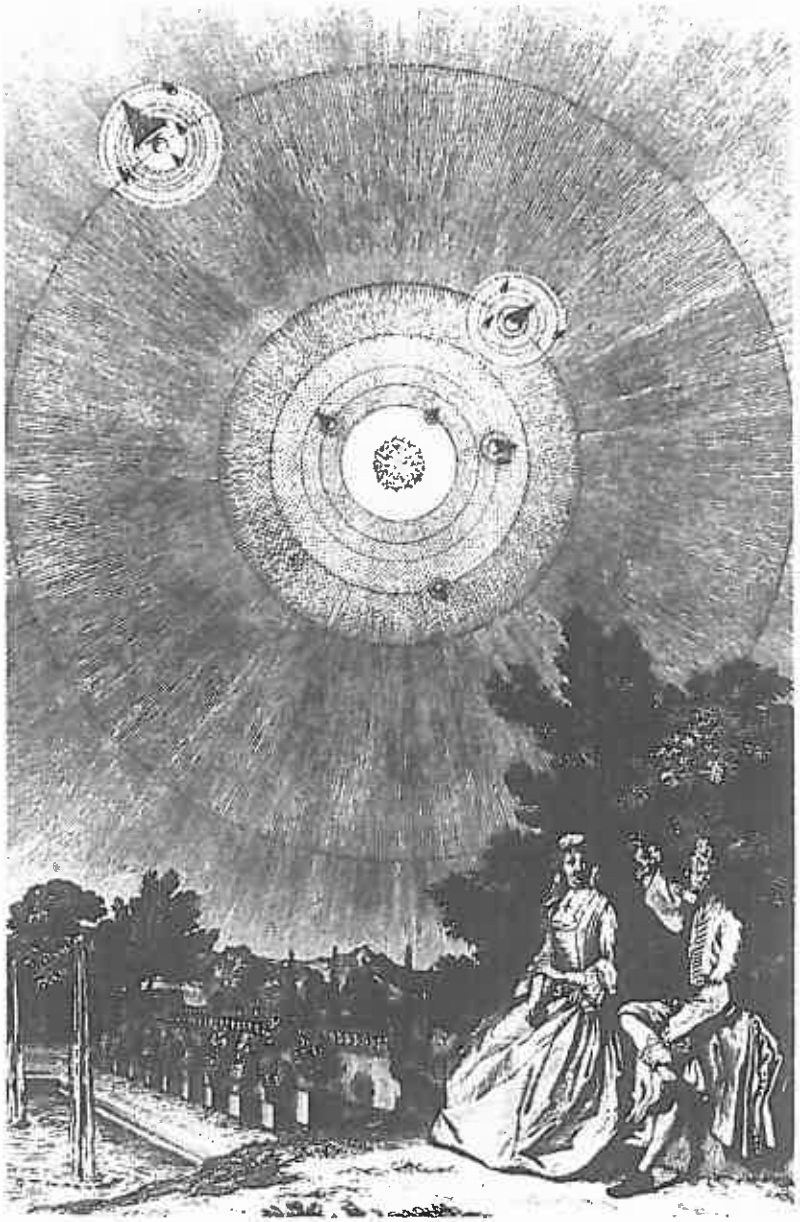

From Bernard de Fontenelle, *Entretiens sur la pluralité des mondes* (The Hague, 1728).

THE SCIENCES IN Enlightened Europe

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13

The Death of Metaphysics in Enlightened Prussia

WILLIAM CLARK

> What before this time period used to be called "metaphysics" has been rooted out root and branch, so to say, thus vanishing from the realm of the sciences. Where can or where may one hear anything of erstwhile ontology, rational psychology, cosmology or even erstwhile natural theology? . . . Since science and common sense have joined hands to work the demise of metaphysics, the strange spectacle has appeared of *a learned folk without any metaphysics.*
>
> Hegel, *Wissenschaf der Logik*, preface to the 1st ed. (1812)

The metaphorical death of traditional metaphysics took place in the context of the Enlightenment. Since then, "metaphysics" has come to connote more a pathological European illness than a science. Those enlightened European scholars and scientists who denounced metaphysics lumped it with superstitions, such as astrology, which the Enlightenment had to combat. Many Prussian academics, however, regarded metaphysics as neither ideology nor illness. Metaphysics was, rather, a *Wissenschaft*, a science, and one that operated by "pure reason," free from all sensual experience, and delivered certainty about its subject matter, which included the most important topics for all humans: the natures of the deity, the cosmos, and the soul. The Prussian Enlightenment, the *Aufklärung*, remained ambivalent about forsaking scientific knowledge about these topics. It was above all academics and academicians in Prussia who fought to save metaphysics: once the handmaiden of theology and queen of sciences, metaphysics should not be consigned to being but the charwoman of science, if not dismissed altogether.

