prior to bidding. If you are refused a licence or there is a delay in getting one, you must still pay us in full for the **lot**. We may be able to help you apply for the appropriate licences if you ask us to and pay our fee for doing so. However, we cannot guarantee that you will get one. For more information, please contact Christie's Art Transport Department at +1 212 636 2480. See the information set out at www.christies.com/shipping or contact us at ArtTransportNY@christies.com.
- (b) **Endangered and protected species**
Lots made of or including (regardless of the percentage) endangered and other protected species of wildlife are marked with the symbol ~ in the catalogue. This material includes, among other things, ivory, tortoiseshell, crocodile skin, rhinoceros horn, whalebone certain species of coral, and Brazilian rosewood. You should check the relevant customs laws and regulations before bidding on any **lot** containing wildlife material if you plan to import the **lot** into another country. Several countries refuse to allow you to import property containing these materials, and some other countries require a licence from the relevant regulatory agencies in the countries of exportation as well as importation. In some cases, the **lot** can only be shipped with an independent scientific confirmation of species and/or age, and you will need to obtain these at your own cost.

(c) Lots containing Ivory or materials resembling ivory

If a **lot** contains elephant ivory, or any other wildlife material that could be confused with elephant ivory (for example, mammoth ivory, walrus ivory, helmeted hornbill ivory) you may be prevented from exporting the **lot** from the US or shipping it between US States without first confirming its species by way of a rigorous scientific test acceptable to the applicable Fish and Wildlife authorities. You will buy that **lot** at your own risk and be responsible for any scientific test or other reports required for export from the USA or between US States at your own cost. We will not be obliged to cancel your purchase and refund the **purchase price** if your **lot** may not be exported, imported or shipped between US States, or it is seized for any reason by a government authority. It is your responsibility to determine and satisfy the requirements of any applicable laws or regulations relating to interstate shipping, export or import of property containing such protected or regulated material.

(d) Lots of Iranian origin

Some countries prohibit or restrict the purchase, the export and/or import of Iranian-origin "works of conventional craftsmanship" (works that are not by a recognized artist and/or that have a function, (for example: carpets, bowls, ewers, tiles, ornamental boxes). For example, the USA prohibits the import and export of this type of property without a license issued by the US Department of the Treasury, Office of Foreign Assets Control. Other countries, such as Canada, only permit the import of this property in certain circumstances. As a convenience to buyers, Christie's indicates under the title of a **lot** if the **lot** originates from Iran (Persia). It is your responsibility to ensure you do not bid on or import a **lot** in contravention of the sanctions or trade embargoes that apply to you.

(f) Gold

Gold of less than 18ct does not qualify in all countries as 'gold' and may be refused import into those countries as 'gold'.

(g) Watches

Many of the watches offered for sale in this catalogue are pictured with straps made of endangered or protected animal materials such as alligator or crocodile. These **lots** are marked with the symbol Ψ in the catalogue. These endangered species straps are shown for display purposes only and are not for sale. Christie's will remove and retain the strap prior to shipment from the sale site. At some sale sites, Christie's may, at its discretion, make the displayed endangered species strap available to the buyer of the **lot** free of charge if collected in person from the sale site within 1 year of the date of the auction. Please check with the department for details on a particular **lot**.

For all symbols and other markings referred to in paragraph H2, please note that **lots** are marked as a convenience to you, but we do not accept liability for errors or for failing to mark **lots**.

I OUR LIABILITY TO YOU

- (a) We give no **warranty** in relation to any statement made, or information given, by us or our representatives or employees, about any **lot** other than as set out in the **authenticity warranty** and, as far as we are allowed by law, all **warranties** and other terms which may be added to this agreement by law are excluded. The seller's **warranties** contained in paragraph E1 are their own and we do not have any liability to you in relation to those **warranties**.
- (b) (i) We are not responsible to you for any reason (whether for breaking this agreement or any other matter relating to your purchase of, or bid for, any **lot**) other than in the event of fraud or fraudulent misrepresentation by us or other than as expressly set out in these conditions of sale; or
(ii) give any representation, warranty or guarantee or assume any liability of any kind in respect of any **lot** with regard to merchantability, fitness for a particular purpose, description, size, quality, condition, attribution, authenticity, rarity, importance, medium, provenance, exhibition history, literature, or historical relevance. Except as required by local law, any warranty of any kind is excluded by this paragraph.
- (c) In particular, please be aware that our written and telephone bidding services, Christie's LIVE™, **condition** reports, currency converter and saleroom video screens are free services and we are not responsible to you for any error (human or otherwise), omission or breakdown in these services.
- (d) We have no responsibility to any person other than a buyer in connection with the purchase of any **lot**.

- (e) If, in spite of the terms in paragraphs I(a) to (d) or E2(i) above, we are found to be liable to you for any reason, we shall not have to pay more than the **purchase price** paid by you to us. We will not be responsible to you for any reason for loss of profits or business, loss of opportunity or value, expected savings or interest, costs, damages, or expenses.

