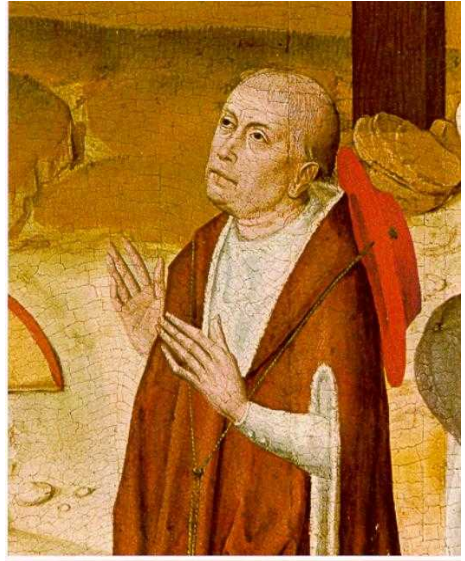


Nicholas of Cusa

German humanist, scientist, mathematician, statesman and philosopher **Nicholas of Cusa** (1401 – August 11, 1464) was a Renaissance scientist ahead of his time. Believing that all knowledge must be based on measurement, he recognized that the weakness of scholastic science was its failure to measure things. He was one of the first advocates of experimental science. Anticipating the work of Nicolaus Copernicus, he discerned a movement in the universe not centered at the earth. He proclaimed the heliocentric



theory of the universe, announced that the stars were other suns, that these suns had other inhabited worlds, and that the universe was infinite. He wrote: “The earth cannot be the center, cannot lack all motion. In fact, it is even necessary that it be moved in such a way that it could be moved infinitely less.”

More than a century before Johannes Kepler, Nicholas claimed the motions of the planets and stars are not circular, and not uniform, writing: “Even if it might seem otherwise to us, neither the sun nor the earth nor any sphere can describe a perfect circle by its motion... nor is a sphere’s or a star’s motion at one moment even precisely equal to their motion at another.” All this was merely an intellectual activity for Nicholas; he did not work out a new astronomical theory. His amazingly accurate beliefs were based almost entirely on his personal speculations and numerological calculations.

Nicholas was born to a wealthy boatman named Johann Cryfts (Krebs) at Cues (Cusa) on the Moselle River. Little is known of his childhood, other than the legend that his love of books and inability to handle a boat once so enraged his father that he knocked his son overboard with an oar. The place

where this is supposed to have occurred is still called the “Schmeissgraben” (“river- blow”). At age twelve Nicholas received a scholarship to study with the Brothers of the Common Life, a group of mystics devoted to experiencing unity with God. Others who studied at this exceptional school at Deventer in the Lowlands included Thomas à Kempis and Desiderius Erasmus. In 1416 Nicholas matriculated at the University of Heidelberg. A year later he attended Italy’s most famous university at Padua where in 1423 he received a doctorate in canon law and then went to the University of Cologne to study divinity. Nicholas’ career as a statesman began in 1421 when he took a prominent role at the Council of Basel. Ordained in 1440 Nicholas served as papal legate traveling throughout Europe preaching and negotiating diplomatic affairs for the Holy See. In 1449 he was proclaimed cardinal-priest in Brixon [now Bressanone], Italy and the next year was consecrated its bishop.

During a journey from Constantinople in 1437, Nicholas had a mystical vision, which provided him with a way of viewing opposites as coincident from the point of view of infinity. In his most famous work, *De Docta Ignorantia* [“Of Learned Ignorance”], he taught that the more we know of our ignorance, the more we attain true knowledge. To explain his doctrine he gave a mathematical analogy. Just as a circle cannot be measured exactly by the measure of polygons, finite minds cannot know the Infinite. All that can be known of the Infinite is the Infinite cannot be known. Nicholas taught that in the Infinite, the circle coincides with the line. He illustrated this paradoxical statement by considering a sequence of circles of ever increasing diameters. He argued that as the circles get larger, a given length of circumference is less curved and more similar to a straight line. Thus the infinite circle coincides with the line. He believed that the circle, which he considered a polygon with the greatest number of possible sides, could be reconciled with the triangle, which is the polygon with the smallest number of sides.

One of the powerful arguments for studying the Quadrivim during the Middle Ages and the

Renaissance was that in using the mathematical disciplines, one was demonstrating the likeness of the human mind and the divine mind. On this matter, Nicholas wrote:

“In creating the world, God used arithmetic, geometry, and likewise astronomy ... For through arithmetic God united things. Through geometry He shaped them, in order that they would thereby attain firmness, stability, and mobility in accordance with these conditions. Through music He proportioned things in such a way that there is not more earth than water in water, air in air, and fire in fire, so that no one element is altogether reducible to another. As a result, it happens that the world-machine cannot perish.... And so God, who created all things in number, weight and measure arranged the elements in an admirable order.”

Nicholas' several mathematical treatises included articles on the problems of cartography, the quadrature of the circle, the theory of numbers, and the reform of the calendar. Calendar reform required tremendous competence in law, mathematics, and religious observance and Nicholas was just the man for the job. A thousand years earlier at the Council of Nicaea, Easter was declared to fall on the Sunday following the full moon following the vernal equinox. By the 15th century, due to an overestimate of the solar year by 11 minutes and 8 seconds, the equinoxes were moving back through Julian calendar time at the rate of a week every nine hundred years. Nicholas proposed a method of stabilizing the calendar, which would require the omission of a leap year once every three hundred and four years. It was not until 1582 that the Gregorian calendar, similar to that proposed by Nicholas, replaced the failing Julian system.

Archduke Sigismund of Austria opposed the reforms Nicholas sought to introduce in the diocese of Brixon. Nicholas was outraged to discover that convents had become little more than brothels, and a source of tax income for Sigismund. When he attempted to replace a certain debauched abbess, she

sought the archduke's support. The conflict intensified and Nicholas was imprisoned, which led to Sigismund being excommunicated. When his long-time friend and fellow reformer Aeneas Sylvius became Pope Pius II, he brought Nicholas to Rome to be his aide. Nicholas prophesied that the world would come to an end in 1734. His own end came on August 11, 1464. On his way to Ancona, he became ill in Todi, Umbria, Papal States, and died. His body rests in his own titular church in Rome, San Pietro in Vincoli (Saint Peter in Chains), but his heart is deposited before the altar in the hospital of Cues, which he founded and to which he bequeathed his entire inheritance. It began with thirty-three elderly men, the same number as the years of the earthly life of Jesus Christ. It still serves the purpose Nicholas intended for it, as a home for the aged and destitute, where they are cared for before their death.

Quotation of the Day: “If we can approach the Divine only through symbols, then it is most suitable that we use mathematical symbols, for those have an indestructible certainty.” – Nicholas of Cusa