In the light of other enlightenments, German or otherwise, Prussian projects to save metaphysics must have appeared at the time, to say the least, provincial. The later prominence of Prussia should not let us forget its provinciality for a good part of the eighteenth century. Even within the Holy Roman Empire of the German Nation(s), the specter that would be Prussia did not begin to arise until the Seven Years' War (1756–63), a view recorded in Goethe's autobiography, *Dichtung und Wahrheit*. It was during that war, moreover, that

one first began to call Friedrich II Friedrich the Great—albeit for militarism and not for philosophy. Goethe himself belonged to the generation before Prussia, as it were, co-opted German culture. While Hegel and Berlin belong together, the notion of Goethe in Berlin is a bit odd; indeed, this son of Frankfurt am Main felt more at home in Strasbourg (where Parisian influence was less oppressive).

In this chapter, we consider the dilemma of metaphysics as a science in enlightened Prussia and take Hegel's circumscription as a guide: German tradition clove metaphysics into "general metaphysics" as ontology and "special" metaphysics as rational psychology or pneumatology, cosmology, and rational or natural theology.[1] The parts of special metaphysics had emerged from the Cartesian reduction of all being to soul, matter, and God. For want of space, I shall mostly omit consideration of ontology and shall restrict attention to special metaphysics. There are two additional caveats. First, psychology, or pneumatology, will get shorter shrift in favor of philosophical anthropology, whose rise coincided with the demise of traditional metaphysics in the *Aufklärung*. The second caveat is that I shall not do justice to the structure of metaphysics as a demonstrative science.

Mindful of the provinciality of Brandenburg-Prussia, we shall make a journey toward the ever more peripheral: from Halle, to Berlin, to Königsberg. Halle, in the Prussian province of Sachsen-Anhalt, lay in the academic fertile crescent of the eighteenth-century Germanies, a strip containing Halle, Leipzig, Jena, and Göttingen. After considering the lay of the land in Halle, we'll move to Berlin, in Brandenburg, still in the middle of nowhere for a good part of the eighteenth century and a place that many intellectuals pass through, but few remain. The final station will be Königsberg, in Prussia proper and at the periphery of the German political space. In Halle the period 1700–50 falls into view, and here theology, Christian Wolff, and his legacy form the center of attention. In Berlin the years more or less spanning 1730–80 come into focus, for which Leonhard Euler, the Academy of Sciences, and cosmology set the agenda. In Königsberg, 1750–1800 sets the period of analysis, which is devoted to Immanuel Kant, the dissolution of rational theology and cosmology, and the "birth" of anthropology.

Wolff and the University of Halle

"The foundation of the University of Halle forms the most exceptional achievement of the absolute bureaucratic state, unmatched by ages before or

1. See Eberhard, *Kurzer Abriss;* Feder, *Logik und Metaphysik,* esp. 425. On scholastic and Jesuitical foundations, see Lewalter, *Spanisch-jesuitische und deutsch-lutheranische Metaphysik,* 60–65; cf. also Heidegger, *Kant,* 8–9.

after."[2] The foundation at Halle was the inception of the "cameralist" university: the first bureaucratically well-managed university, given little of the traditional corporate privileges of a university, and run instead by ministries in Magdeburg and Berlin. During the eighteenth century, among other Prussian universities and until the foundation of the University of Berlin, Halle was the flagship university. Despite Halle's prominent role in bureaucratic modernism, it was the last university founded in the Germanies for mostly confessional reasons. The two universities serving western Prussian lands were Reformed or Calvinist. Wanting was a university to train Lutheran pastors, academics, and other potential bureaucrats for the Prussian state. So the University of Halle was founded in 1694 as Lutheran. Though religion formed an overriding aim for the foundation, it was hoped the university would be oriented on a pragmatic view of learning and the world. One of the university's first guiding lights, Christian Thomasius, seemed the right person to establish the envisaged pragmatism. Pietism, which advocated a return to revealed religion and the cultivation of piety, soon found a stronghold in Halle. "The place of activity [of the early enlightener] was Halle, and Leipzig to an extent. Most of them were touched by Halle's Pietism. They stand in stark opposition to the antecedent age and its school philosophy, while the next generation, under the lead of Wolff, returns precisely to it."[3] That was the tragedy of Halle and the early *Aufklärung:* their inception lay in a rejection of traditional metaphysics in favor of more pragmatic learning. But after the Wolff "affair," metaphysics, as the apotheosis of reason, became identified with the Prussian *Aufklärung.*

