

PACIOLI'S CLASSIC ROMAN ALPHABET

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Fra Luca de Pacioli

OF THE SERAPHIC ORDER OF
SAINT FRANCIS



LUCA, ZUNIPERO and AMBROGIO were the religious names of the sons of Bartolomeo, surnamed Pacioli, or Paccioli (apparently the correct, or at least the earliest form of the name), or in Latin Paciolus, of Borgo San Sepolcro. This small, but not undistinguished, town lay within that part of Umbria which earliest came under the influence of St Francis and of his first companions. The Seraphic saint, having preached, was well received by the inhabitants; they gave him the ancient hermitage of Mont Casale nearby, and it was during a sojourn here that there took place the incident in which St Francis commanded Brother Angelo, a noble young follower, who had repelled three famous but out-of-luck brigands, to go after them and, kneeling, to offer them bread and wine. Brother Angelo found the three not far from the Borgo, as recounted in the *Fioretti* (chapter xxvi) by Brother Leo, who also tells of the subsequent conversion of the three. Brother Angelo became Guardian of the Convent of San Casale. Again, the first place to which the saint came, still in an ecstasy, after receiving the stigmata on Mount Alvernia, was the Borgo. Unconsciously and amid cries of "Ecco il Santo" he reached a leper house a mile beyond, and later came back to Mont Casale. All this was in 1224: Francis died in 1226. But the effect on Borgo San Sepolcro remained, and the fame of St Francis was carried through the world by eyewitnesses and

followers of his rule of life. Among the early Franciscan settlements Borgo San Sepolcro long remained faithful to the memory of the saint's works therein.

When the sons of Bartolomeo de Pacioli joined them, the brethren of St Francis formed the most numerous of all the Religious Orders. They had developed a school of theology; they had spread widely; Franciscan scholars were esteemed in every centre of learning, and although they were not, as such, partisans of the Renaissance, they cultivated learning. And in spite of internal dissensions, right and left wing deviations, they remained a society of poor men. For several reasons, therefore, when Luca de Pacioli found he had a vocation to the religious life, he turned to the Order of St Francis; and with the greater confidence since, with the passing of time, postulants of his particularly studious turn of mind had gained a place in its ranks.

Luca's two brothers, who also joined the Order, possessed no talent that was remarked by their contemporaries; indeed we only know of their existence from stray mention. Even the records of Luca himself are so scanty as to make his career nothing but a recital of dates, and a tale of conjectures. First, the absence of documents makes it difficult to assign, with confidence, any year as the date of the birth of Luca de Pacioli. Libri, the historian of the mathematical sciences, confidently places it in 1450, yet, as Giacomo Manzoni points out, 1440 is a safer year. At any rate, it is more likely that, since we know he was teaching mathematics at Perugia in 1475, Luca was then 35 and not 25 years of age. Secondly, all we know of the parents of Luca is that they were probably of good standing. In the preface to *De Divina Proportione*, the author takes a couple of pages to tell those to whom he addressed the book that they were citizens of no mean city; and among the prominent knights, soldiers and signiors named, he tells of the deaths of Benedetto Baiardo, "my near

kinsman," a most valiant Captain-General of infantry, and *con suo e mio nepote*, "his and my nephew, Francesco Paciolo."

No date can be assigned for Luca's entry into the Franciscan Order. We know that he spent some of his early years in Venice at the house of a merchant, Antonio de Rompiasi; likely enough he began to interest himself in accounting while with his Venetian friends. We know too that he attended lectures on mathematics at this time and that he tutored his host's three sons in the art. He was presumably ordained priest sometime when he was about 25 years of age. The Friar's lectures at Perugia in the year 1475 were privately given, but in 1477 he was appointed professor of mathematics in the University, retaining the position until 1480 and compiling during the period his first known work, namely, a treatise on algebra, which was never printed, but remains in manuscript in the Vatican (Codex 3129). His activities during the 1480's seem to have been varied. He passed some time at Zara, in what is now Jugo-Slavia, where he wrote another Algebra, but from the end of 1485 to the spring of 1489 he served a second period at the University of Perugia teaching his old subject. Later in the year 1489 he lectured in Rome, being then of sufficient distinction to lodge with the great Leonbaptista degli Alberti. Within the next year or two, Pacioli was called to be professor in the University of Naples. He was now not merely a distinguished, but a famous scholar. Powerful personages gave him their patronage. Chief among his supporters was the famous Federigo, Duke of Urbino, whose portrait is included in the picture of Fra Luca as a lecturer, which remains in the Art Gallery at Naples, having been painted during the period of his professorship in the University. From time to time he stepped aside from his professional to purely religious duties. The Friar was always on good terms with his superiors and in one of his prefaces paid a tribute to his General, Father Francesco Sanaone of