J OTHER TERMS

1 OUR ABILITY TO CANCEL

In addition to the other rights of cancellation contained in this agreement, we can cancel a sale of a **lot** if: (i) any of your warranties in paragraph E3 are not correct; (ii) we reasonably believe that completing the transaction is, or may be, unlawful; or (iii) we reasonably believe that the sale places us or the seller under any liability to anyone else or may damage our reputation.

2 RECORDINGS

We may videotape and record proceedings at any auction. We will keep any personal information confidential, except to the extent disclosure is required by law. However, we may, through this process, use or share these recordings with another **Christie's Group** company and marketing partners to analyse our customers and to help us to tailor our services for buyers. If you do not want to be videotaped, you may make arrangements to make a telephone or written bid or bid on Christie's LIVE™ instead. Unless we agree otherwise in writing, you may not videotape or record proceedings at any auction.

3 COPYRIGHT

We own the copyright in all images, illustrations and written material produced by or for us relating to a **lot** (including the contents of our catalogues unless otherwise noted in the catalogue). You cannot use them without our prior written permission. We do not offer any guarantee that you will gain any copyright or other reproduction rights to the **lot**.

4 ENFORCING THIS AGREEMENT

If a court finds that any part of this agreement is not valid or is illegal or impossible to enforce, that part of the agreement will be treated as being deleted and the rest of this agreement will not be affected.

5 TRANSFERRING YOUR RIGHTS AND RESPONSIBILITIES

You may not grant a security over or transfer your rights or responsibilities under these terms on the contract of sale with the buyer unless we have given our written permission. This agreement will be binding on your successors or estate and anyone who takes over your rights and responsibilities.

6 TRANSLATIONS

If we have provided a translation of this agreement, we will use this original version in deciding any issues or disputes which arise under this agreement.

7 PERSONAL INFORMATION

We will hold and process your personal information and may pass it to another **Christie's Group** company for use as described in, and in line with, our privacy notice at www.christies.com/about-us/contact/privacy.

8 WAIVER

No failure or delay to exercise any right or remedy provided under these Conditions of Sale shall constitute a waiver of that or any other right or remedy, nor shall it prevent or restrict the further exercise of that or any other right or remedy. No single or partial exercise of such right or remedy shall prevent or restrict the further exercise of that or any other right or remedy.

9 LAW AND DISPUTES

This agreement, and any non-contractual obligations arising out of or in connection with this agreement, or any other rights you may have relating to the purchase of a **lot** will be governed by the laws of New York. Before we or you start any court proceedings (except in the limited circumstances where the dispute, controversy or claim is related to proceedings brought by someone else and this dispute could be joined to those proceedings), we agree we will each try to settle the dispute by mediation submitted to JAMS, or its successor, for mediation in New York. If the Dispute is not settled by mediation within 60 days from the date when mediation is initiated, then the Dispute shall be submitted to JAMS, or its successor, for final and binding arbitration in accordance with its Comprehensive Arbitration Rules and Procedures or, if the Dispute involves a non-

U.S. party, the JAMS International Arbitration Rules. The seat of the arbitration shall be New York and the arbitration shall be conducted by one arbitrator, who shall be appointed within 30 days after the initiation of the arbitration. The language used in the arbitral proceedings shall be English. The arbitrator shall order the production of documents only upon a showing that such documents are relevant and material to the outcome of the Dispute. The arbitration shall be confidential, except to the extent necessary to enforce a judgment or where disclosure is required by law. The arbitration award shall be final and binding on all parties involved. Judgment upon the award may be entered by any court having jurisdiction thereof or having jurisdiction over the relevant party or its assets. This arbitration and any proceedings conducted hereunder shall be governed by Title 9 (Arbitration) of the United States Code and by the United Nations Convention on the Recognition and Enforcement of Foreign Arbitral Awards of June 10, 1958.

10 REPORTING ON WWW.CHRISTIES.COM

Details of all **lots** sold by us, including **catalogue descriptions** and prices, may be reported on www.christies.com. Sales totals are **hammer price plus buyer's premium** and do not reflect costs, financing fees, or application of buyer's or seller's credits. We regret that we cannot agree to requests to remove these details from www.christies.com.

K GLOSSARY

auctioneer: the individual **auctioneer** and/or Christie's.

authentic: authentic : a genuine example, rather than a copy or forgery of:

- (i) the work of a particular artist, author or manufacturer, if the **lot** is described in the **Heading** as the work of that artist, author or manufacturer;
- (ii) a work created within a particular period or culture, if the **lot** is described in the **Heading** as a work created during that period or culture;
- (iii) a work for a particular origin source if the **lot** is described in the **Heading** as being of that origin or source; or
- (iv) in the case of gems, a work which is made of a particular material, if the **lot** is described in the **Heading** as being made of that material.

authenticity warranty: the guarantee we give in this agreement that a **lot** is **authentic** as set out in paragraph E2 of this agreement.

buyer's premium: the charge the buyer pays us along with the **hammer price**.

catalogue description: the description of a **lot** in the catalogue for the auction, as amended by any saleroom notice.

