

Thomas Leinkauf, *Mundus combinatus: Studien zur Struktur der barocken Universalwissenschaft, am Beispiel Athanasius Kirchers, SJ, 1602-1680*. Berlin: Akademie Verlag, 1993. Pp. 434.

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If anyone ever lived up to our image of a baroque *Universalgelehrter*, it may have been the Jesuit natural philosopher Athanasius Kircher, whose life and interests spanned most of the 17th century. In his prolific career, Kircher wrote at least 14 major works, on subjects as varied as light (*Ars magna lucis et umbrae*), magnetism (*Magnes sive de arte magnetica*), music (*Musurgia universalis sive Ars magna Consoni et Dissoni*), geology (*Mundus subterraneus*), combinatorics (*Ars magna sciendi*), and Sinology (*China monumentis, qua sacris qua profanis, nec non naturae et artis spectaculis*). Thomas Leinkauf's thorough, penetrating study of Kircher's life and work does a tremendous job of making the Jesuit's work both comprehensible and fascinating, as well as granting us a vision of the inner workings of Kircher's mind, a mind formed both by his period and his position in the history of ideas, and driven by an unusual creativity and capacity for synthesis.

Kircher's life project was the creation of a universal science, which would have as its principal ingredients Lullian combinatorics, fused with neoplatonic presuppositions and extended to include all areas of human inquiry. Leinkauf concedes that many who attempt to study the history of the search for a *scientia universalis* in the late 16th and most of the 17th centuries discover a "labyrinth of facts, references, apparent or actual arbitrariness, fragments of methodical programs and collections of excerpts" (11). This leads many to perceive the search for a universal science as supremely unscientific, and as an aberration in the period's general tendency toward scientific progress. *Scientia universalis* is either ignored, or it is plundered by historians of philosophy seeking to understand the intellectual background out of which more progressive philosophers emerged, while the *scientia* as a whole, as a system, is left behind as worthless. Leinkauf writes that the baroque style and dimensions of Kircher's attempt at a universal science are in themselves quite fascinating, but that the initial fascination dwindles rather quickly, and, were there no system behind the baroque "Schau-Fassade", a researcher would never be able to hold out long enough to write an entire book on such a figure. But, as Leinkauf shows, Kircher's *oeuvre* is more than just a Schau-Fassade of ornate illustrations and wild speculation.

Leinkauf divides the bulk of his work on Kircher into three main sections, reflecting what he sees as Kircher's predominating interests: the concepts of nature, knowledge, and God. There is also a fourth, very interesting section on the anthropological aspects of Kircher's universal science. In this final section, Leinkauf describes Kircher's anthropology as a microcosmos theory, in which the universe as a whole has its center in man, and man his center in God. The universe, as macrocosmos, is literally a reflection or image of man in his corporeal aspect, while man is an *imago Dei* in virtue of his possession of *mens*. While I will not be discussing the anthropology in further detail here, still, in some sense the consideration of any aspect of Kircher's thought yields insight into any other. As Leinkauf notes, Kircher's main interest was in discovering what the disciplines have in common, rather than in sharply dividing them. I shall look first at Leinkauf's treatment of Kircher's *Wissensbegriff*, and shall then look at the *Gottes-* and *Naturbegriffe* together. I fear that in the space provided I can't touch on all of the features of Kircher's thought treated by Leinkauf, but I will try to do justice to the most central components of the Jesuit's system, with particular attention to those that have some bearing on our understanding of Leibniz's philosophical development.

*Kircher's Conception of Knowledge*

All human knowledge comes, on Kircher's view, from one of two sources or *cardines*. The first is combination, by which is meant an *ars combinatoria* derived first and foremost from the writings of the Catalan Aristotelian Ramon Lull (1232-1316). This *ars* is meant to show "the significant structure of the *ars Dei*" or of nature (175), through operations combining the principal attributes of the Godhead with attributes of things in the created world. Lull's combinatory system is based on the nine *dignitates* or absolute, transcendent principles of God, which are familiar to us from Pseudo-Dionysius and others as the 'divine names', and they include goodness, greatness, eternity, power, wisdom, will, virtue, truth, and glory. These are symbolized in Lull's art by the letters B through K, with A reserved for the Absolute itself. It is through these attributes, B-K, that humanity is able to know God. In addition to these absolute principles, nine other relative principles help to explain the operation of the dignities in both the created world and God. These include, difference (which in the case of God explains the possibility of the trinity), concord, beginning, middle, end, equality, contrariety, majority, and minority. The last three are predicable only of things in the created world. In addition, special lists of categories are often devised for particular fields of inquiry.