Brescia. Fra Luca preached the Lent sermons at his native place in the year 1493, and apparently spent the rest of that year on business for his Order at Padua, Assisi and Urbino. In 1494 he obtained leave to go to Venice to superintend the printing of his masterpiece, *Summa de Arithmetica, Geometria, Proportioni et Proportionalita*, published by Paganino de Paganini in the same year. The work brought him great reputation, and, on the strength of it, he was for three years (1496-9) supported as professor in the University of Milan under a salary provided by Lodovico Sforza. Although the *Summa* was characterised by a certain diligence it was not, for all its length, distinguished by originality. Nevertheless, that it has some value is attested by several modern reprints of that portion dealing with double entry book-keeping. It is not claimed that the Friar invented the system but it is not doubted that he was the first writer to describe and to teach it, and modern accountants credit the Friar's *Summa* with laying the foundations of their profession. But it is not admitted by modern mathematicians that Pacioli's writings are important. Dr David Eugene Smith, Emeritus Professor of the History of Mathematics in Columbia University, to whom I referred the question of the value of Pacioli's contributions, kindly allows me to quote his authoritative opinion.

Dr Smith writes that "Pacioli was not a mathematician of any genius. He was merely a compiler of the ideas of others. He had no definite opinions as to the best methods of procedure in any branch of arithmetic, algebra, or geometry. Even in such a simple operation as multiplication he gives no less than eight plans, generally with the fanciful names of the period, (1) 'Multiplicatio bericocoli vel scachierij', by others called 'per organetto', or 'a scaletta'; (2) 'castellucio'; (3) 'p colōna ouer atauoletta'; (4) 'crocetta siue casella'; (5) 'p q̄drilatero'; (6) 'p gelosia ouer graticola'; (7) 'repiegghi'; and (8) 'aschapeçço' (a scapezzo). None of these was original with

him, and none was given the precedence over the others. Similarly in the case of division, he gives ten methods, each with a fanciful name.

"In his treatment of algebra he showed no more originality than in his work in computation. Having no modern symbolism to assist him, his pages on the subject were confined in general to simple problems. For example, the equation which we would write as $x + x^2 = 12$ appears in the *Summa* as 'Trouame .i. n°. che giōta al suo qdrat° facia .12.'

"His edition of Euclid (1509), interesting as an illustration of the typography of the time, made no advance in geometry and exerted little influence. His most important work, from the standpoint of mathematics, was *De Divina Proportione*, but even here there was no evidence of originality. As stated above, Pacioli was essentially a compiler, and even so he lacked in critical ability and in accuracy of statement. So serious were his defects that Jerome Cardan devoted a chapter of his *Arithmetica* (Milan, 1539) to this feature under the title 'De erroribus F. Luca equos vel transferendo non diligenter examinavit, vel describendo per incuriam praeteriit, vel inveniēdo deceptus est,' and the same subject has attracted the attention of other critical writers."

It was in the year 1497 (December 14) that Luca de Pacioli completed his treatise *De Divina Proportione* and presented the manuscript to his patron. To this laborious but (*pace* Dr Smith) unoriginal work his treatise on the right proportions of roman lettering, with which this publication of the Grolier Club is concerned, was added when the book was printed, namely in 1509, by Paganino de Paganini of Venice.

The date of the Friar's death is not recorded.



