TOSCANELLI’S COMETARY OBSERVATIONS: 
SOME NEW EVIDENCE *

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The author has discovered previously unnoted lines 
and several new cometary positions in the manuscripts con-
taining Paolo Toscanelli’s observations of comets between 
1433 and 1472. On the basis of this new evidence she 
concludes that Toscanelli’s techniques of observation and 
charting underwent an evolution through three distinct 
stages: first, qualitative description of cometary paths; 
second, precise location of cometary positions by alignment 
with nearby stars; and finally, probable use of instruments 
giving positions directly in longitude and latitude.

It was not until the fifteenth century that comets were for the first 
time seriously studied and subjected to quantitative measurement by 
astronomers. Comets had from antiquity been classified as atmospheric, 
meteorologic phenomena because they are transient and their motion is 
clearly non-uniform. An overt and successful attack on this view was 
made in the sixteenth century, but a century earlier Paolo Toscanelli in 
Florence and George Peurbach and Regiomontanus in Vienna and Nu-

* A version of this paper was given at the annual meeting of the History of Science Society in Philadelphia, Pennsylvania, December 28, 1976. I was able to travel to and study in Florence during the summer of 1976 due to a very generous grant from The Renaissance Society of America. Most of the work reported in this paper was done with the support of a fellowship from the American Association of University Women. I am pleased to acknowledge my debt to these organizations. A fuller treatment of this research is contained in my doctoral dissertation, *Cometary Theory in Fifteenth Century Europe*, in progress.
remberg quietly began looking at comets in a new way, treating them as if they were celestial bodies. As part of a larger study of this transition in cometary theory, I have been working with Toscanelli's cometary observations, contained in a manuscript in the Biblioteca Nazionale in Florence. They are the earliest quantitative observations I have been able to find.

Paolo dal Pozzo Toscanelli (1397-1482) was, on the admiring testimony of his contemporaries, a learned physician, mathematician, astronomer, astrologer, geographer, and scholar of Greek. He was a life-long friend of Brunelleschi and Nicholas of Cusa and an active and respected member of humanistic circles in Florence. Cusa, Regiomontanus, and Alberti dedicated treatises to him. Yet despite a long life of activity in many disciplines, he left curiously little of his own work. We have the gnomon in the cupola of the Duomo in Florence, which has plausibly been attributed to him; we have a very few letters, including the famous correspondence with Christopher Columbus on the western route to the Indies; we have a treatise on perspective which has recently been attributed to him; and we have this manuscript of cometary observations, which was unknown until the second half of the nineteenth century and which was never referred to by his contemporaries.

Giovanni Celoria did a painstaking analysis of this manuscript in the 1890s and, using Toscanelli's data, was able to compute orbital elements for six comets which appeared between 1433 and 1472. When I had the opportunity to work with the manuscript first hand, I hoped only to be able to verify some of Celoria's transcriptions which had puzzled me, to decipher a few portions which were unclear on the microfilm, and perhaps to get some indication of Toscanelli's charting techniques. I had been working at this for some days when one morning, as the sun was shining obliquely in the window and the overhead lights had not been turned on, I was astonished to notice a number of lines engraved in the paper with some kind of smooth, sharp point. These lines had been quite invisible in a good reading light and evidently were not noticed or

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1 Ms. Banco Rari 30, Biblioteca Nazionale Firenze; old designation Magliabechiano class XI, number 121, fols. 237-58. I wish to thank the Biblioteca Nazionale for allowing the use of this manuscript and the reproduction and publication of some pages from it.