Christie's Group: Christie's International Plc, its subsidiaries and other companies within its corporate group.

condition: the physical condition of a **lot**.

due date: has the meaning given to it in paragraph F1(a).

estimate: the price range included in the catalogue or any saleroom notice within which we believe a **lot** may sell. **Low estimate** means the lower figure in the range and **high estimate** means the higher figure. The **mid estimate** is the midpoint between the two.

hammer price: the amount of the highest bid the **auctioneer** accepts for the sale of a **lot**.

Heading: has the meaning given to it in paragraph E2. **lot**: an item to be offered at auction (or two or more items to be offered at auction as a group).

other damages: any special, consequential, incidental or indirect damages of any kind or any damages which fall within the meaning of 'special', 'incidental' or 'consequential' under local law.

purchase price: has the meaning given to it in paragraph F1(a).

provenance: the ownership history of a **lot**.

qualified: has the meaning given to it in paragraph E2 and **Qualified Headings** means the paragraph headed **Qualified Headings** on the page of the catalogue headed 'Important Notices and Explanation of Cataloguing Practice'.

reserve: the confidential amount below which we will not sell a **lot**.

saleroom notice: a written notice posted next to the **lot** in the saleroom and on www.christies.com, which is also read to prospective telephone bidders and notified to clients who have left commission bids, or an announcement made by the **auctioneer** either at the beginning of the sale, or before a particular **lot** is auctioned.

UPPER CASE type: means having all capital letters.

warranty: a statement or representation in which the person making it guarantees that the facts set out in it are correct.

SYMBOLS USED IN THIS CATALOGUE

The meaning of words coloured in **bold** in this section can be found at the end of the section of the catalogue headed 'Conditions of Sale'

◊
Christie's has a direct financial interest in the **lot**.
See Important Notices and Explanation of Cataloguing Practice.

△
Owned by Christie's or another **Christie's Group** company in whole or part. See Important Notices and Explanation of Cataloguing Practice.

◆
Christie's has a direct financial interest in the **lot** and has funded all or part of our interest with the help of someone else. See Important Notices and Explanation of Cataloguing Practice.

□
Bidding by interested parties

•
Lot offered without **reserve** which will be sold to the highest bidder regardless of the pre-sale estimate in the catalogue.

~
Lot incorporates material from endangered species which could result in export restrictions. See Paragraph H2(b) of the Conditions of Sale.

■
See Storage and Collection pages in the catalogue.

Ψ
Lot incorporates material from endangered species that is not for sale and shown for display purposes only. See Paragraph H2(g) of the Conditions of Sale.

Please note that **lots** are marked as a convenience to you and we shall not be liable for any errors in, or failure to, mark a **lot**.

IMPORTANT NOTICES AND EXPLANATION OF CATALOGUING PRACTICE

29/03/19

IMPORTANT NOTICES

△ Property Owned in part or in full by Christie's

From time to time, Christie's may offer a lot which it owns in whole or in part. Such property is identified in the catalogue with the symbol △ next to its lot number. Where Christie's has an ownership or financial interest in every lot in the catalogue, Christie's will not designate each lot with a symbol, but will state its interest in the front of the catalogue.

◊ Minimum Price Guarantees

On occasion, Christie's has a direct financial interest in the outcome of the sale of certain lots consigned for sale. This will usually be where it has guaranteed to the Seller that whatever the outcome of the auction, the Seller will receive a minimum sale price for the work. This is known as a minimum price guarantee. Where Christie's holds such financial interest we identify such lots with the symbol ◊ next to the lot number.

◊◆ Third Party Guarantees/Irrevocable bids

Where Christie's has provided a Minimum Price Guarantee it is at risk of making a loss if the lot fails to sell. Christie's sometimes chooses to share that risk with a third party who agrees prior to the auction to place an irrevocable written bid on the lot. If there are no other higher bids, the third party commits to buy the lot at the level of their irrevocable written bid. In doing so, the third party takes on all or part of the risk of the lot not being sold. Lots which are subject to a third party guarantee arrangement are identified in the catalogue with the symbol ◊◆.

In most cases, Christie's compensates the third party in exchange for accepting this risk. Where the third party is the successful bidder, the third party's remuneration is based on a fixed financing fee. If the third party is not the successful bidder, the remuneration may either be based on a fixed fee or is an amount calculated against the hammer price. The third party may continue to bid for the lot above the irrevocable written bid. Where the third party is the successful bidder, Christie's will report the purchase price net of the fixed financing fee.