Christian Wolff was first educated in Wroclaw, which the Germans called Breslau. Here Wolff fell under syncretic influences of Jesuit and Lutheran teachers. His university education came at Jena and Leipzig, and his first academic position at the latter. Wolff received a chair as professor of mathematics at Halle in 1706, much thanks to Leibniz. At Halle Wolff and the Pietists never really got along. The Pietists' consternation about Wolff grew in 1720 when his "German Metaphysics," the *Vernünfftige Gedancken von Gott, der Welt und der Seele des Menschen,* appeared, with a rising sun on its title page, later taken as an emblem of enlightenment (see fig. 13.1). In 1721 Wolff held *Oratio de sinarum philosophia,* first published in 1726, as his final oration as prorector at Halle, whereafter by tradition the old prorector installed the new one, Joachim Lange. In this speech, Wolff intimated that Europeans, like the Chinese, might attain virtue without Christian theologians. Lange and his Pietist pals, foes of Wolff's

2. Bornhack, *Geschichte der Preussischen Universitätsverwaltung,* 54. On Halle, see Schrader, *Geschichte der Friedrich-Universität.*

3. Wundt, *Die deutsche Schulphilosophie,* 19. On Thomasius, see Schneiders, *Christian Thomasius.*

Fig. 13.1. Title page to Christian Wolff's "German Metaphysics" (1720). By permission of the Universitätsbibliothek Göttingen.

Neo-Scholasticism, then sought to have him expelled from Halle and all Prussia. They succeeded in 1723. Wolff went to Marburg and became a cause célèbre of the nascent Enlightenment and, to show all things were possible in the *Aufklärung*, was endorsed even by Viennese Jesuits. In 1733, to add insult to injury, the Académie française made him the first German external member since Leibniz. When a German was celebrated in both Vienna and Paris, even Berlin took notice. Wolff was recalled to the University of Halle, where he reconciled himself with Lange the day after returning as professor in 1740. The science of German metaphysics had been reincarnated and canonized in Wolff's Latin textbooks: *Philosophia prima sive ontologia* (1730), *Cosmologia generalis* (1731), *Psychologia rationalis* (1734), and *Theologia naturalis* (1736–41).

The reincarnation of metaphysics in the early Prussian *Aufklärung* was then easily identified with the Wolffian legacy.[4]

In this chapter I am not concerned with the Wolff affair per se. My interest lies in the problems that Lange and others saw in Wolff's metaphysics, as well as its ramifications in Prussia. Theology provides the focus of this section, which has three subsections: "Minds, Machines, Miracles"; "Rational Theology"; "Revelation and Culture."

MINDS, MACHINES, MIRACLES

> Mr. Wolff was teaching the system of preestablished harmony at Halle, when the king asked about this doctrine much spoken of then. A courtier responded to his majesty that, according to this doctrine, all soldiers were nothing but machines and that, should one desert, it would be a necessary consequence of its structure, so that it would be unjust to punish him, as if one might punish a machine for producing such and such a motion. The king was so furious upon hearing this view that he ordered Mr. Wolff to be driven out of Halle [and all Prussia] and to be threatened with hanging if he remained there more than twenty-four hours.[5]

Whether this anecdote gives the proximate cause of Wolff's banishment (and Mr. Wolff actually had forty-eight hours to leave), Euler nonetheless has deftly interwoven many issues surrounding the affair, showing the interconnection of the elements of special metaphysics. If the controversy between Wolff and the Pietists set the terms of the Prussian *Aufklärung* up to 1740, we can see how debates over mechanization and dehumanization, the themes of Simon Schaffer's chapter, arose in Prussia too.

