

## Mundus Subterraneus

Athanasius Kircher, facsimile of 1678 edition, Arnaldo Forni Editore, Sala Bolognese, Maggio, Italy. 954 pp., 2011.



This is a reprint of one of the most famous scholarly works of the late Renaissance. Athanasius Kircher (1601 or 1602 – 1680), was a Jesuit scholar who spent his early years in Germany, and in 1633 took a position in Rome at the Collegio Romano under the patronage of Pope Urban VIII. He devoted the rest of his life to scientific research and documenting, in about 44 books, the scientific knowledge of his time. *Mundus Subterraneus* includes most of his work on geology, but also gives extensive coverage of other sciences. The text is in Latin, with introductions in Italian and English by editor Gian Battista Vai, science historian Nicoletta Morello, and popular author Umberto Eco. This is the second facsimile edition. The first was printed in 2004 to coincide with the 32<sup>nd</sup> International Geological Congress, hosted by Italy.

As a contemporary of Galileo and Descartes, Kircher lived in exciting times. His interests ranged over an astonishing number of fields, including every aspect of science, as well as medicine, music, and linguistics. He achieved great fame, but it began to fade even before his death, as more specialized scientists (e.g. Newton) swept away old ideas. But in recent years Kircher's star has risen again, and he has become almost a cult figure. Recent books and seminars elevate his stature to "the last man who knew everything." He has a Facebook page, and shopping bags are sold that bear his portrait. A Web search is informative.

*Mundus Subterraneus* had the broad goal of explaining the entire workings of the Earth. Only about 10% concerns caves and related features. But it is likely that readers, regardless of their field of interest, will be attracted to the entire book. It includes much geology, paleontology, oceanography, and hydraulics, as well as chemistry, biology, meteorology, astronomy, physics, and mathematics.

Shaw (1992) reviews Kircher's contribution to karst and places it in historical context. Kircher's view of karst, and of hydrology in general, was as follows: Seawater is drawn upward through underground conduits by oceanic whirlpools, where it accumulates in vast chambers (*hydrophalaceae*), which feed major rivers and stream caves. At that time, all but a few people assumed that rainfall was not sufficient to supply all the water to rivers, and that it accounted only for minor springs and fluctuations in discharge. How the water rose into mountains and lost its salinity were troubling obstacles, but Kircher tackled them with experiments involving distillation, siphons, etc. The underground flow was also thought to promote the growth of ores and minerals. He described a few caves in the Alps and Dinarides and attempted to explain speleothems. Biospeleology was also covered, but most of his information must have come from other highly imaginative sources, because he included illustrations of fantastic dragon-like creatures never seen before or since.

Kircher was also a serious vulcanologist. He witnessed the eruption of Mt. Aetna and was so fascinated that he arranged to be personally lowered into the crater of the still-smoking Vesuvius for an intimate view. It was clear to him that lava behaved in nearly the same way as water, but was fed by huge chambers of molten rock (*pyrophyllaciae*), which also gave rise to hot springs.

Despite his omnivorous nature, he was no amateur. He invented several optical, magnetic, and acoustical instruments. When the bubonic plague struck in 1656, he cared for the sick and searched for a cure. With a microscope he observed what appeared to be microbes in patients' blood and proposed that diseases were caused and transmitted by these "tiny creatures". *Mundus subterraneus* includes carefully drawn maps of the known world which, though distorted, are remarkable in detail, in view of the limited knowledge and navigational techniques of that time.

Copies of his books were distributed to scholars throughout the world. Speleologists will rejoice to know that the original for the present copy came from the archives of the Italian Speleological Society. Metal plates were employed for nearly perfect reproduction, which includes slight mottling of the cover caused by age, and the slight imperfections of early typesetting and printing, all of which add to the historical interest. The result is like a time capsule from a long-vanished world.

This is one of the most impressive books you will ever see: 954 pages on high-quality paper, 25.2 × 34.3 × 7.1 cm, 4.8 kg, and with a bomb-proof hardcover binding. It costs €184 (now about \$235). The Latin may seem a drawback; but a mere translation would have ruined the impact. To acquaint myself with Kircher's text, I first tried a Latin dictionary with dismal results. I then tried an on-line translator – and a stream of English appeared, as though being channeled through the void of 333 years. Some of the English was difficult to understand, and I found translations to French and German to be clearer, probably because of their more formal structure.

Who would want such a book? Surprisingly, many people. Everyone who sees it has been fascinated by its antiquity, bizarre interpretations, and sheer massiveness. I compliment the publisher for making this and similar volumes available to bibliophiles at a reasonable price (considering its quality and small print run). It would be an unforgettable gift for anyone interested in science – e.g. for honoring a retiring professional, or for any bibliophile, and would be a worthy acquisition for specialized libraries. Readers with an interest in antiquities and fine books should investigate this and other offerings of Forni Editore.

For more information: [www.fornieditore.com/Item.aspx?id=3973&p=0](http://www.fornieditore.com/Item.aspx?id=3973&p=0).

Findlen P. (Ed.), 2007 – *Athanasius Kircher: The Last Man Who Knew Everything*. Routledge, Abingdon, UK, 488 p.

Shaw, T.R., 1992 – *History of Cave Science: The exploration and study of limestone caves, to 1900 (2<sup>nd</sup> ed.)*. Sydney Speleological Society, Sydney, Australia, 338 p.

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