Third party guarantors are required by us to disclose to anyone they are advising their financial interest in any lots they are guaranteeing. However, for the avoidance of any doubt, if you are advised by or bidding through an agent on a lot identified as being subject to a third party guarantee, you should always ask your agent to confirm whether or not he or she has a financial interest in relation to the lot

□ Bidding by interested parties

When a party with a direct or indirect interest in the lot who may have knowledge of the lot's reserve or other material information may be bidding on the lot, we will mark the lot with this symbol □. This interest can include beneficiaries of an estate that consigned the lot or a joint owner of a lot. Any interested party that successfully bids on a lot must comply with Christie's Conditions of Sale, including paying the lot's full Buyer's Premium plus applicable taxes.

Post-catalogue notifications

In certain instances, after the catalogue has been published, Christie's may enter into an arrangement or become aware of bidding that would have required a catalogue symbol. In those instances, a pre-sale or pre-lot announcement will be made.

Other Arrangements

Christie's may enter into other arrangements not involving bids. These include arrangements where Christie's has given the Seller an Advance on the proceeds of sale of the lot or where Christie's has shared the risk of a guarantee with a partner without the partner being required to place an irrevocable written bid or otherwise participating in the bidding on the lot. Because such arrangements are unrelated to the bidding process they are not marked with a symbol in the catalogue.

FOR PICTURES, DRAWINGS, PRINTS AND MINIATURES

Terms used in this catalogue have the meanings ascribed to them below. Please note that all statements in this catalogue as to authorship are made subject to the provisions of the Conditions of Sale and **authenticity warranty**. Buyers are advised to inspect the property themselves. Written **condition** reports are usually available on request.

QUALIFIED HEADINGS

In Christie's opinion a work by the artist.

**"Attributed to ..."

In Christie's qualified opinion probably a work by the artist in whole or in part.

**"Studio of ..."/ "Workshop of ..."

In Christie's qualified opinion a work executed in the studio or workshop of the artist, possibly under his supervision.

**"Circle of ..."

In Christie's qualified opinion a work of the period of the artist and showing his influence.

**"Follower of ..."

In Christie's qualified opinion a work executed in the artist's style but not necessarily by a pupil.

**"Manner of ..."

In Christie's qualified opinion a work executed in the artist's style but of a later date.

**"After ..."

In Christie's qualified opinion a copy (of any date) of a work of the artist.

"Signed ..."/"Dated ..."/

"Inscribed ..."

In Christie's qualified opinion the work has been signed/dated/inscribed by the artist.

"With signature ..."/ "With date ..."/

"With inscription ..."

In Christie's qualified opinion the signature/

date/inscription appears to be by a hand other than that of the artist.

The date given for Old Master, Modern and Contemporary Prints is the date (or approximate date when prefixed with 'circa') on which the matrix was worked and not necessarily the date when the impression was printed or published.

*This term and its definition in this Explanation of Cataloguing Practice are a qualified statement as to authorship. While the use of this term is based upon careful study and represents the opinion of specialists, Christie's and the seller assume no risk, liability and responsibility for the **authenticity** of authorship of any **lot** in this catalogue described by this term, and the **Authenticity Warranty** shall not be available with respect to **lots** described using this term.

POST 1950 FURNITURE

All items of post-1950 furniture included in this sale are items either not originally supplied for use in a private home or now offered solely as works of art. These items may not comply with the provisions of the Furniture and Furnishings (Fire) (Safety) Regulations 1988 (as amended in 1989 and 1993, the "Regulations"). Accordingly, these items should not be used as furniture in your home in their current condition. If you do intend to use such items for this purpose, you must first ensure that they are reupholstered, restuffed and/or recovered (as appropriate) in order that they comply with the provisions of the Regulations. These will vary by department.

29/03/19

STORAGE AND COLLECTION

PAYMENT OF ANY CHARGES DUE

Specified **lots** (sold and unsold) marked with a filled square (■) not collected from Christie's by 5.00pm on the day of the sale will, at our option, be removed to Christie's Fine Art Storage Services (CFASS in Red Hook, Brooklyn). Christie's will inform you if the **lot** has been sent offsite.

If the **lot** is transferred to Christie's Fine Art Storage Services, it will be available for collection after the third business day following the sale.

Please contact Christie's Post-Sale Service 24 hours in advance to book a collection time at Christie's Fine Art Services. All collections from Christie's Fine Art Services will be by pre-booked appointment only.

Please be advised that after 50 days from the auction date property may be moved at Christie's discretion. Please contact Post-Sale Services to confirm the location of your property prior to collection.

Tel: +1 212 636 2650

Email: PostSaleUS@christies.com

Operation hours for both Christie's Rockefeller and Christie's Fine Art Storage are from 9:30 am to 5:00 pm, Monday - Friday.

COLLECTION AND CONTACT DETAILS

Lots will only be released on payment of all charges due and on production of a Collection Form from Christie's. Charges may be paid in advance or at the time of collection. We may charge fees for storage if your **lot** is not collected within thirty days from the sale. Please see paragraph G of the Conditions of Sale for further detail.