The aim of the *ars magna* is to show that all the truths of human learning depend on the absolute truth of God. Lull's project is an effort, then, to trace all the arts and sciences back to theology. This will turn out to be a central motivation in Kircher's work as well. For both Lull and Kircher, the *ars magna* is a formal system that reflects perfectly the nature of being itself. As Leinkauf notes, the young Leibniz first came to appreciate the Jesuit for his efforts to develop a calculus in which the characteristics, definitions, and signs of the calculus were meant to stand in a fundamental relation to the intelligible structure of things, in which the nature of the calculus is a necessary result of rational thought, and in which the calculus reflects the divine concepts of things. If there were any failures in Lull's search after an *ars*, in Kircher's view, these did not result from any objective *arcana* in the world, nor from the fact that the world in itself constitutes a *mysterium*. The divine intellect, on Kircher's view, understands everything with absolute distinctness and precision. It is only for us that the light *appears* as darkness.

The second *cardo* of human knowledge is for Kircher analogy. This element of his epistemology has its roots in the negative-theological strain of neoplatonism, particularly in Pseudo-Dionysius. The substance of analogy for Kircher, as Leinkauf explains, lies in the ontological grounding of unity and multiplicity within the horizon of multiplicity (164). Intramundane identity and unity are seen to be possible only in virtue of the fact that they can be traced back to the extramundane unity of God. Innerworldly unity is made possible by the mediation of forces, such as light (*lumen*) and magnetism, which connect the purely spiritual and unified ground of being to the world of multiple, material beings. In Proclus this mediation (*meson, mesotes*) is itself analogy, and it is this rather unfamiliar understanding of analogy that Kircher incorporates into his theory of knowledge.

*Kircher's Conception of God and of Nature*

In his absolute form, the 'A' of Lull's *ars*, God is *nox, caligo inaccessa, fons abyssalis*. This is the God that remains outside of the scope of natural theology. God's triunity, however, can be explained through investigation of the created world. For Kircher, God is the innermost and absolute ground of the singular being of every individual thing. To illustrate this image, Kircher often uses the metaphor of the circle or sphere: God is a circle, the center of which is everywhere, God is the core or center of all being. Kircher's concept of God is informed both by a Christian, trinitarian conception of the supreme being, as well as by a pronounced anti-scholastic and neoplatonic conception of the simplicity and unity of the divine substance, combined with an equally anti-scholastic Lullian conception of the divine intellect. Leinkauf describes both the neoplatonism and the Lullianism as

characteristically Jesuit.

Kircher's philosophy of nature might be described as a physicalization or concretization of his theology. In this respect, Kircher is continuing, and broadening, a long tradition in neoplatonism, which emphasizes the analogy between light and God to such an extent that light comes to be seen as a manifestation of God himself in the world, and so the study of it is properly seen as a branch of theology. In the century preceding Kircher's, the anti-Aristotelian neoplatonist Patrizi (1529-97) described space and light as 'corporeal incorporeals', borderline entities between matter and spirit. Soul itself might also be described in this way for Patrizi, since it is diffused through the physical world, and can only act through the physical. Kircher understands the soul-like *virtutes* or forces, as well as light, magnetism, and sound, to be corporeal incorporeals in the Patrizian sense. This understanding appears most clearly in the works on natural phenomena, such as the *Magnes* (on magnetism), the *Ars magna lucis* (on light), and the *Musurgia* (on sound). In these works, it is Kircher's aim to identify those physical phenomena that operate, as he understands them, on the very boundary between the sensory and the non-sensory, between the material and the spiritual, and to seek to understand them by focusing on the non-sensory, spiritual aspect.

