Kircher's study of the bubonic plague includes his observations with the microscope: he was the first to attribute infectious disease to a microscopic pathogen.

Kircher, Athanasius. *Scrutinium physico-medicum contagiosæ luis*. Romæ: Typis Mascardi, 1658. 8 1/2 inches (220 mm), [16], 252, [16] pp. (last p. blank).

There was hardly a subject that the 17th-century polymath Athanasius Kircher (1602–80) did not touch and adorn. That his ornamentation was at time superfluous and applied at random is a reminder that the road to truth is littered with abandoned wrecks. Although his *Physical-medical Investigation of the Contagious Disease known as the Plague* is an unpretentious small quarto, lacking the engraved plates that make his more ponderous folios so impressive, it nonetheless almost certainly contains the highest proportion of glimpses of truth to wallowing in fantasy of any of Kircher's works. Above all, the book showed that Kircher could rise beyond his impractical linguistico-theologico-scientific pursuits to engage the real world in a time of extreme crisis—like those ivory-tower British academics who were recruited during World War II to Bletchley Park for so quintessentially kirchnerian an activity as code-breaking.

In the Hollywood imagination, the Middle Ages seem to own the patent on the Black Death, but outbreaks of bubonic plague continued to ravage Europe until well into the early modern era. In Rome, in 1656, the plague claimed 15,000 victims in a few months. While physicians, urged by Pope Alexander VII not to abandon their hospitals, tried to save the infected, Kircher applied his scientific knowledge to attempt to find a cure, or at least a proximate cause or two. The *Scrutinium,* published two years later, is his medical report on the epidemic. Although he begins his book conventionally enough, offering the usual theological justification of an angry God with whips and arrows taking it out on Sinful Humanity—*Pestis est flagellum & sagitta Dei ob peccata hominibus immissa* at **Spread 10**—science soon asserts itself. The various traditional causes are assessed—bad air (**Spreads 17–18** and **62–63**), putrefaction (**Spreads 18–20**) and rotting corpses (**Spreads 35–39**). Kircher has a rather mellow patristic view of decay: when good grain goes wrong (as in the direction of ergotism...), he cites in the margin of

Spread 70L the celebrated maxim of Pope Gregory the Great, *Corruptio Optimi Pessima*.

Kircher was very fond of his microscope, and used it to good purpose in the experiments recorded here. He was the first person to use the instrument for medical purposes, examining the blood of infected patients to detect *vermiculi,* tiny microscopic "worms" that Kircher thought might well be a factor in spreading the epidemic—see **Spread 80R.** (One of the charms of early microscopic publications is their delicious use of diminutives—Leeuwenhoek's *animacula*, his "little animals," are the Dutchman's equivalent of Kircher's animated vermicelli). Although Kircher was obviously observing bacteria larger than the plague bacillus (not isolated until 1894), he was on the right track, and limited only by the imperfections of early lenses. He also paid close attention to other vectors of disease. Although Kircher did not detect the actual carrier, the rat-borne flea, he fruitfully enlarged the circle of suspects from God and Man to include insects and familiar animals, including the breath of the cat (**Spread 71R**).

Kircher the antiquary returns to the scene at the end of the book, where **Spreads 122–36** contain an exhaustive chronological listing of the recorded outbreaks of plague, from the dawn of time to his own day. In his search for a cure, after rejecting such diabolical contrivances as the ingenious *Amuletum superstitiosum* at **Spread 107L**, Kircher comes down (like many of his contemporaries) firmly in favor of fighting poison with poison, a disfiguring disease with an ugly animal, recommending a dried toad amulet to absorb the poisonous vapors of the air, like a box of baking soda in the modern American refrigerator. There are many other folkloric or pseudo-scientific pleasures here that the veteran reader of the Jesuit encyclopedist would be disappointed not to discover: the viper cure at **Spread 111R**, the garlic at **103** and the Spanish fly at **102L**. Finally, no book by Kircher would be complete without at least a cameo-role for the tarantula—see **Spreads 40R–41L**.

But we must take our leave of the author as a medical scientist. However imprecise his observations may have been, and however scattergun his approach to etiology, credit for being the first to attribute infectious disease to a microscopic pathogen clearly belongs to Kircher, making the *Scrutinium* his most important scientific publication.