Tel: +1 212 636 2650

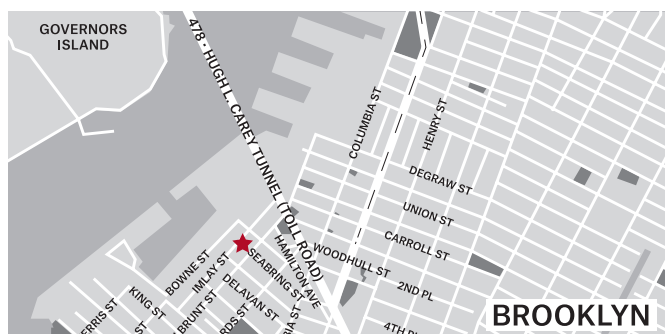
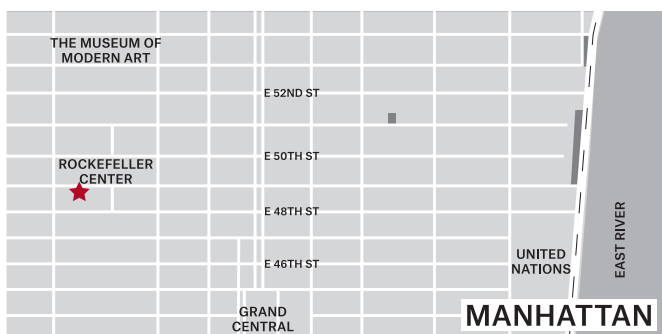
Email: PostSaleUS@christies.com

SHIPPING AND DELIVERY

Christie's Post-Sale Service can organize domestic deliveries or international freight. Please contact them on +1 212 636 2650 or PostSaleUS@christies.com.

Long-term storage solutions are also available per client request. CFASS is a separate subsidiary of Christie's and clients enjoy complete confidentiality. Please contact CFASS New York for details and rates: +1 212 636 2070 or storage@cfass.com

STREET MAP OF CHRISTIE'S NEW YORK LOCATIONS



Christie's Rockefeller Center

20 Rockefeller Plaza, New York 10020

Tel: +1 212 636 2000

nycollections@christies.com

Main Entrance on 49th Street

Receiving/Shipping Entrance on 48th Street

Hours: 9.30 AM - 5.00 PM

Monday-Friday except Public Holidays

Christie's Fine Art Storage Services (CFASS)

62-100 Imlay Street, Brooklyn, NY 11231

Tel: +1 212 974 4500

nycollections@christies.com

Main Entrance on Corner of Imlay and Bowne St

Hours: 9.30 AM - 5.00 PM

Monday-Friday except Public Holidays



IMPORTANT WATCHES

Hong Kong, 27 May 2019

VIEWING

24-26 May 2019

Convention Hall, Hong Kong Convention
and Exhibition Centre, No.1 Harbour Road,
Wanchai, Hong Kong

CONTACT

Cissy NGAN

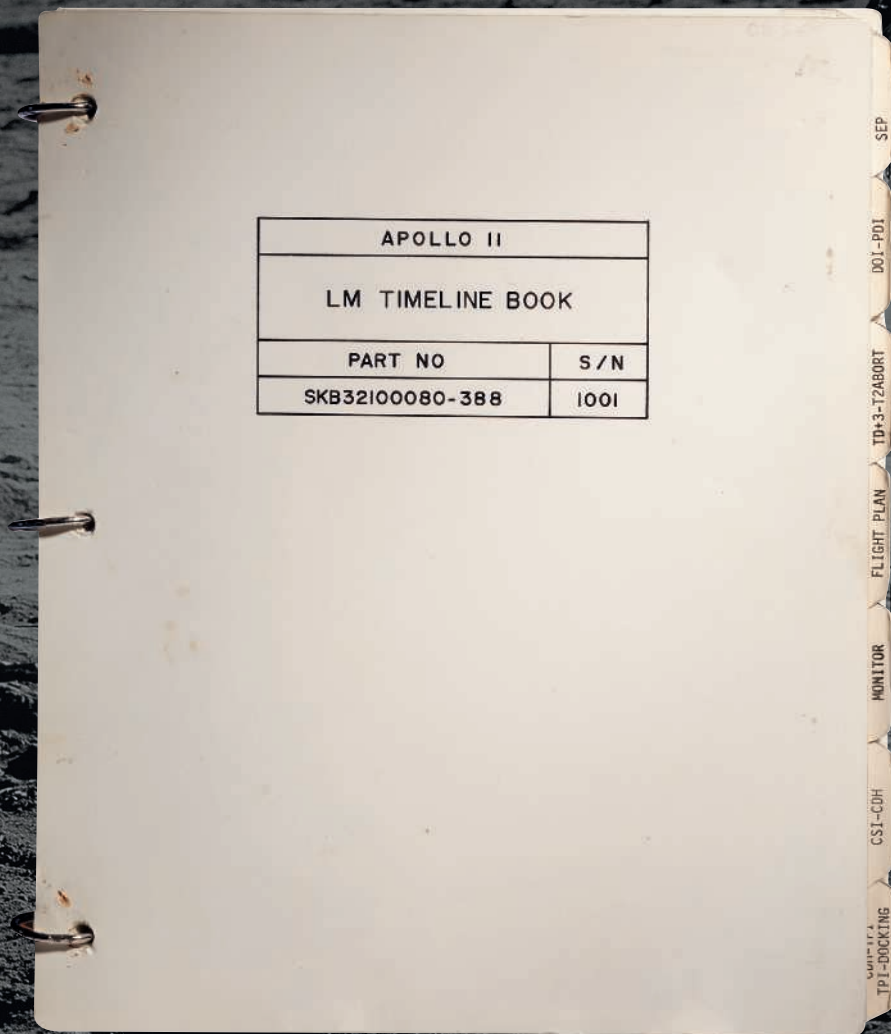
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PATEK PHILIPPE. AN 18K GOLD PERPETUAL
CALENDAR CHRONOGRAPH WRISTWATCH
WITH MOON PHASES, REF. 2499/100,
FOURTH SERIES, MANUFACTURED IN 1983
HKD 5,400,000-8,000,000
USD 700,000-1,000,000.