Leinkauf describes the motto "*Tota in toto et tota in qualibet parte*" as the overarching *topos* of Kircher's natural philosophy. For Kircher, soul is distributed throughout each part of the divisible world, while it itself remains indivisible. It has a lifegiving and ordering function in matter. There is no world-soul, but there is some particular soul in every part of nature. Nature is filled with forces or *spiritus*, which are described as the *disiecta* or *diffusa membra* of the universal nature. Because, then, individual spirits come from nature as a whole, nature is "always productively occupied [*beschäftigt*] with itself in a total, intrinsically unlimited reflexion" (68). Every *disiectum membrum* that functions as a particular, individual force in nature, then, reflects or expresses every other part of nature as a shared whole.

Kircher's primary interest in his natural philosophy is the problem of the origins of multiplicity out of unity. This problem often coincides with the problem of the origins of trinity out of unity, for presumably, if it is possible to get three out of one, then higher numbers will not remain all that out of reach. Kircher conceives of the forces of nature as having three different aspects, one of which is God himself, one of which is clearly physical, and the other of which mediates between these two. In magnetism, light, and music, God makes an appearance as the *Magnes centralis*, the *Lux infinita*, and the *Supremus harmosta* respectively. In the case of

light, a favorite Dionysian symbol, *lux secunda* is identified as the rays of the sun, and these are analogous to the son in the Christian trinity. *Lumen*, as opposed to *lux*, is the quantity that fills up space and illuminates it. A similar threefold division can be found in the metaphysics of magnetism and of sound.

Such tripartition is of central importance to Kircher's natural philosophy. Just as in Christian dogma creatures require the mediation of the son of God in order to establish a relationship with God, natural philosophy requires the mediation of a second level, for instance rays in the case of light, in order that the first and unified source, the *lux infinita*, can have its effect on the created, multiple world: the diffusion of *lumen* throughout space. Whatever the function of the metaphysics of light may have been in earlier neoplatonism, Kircher's treatment of light does not amount to a mere metaphor for theology; it is, rather, a theologization of a certain domain of physics, as are Kircher's treatments of magnetism and sound. In this sense, contrary to contemporary usage, analogy is for Kircher something very different from metaphor. Analogy is literal; in virtue of the analogy between God and nature, the study of nature yields knowledge of nature's source. God is *visible* in nature, not merely *detectable*, because the phenomena of physics, as for instance light rays, are in fact, in their highest manifestation, God himself.

In a similar way, all of Kircher's natural philosophy involves God as the ultimate and absolute cause. Though *Deus* is not *Natura*, still the two are so closely connected in Kircher's thought that the one cannot really be discussed without the other. Kircher's theology is a *theologia naturalis*, in which the processes of nature are thought to be a *manifestatio sui* of divinity. For Kircher, following Pseudo-Dionysius and Eriugena, all of nature is theophany. Disciplines such as optics, acoustics, and astronomy are in Kircher's view "quasi-priestly" fields, for he holds nature to be the *ecclesia mundana* and takes the investigation of it to be a sacred activity.

#### *Kircher and Leibniz*

The other great German *Universalgelehrter* of the 17th century was, of course, Leibniz. At the time, Kircher's work looked as though it might turn out to be the more lasting of the two. Leibniz's senior by a few decades, Kircher's work was in many important ways influential on Leibniz's thought. Due to the nature of the publication featuring this review, it seems worthwhile to focus on those aspects of Kircher's thought that made the most visible mark in the work of Leibniz. As I see them, Leibniz's doctrine of expression and his unique brand of pananimism both owe an enormous debt to the influence of the Jesuit. Let us look at each of these in turn, referring as we go to Leinkauf's explication of Kircher for an understanding

of how these Leibnizian theories are related to those of Kircher.

