Biographical Encyclopedia of Astronomers

Bruno, Giordano

Born Nola, (Campania, Italy), 1548

Died Rome, (Italy), 19 February 1600

Although not an astronomer in any technical sense, Giordano Bruno has a place in the history of cosmology because of his outspoken, if confused, espousal of Copernicanism, and his imaginative pantheistic application of certain aspects of atomism to the cosmos as a whole. He was the first to affirm that stars are suns, and he asserted an infinity of suns accompanied by an infinity of inhabited earths within an infinite Universe.

Bruno was baptized Filippo, but at the age of 15 or 16 he joined the Dominican order and took the name Giordano. He became a priest in the early 1570s and spent some years in Rome teaching the "art of memory," of which he was a master, to students who included Pope Pius V

After being accused of heresy, Bruno left Rome in 1576 and began 15 years of wandering, spending a year or two in each place he visited and everywhere encountering (or positively inspiring) hostility against his aggressively expressed unorthodox views, mainly on points of religion. In Calvinist Geneva he was threatened with execution in 1579. He moved to Toulouse, where he received a doctorate in theology, then on to Paris in 1581, and to London and Oxford in 1583. But in Oxford, Bruno stirred up more trouble and offense, in response to which he returned to London, where he lived at the house of the French ambassador During this residency, he composed and published his purportedly pro-Copernican dialogue *La cena de le Ceneri* (Ash Wednesday Supper), which contains praise for Queen Elizabeth and ridicule of Oxford, where reigns "a constellation of pedantry, ostentation, ignorance, and presumption" (*Opere It*., p. 176). In 1585, Bruno returned to Paris and a year later moved to Wittenberg, but had to leave again in 1588, this time for Prague. In 1589 he moved to Helmstedt, and in 1590 to Frankfurt. Then he made the fatal mistake of returning to Italy.

For a while, during 1591, he was in Padua, hoping to be offered the university's chair of mathematics, a position in fact filled a year later by Galileo Galilei. Late in 1591, Bruno moved to Venice as the guest of a nobleman named Mocenigo, who within a year denounced him as a heretic. Thus began his incarceration and interrogation by the Inquisition, first in Venice and then, from February 1593, in Rome, where, after a long imprisonment, the unrepentant Bruno was burned at the stake.

Because of this "martyrdom" to the Inquisition, Bruno has achieved iconic status among many interpreters of the history of science. The loss of thorough records for the period of his final imprisonment has left the field open to speculation concerning the nature of the charges levied against him. What is clear to serious scholars, however, is that Bruno was not a martyr for Copernicanism, despite the continued mythmaking of some popular accounts. The Catholic Church took no official position on Nicolaus Copernicus until 1616, 16 years after Bruno's death, when *De revolutionibus* was placed on the *Index Librorum Prohibitorum*. Moreover, any reader of *The Ash Wednesday Supper* can see how egregiously Bruno misled Copernicus's theory. In short, if Bruno's fiery execution is no proof that he was a bad theologian, neither does it constitute proof that he was a good scientist

Debates continue concerning Bruno's true significance. The dominant current in his thought was Hermeticism, a mystical, ultimately pantheistic amalgam of ideas based on the supposedly

Mosaic-era writings of Hermes Trismegistus. Bruno uses pantheism's identification of God and cosmos to undermine Aristotle's doctrine of the finitude of the Universe, for:

> it is fitting that an inaccessible divine countenance should have an infinite likeness with infinite parts—such as those countless worlds I have postulated.... There must be innumerable individuals such as those great creatures are (of which our earth is one—the divine mother who gave birth to us, nourishes us, and will finally receive us again into herself). [And] to encompass these innumerable creatures requires an infinite space (*Opere It.*, p. 312; Danielson, p. 142).

Bruno's pantheistic presumption that life is present everywhere in the Universe, combined with his affection for atomism, led him directly to postulate a homogeneous cosmos with stars and earths distributed throughout empty space, and accordingly with no more cosmic center and no more crystalline spheres:

> This entire fantasy of star- and fire-bearing orbs, of axes, of deferent circles, of cranking epicycles - along with plenty of other monstrous notions - is founded merely on the illusory notion that, as it appears, the earth is in the midpoint and center of the universe, while everything else revolves around this fixed stationary earth.... [But] this appearance is the same for those who dwell on the moon and on the other stars sharing the same space, be they earths or suns" (Opere It., p. 344; Danielson p. 143).

Bruno's cosmology, therefore, while it can sound as if it anticipates Isaac Newton's homogeneous absolute space, springs from pantheistic assumptions and in fact obviates the need for a mechanical celestial physics. The animated nature of the heavenly spheres is for Bruno a sufficient explanation for their behavior. For example, "the moon (which is another earth) moves by her own force through the air about the sun" (ibid.). At the same time, such bold speculation about other earths and suns, even if it was purely imaginative, helped to stir the minds of real scientists like Johannes Kepler, John Wilkins, and Christiaan Huygens, whose thoughts of extraterrestrial life were further stimulated by the advent of a technology that Bruno never dreamt of: the telescope. Kepler called Bruno's infinitization of the cosmos "that dreadful philosophy." But Bruno did not need to be scientifically acceptable to be scientifically significant.

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