CHRISTIE'S

The Apollo 11 Lunar Module Timeline Book.
[Houston:] Manned Spacecraft Center, Flight Planning Branch, June 19-July 12, 1969.
Flown aboard the Lunar Module Eagle and annotated by
Neil Armstrong and Buzz Aldrin as they landed on the moon.
\$7,000,000-9,000,000



ONE GIANT LEAP:
CELEBRATING SPACE EXPLORATION 50 YEARS AFTER APOLLO 11
New York, 18 July 2019

VIEWING
4-15 May 2019 | 20th-Century Week
11-17 July 2019
20 Rockefeller Plaza
New York, NY 10020

CONTACT
Christina Geiger
cgeiger@christies.com
+1 212 636 2667

CHRISTIE'S

WRITTEN BIDS FORM

CHRISTIE'S NEW YORK

SUMMA DE ARITHMETICA THE BIRTH OF MODERN BUSINESS

WEDNESDAY 12 JUNE 2019
AT 2.00 PM

20 Rockefeller Plaza
New York, NY 10020

CODE NAME: BONCOMPAGNI
SALE NUMBER: 17644

(Dealers billing name and address must agree with tax exemption certificate. Invoices cannot be changed after they have been printed.)

BID ONLINE FOR THIS SALE AT CHRISTIES.COM

BIDDING INCREMENTS

Bidding generally starts below the **low estimate** and increases in steps (bid increments) of up to 10 per cent. The auctioneer will decide where the bidding should start and the bid increments. Written bids that do not conform to the increments set below may be lowered to the next bidding-interval.

US\$100 to US\$2,000 by US\$100s
US\$2,000 to US\$3,000 by US\$200s
US\$3,000 to US\$5,000 by US\$200, 500, 800

(e.g. US\$4,200, 4,500, 4,800)
US\$5,000 to US\$10,000 by US\$500s
US\$10,000 to US\$20,000 by US\$1,000s
US\$20,000 to US\$30,000 by US\$2,000s
US\$30,000 to US\$50,000 by US\$2,000, 5,000, 8,000

(e.g. US\$32,000, 35,000, 38,000)
US\$50,000 to US\$100,000 by US\$5,000s
US\$100,000 to US\$200,000 by US\$10,000s
Above US\$200,000 at auctioneer's discretion

The auctioneer may vary the increments during the course of the auction at his or her own discretion.

- I request Christie's to bid on the stated **lots** up to the maximum bid I have indicated for each **lot**.
- I understand that if my bid is successful the amount payable will be the sum of the **hammer price** and the **buyer's premium** (together with any applicable state or local sales or use taxes chargeable on the **hammer price** and **buyer's premium**) in accordance with the Conditions of Sale—Buyer's Agreement. The **buyer's premium** rate shall be an amount equal to 25% of the **hammer price** of each **lot** up to and including US\$300,000, 20% on any amount over US\$300,000 up to and including US\$4,000,000 and 13.5% of the amount above US\$4,000,000.
- I agree to be bound by the Conditions of Sale printed in the catalogue.
- I understand that if Christie's receive written bids on a **lot** for identical amounts and at the auction these are the highest bids on the **lot**, Christie's will sell the **lot** to the bidder whose written bid it received and accepted first.
- Written bids submitted on "no reserve" **lots** will, in the absence of a higher bid, be executed at approximately 50% of the **low estimate** or at the amount of the bid if it is less than 50% of the **low estimate**.

I understand that Christie's written bid service is a free service provided for clients and that, while Christie's will be as careful as it reasonably can be, Christie's will not be liable for any problems with this service or loss or damage arising from circumstances beyond Christie's reasonable control.