Leibniz's doctrine of expression has it that every part of the universe expresses every other part. Leinkauf writes that for Kircher the doctrine of *omnia in omnibus* meant for the Jesuit that a perfect knowledge of any one thing would yield perfect knowledge of everything, that is, of all of creation. In a system of thought governed by the dictum *omnia in omnibus*, an understanding of any given thing will be taken as a key to understanding the whole. For nothing can be truly, fully extracted from the whole as an object of study. Such a perspective, Leinkauf thinks, turns all areas of inquiry into subdivisions of the study of theology, or, more precisely, of the creation. In this context, the particular becomes as dignified as the universe, and Kircher's passion for seemingly rather specific and isolated subjects of inquiry appears differently: Kircher is not favoring the mundane and gritty over the divine; this is rather simply a distinction that he does not make.

We might also describe Leibniz's system of monads as a variety of pananimism that parts the world soul out into infinitely many distinct souls. This breakup of the world soul's monopoly can also be seen, for instance, in the plastic natures of the Cambridge Platonists, and in the *causae proximae* of Kircher. Leinkauf writes that we find in Kircher a tendency, detectable earlier in Nicholas of Cusa, to desubstantialize general quantities, for example the world soul or the universal nature, both of which are described as *causae remotae*, and to ascribe a higher value to individual, contracted forces of nature or proximal causes. Among these forces Kircher identifies magnetism and the radiation of heat and light, as discussed above, as well as the various biological principles of growth. These basic operators in nature are to be understood in Kircher as spiritual agents, analogous to the substantial form or soul.

Finally, we might credit Kircher with the inspiration for some of the apparently more realistic of Leibniz's writings on organic matter. Leinkauf writes that for Kircher the connection between *vis* and *materia* is most evident in Kircher's doctrine of *Panspermia*. This doctrine holds that every living part of the world contains what would with Leibniz come to be called organic matter, and also contains an immaterial principle of growth and change. The seeds of things are not conceived merely on analogy with semen and vegetable seeds, but literally. In spite of the widespread interpretation of Leibniz's mature metaphysics as a system ontologically committed only to simple, immaterial entities, there is much in all of Leibniz's writings that suggests a conception of the fundamental entities of nature as form-matter compounds, as consisting in a soul-like substantial form, or force, and an organic body. This tendency in Leibniz's metaphysics appears to have

been inspired to a great extent by the discovery of microorganisms. Thanks to Leinkauf's account, we might hypothesize that Leibniz's variety of pananimism also has Kircher's metaphysics as one of its sources.

Leinkauf's study has done scholars of early modern philosophy a tremendous service in uncovering the deeper ontology of one version of 17th-century pananimism, which divided the world soul up into a multiplicity of individual souls or vital forces. Kircher's individualized pananimism is shared in some similar form by the Cambridge Platonists with their plastic natures, and by Leibniz, Conway, and van Helmont the younger with their respective versions of monads. Leinkauf has shown that, for Kircher, the world consists in individual forces which animate the physical and can work their effects only through the physical. Leinkauf describes Kircher's cosmos as one replete with *virtutes* or *vires* balanced on the border between the spiritual and material worlds, in which every real thing exists as a compound of force and matter. In Leibnizian terminology, everything exists both in the kingdom of nature and the kingdom of grace. Kircher, as Leinkauf argues, gives a physical interpretation of the theological and cosmological notion of *omnia in omnibus*. Because we know that this is such an important concept in Leibniz's thought, and because one of his immediate predecessors and teachers saw the concept as providing an account of the "flipsides" nature of the material and the spiritual (rather than a reduction of the material to the spiritual), perhaps we might take this as an incentive to reevaluate our basic understanding of Leibniz's ontology. Catherine Wilson has argued that the monads were modeled to some extent after the animalcula of the microscopists. Recently, both Daniel Garber and Glenn Hartz have argued that Leibniz remained at least partially committed to a conception of substance as form-matter compound until the end of his career. In my opinion, the picture Leinkauf gives of Kircher's metaphysics lends support to the view of his successor's ontology, or at least of a tendency therein, as one in which the natural world—forces, organic bodies and all—is really *there*, and not just a well-founded phenomenon.

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