AUCTION RESULTS: CHRISTIES.COM

08/01/19

Written bids must be received at least 24 hours before the auction begins. Christie's will confirm all bids received by fax by return fax. If you have not received confirmation within one business day, please contact the Bid Department. Tel: +1 212 636 2437 on-line www.christies.com

Client Number (if applicable) 17644 Sale Number

Billing Name (please print) _____

Address _____

City _____ State _____ Zone _____

Daytime Telephone _____ Evening Telephone _____

Fax (Important) _____ Email _____

Please tick if you prefer not to receive information about our upcoming sales by e-mail
I HAVE READ AND UNDERSTOOD THIS WRITTEN BID FORM AND THE CONDITIONS OF SALE — BUYER'S AGREEMENT

Signature _____

If you have not previously bid or consigned with Christie's, please attach copies of the following documents. Individuals: government-issued photo identification (such as a photo driving licence, national identity card, or passport) and, if not shown on the ID document, proof of current address, for example a utility bill or bank statement. Corporate clients: a certificate of incorporation. Other business structures such as trusts, offshore companies or partnerships: please contact the Credit Department at +1 212 636 2490 for advice on the information you should supply. If you are registering to bid on behalf of someone who has not previously bid or consigned with Christie's, please attach identification documents for yourself as well as the party on whose behalf you are bidding, together with a signed letter of authorisation from that party. New clients, clients who have not made a purchase from any Christie's office within the last two years, and those wishing to spend more than on previous occasions will be asked to supply a bank reference.

PLEASE PRINT CLEARLY

Lot number (in numerical order)	Maximum Bid US\$ (excluding buyer's premium)	Lot number (in numerical order)	Maximum Bid US\$ (excluding buyer's premium)

If you are registered within the European Community for VAT/IVA/TVA/BTW/MWST/MOMS Please quote number below:

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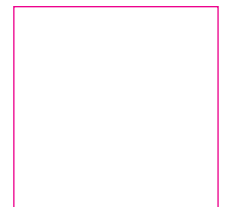
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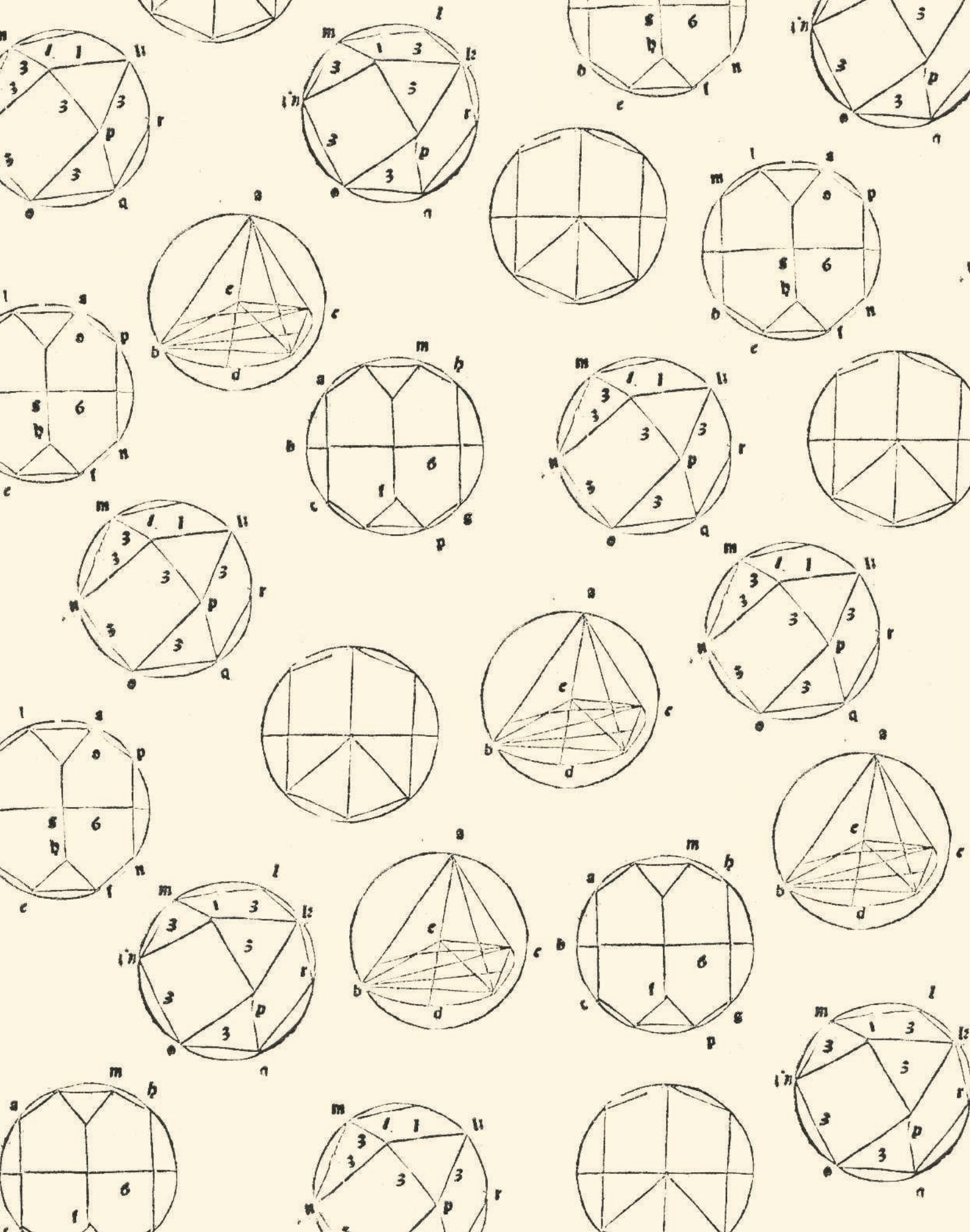
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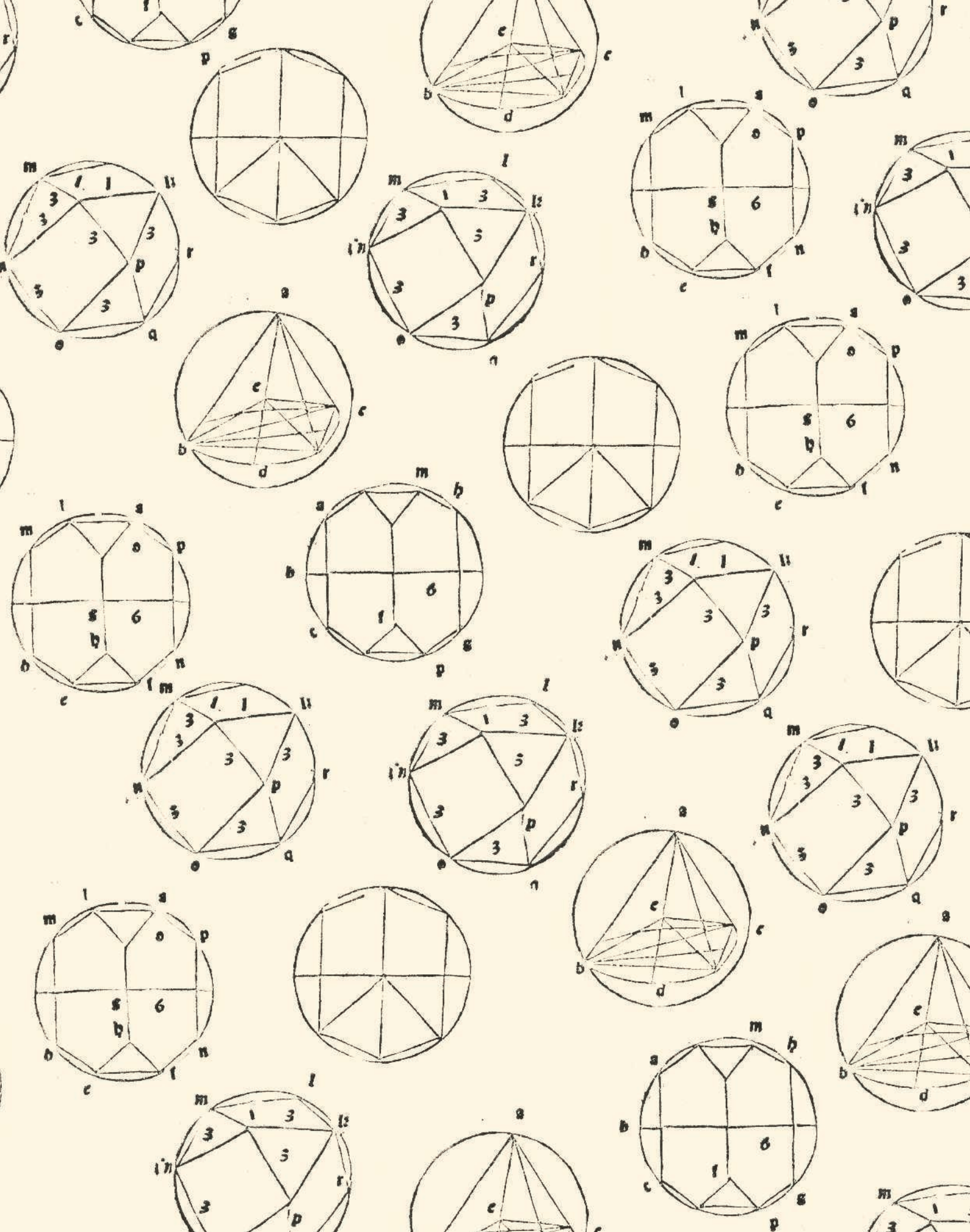
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