Putting the Pietists' case, Lange said Wolffian metaphysics led to fatalism. He set one of Wolff's big errors in his mechanization of the world and the reduction of humans to automata. To this theme, Lange and his accomplices returned again and again. In his *Caussa Dei*, Lange said Wolff had committed the particular error of Spinoza, by believing "in absolutely mechanical fate." In *Hundert und dreyssig Fragen*, Lange saw Wolff's cosmos as a Spinozist clockwork, "a spiritual automaton." In *Bescheidene . . . Entdeckung*, he said, "The

4. On Pietism and Wolff, see Gierl, "Auf den Boden"; Holloran, "Banishment of Christian Wolff;" Philipp, *Das Werden der Aufklärung*, 16; on Wolff, Lange, Pietists, and Jesuits, see Wolff, *Werke*, esp. ser. 1, 10:170; Ludovici, *Sammlung*, 1:177; Ulmigena, *Send-Schreiben*, 126–46; Schoffler, *Deutscher Osten*, 194–222; Wundt, *Die deutsche Schulphilosophie*, 199–230; Hinrichs, *Preussentum und Pietismus*, 388–441; Schneiders, *Christian Wolff*; Albrecht in Wolff, *Oratio*; Bianco, "Freiheit gegen Fatalismus," esp. 113–16. About thirty-three primary writings are at the University of Gottingen Library (8° phil. III, 705–9).

5. Euler, *Lettres*, vol. 2, letter 84.

Wolffian system holds the whole world, with every thing and event in it, to be a mere machine, similar to a clock, . . . subject to [Spinozist] mechanical *fate.*" The charge of mechanical necessity and fatalism was high on Lange's list against Wolff, portrayed as more a protégé of Spinoza than of Leibniz.[6] One must wonder whether the Wolffian philosophy seemed strangely Calvinist to the officially Lutheran theology of Halle Pietists.

"Everything is thus certain and determined in advance in humans, as everywhere else, and the human spirit is a sort of spiritual automaton."[7] Wolff was at base a Leibnizean, and thus we must delve into that philosophy. Leibniz opposed the mechanical philosophy as preached by Descartes and Hobbes: their philosophy sought to do away with, among other things, "final causes," entelechies, teleology, and so on, at least from natural science. Such a Cartesian-Hobbesian mechanical philosophy rid nature of souls and spirits. Physics and cosmology became a realm of mechanical or "efficient" causes, with teleological or final causes banned to the realm of psychology or pneumatology, if not banished altogether. Seeing himself as a restorer of the ancients and school metaphysics, Leibniz held one must restore teleology, purposiveness, and even intelligence in nature.[8]

Leibniz formulated his "system of preestablished harmony" to explicate the relation of body to soul, of machines to minds, of efficient to final causes, of mechanics to teleology. Taking "clock" as a metaphor for both minds and machines: "Consider two clocks or watches perfectly synchronized. This is possible in three ways. The first consists in the mutual influence of one watch upon the other; the second consists in the care taken by the person keeping them; the third consists in their own [synchronous] exactitude . . . my hypothesis, *the way of preestablished harmony.*"[9] The first system, mutual influence, commonly attributed to Hobbes, was also in part the Cartesian system. The second system, "occasional causes," was Malebranche's, holding that minds and machines, souls and matter, may only affect one another via God, the person keeping them. Against Descartes, Malebranche, and Hobbes, Leibniz conceived the system of preestablished harmony to free minds, including the divine, from all influence over machines, thus to remove the need for constant miracles in the cosmos. The clocks that are the soul and body, mind and machine, were set in a harmony preestablished at conception. For this

6. Lange, *Modesta disquisitio*, 31–66; *Placide vindiciae*, 34, 57, 62; *Caussa Dei*, 108, 125, 360–97; *Hundert und Dreyssig Fragen*, 13–14 (sep. pag.), 8, 11, 68–69; in Ludovici, *Sammlung*, 1:14; Ulmigena, *Send-Schreiben*, esp. 3–18, 31, 65–66, 119–25.

7. Leibniz, *Schriften*, 6:131.

8. Ibid., 4:434–36, 448, 478–79; 6:114–15, 170–73, 182–83, 198–200, 229, 288, 341, 541.

9. Ibid., 4:500; see also Clark, "Scientific Revolution."

reason, Leibniz also found fault in Newton's matter theory, which held that motion was not conserved in collisions at the atomic level, entailing the necessity of regular divine intervention—miracles—to wind up the mainspring of the cosmic order.[10]

Machines and minds versus miracles was the matter. To relate the first two without miracles, Leibniz was driven to his system of preestablished harmony. In *Psychologia rationalis*, Wolff well summarized and expanded the Leibnizean position. Not counting Hobbes, Wolff reduced all systems on the commerce of body and soul to three: (1) the system of physical influx (Cartesian); (2) the system of occasional causes (Malebranchean); (3) the system of preestablished harmony (Leibnizean).[11] The first, the system of physical influx, held that mind might affect matter (and, for materialists, vice versa). Wolff objected that such an influx of mind over matter was a *qualitas occulta* and that conservation of Leibnizean "living power," *vis viva* (mv^2), was also violated. Any motion induced by the mind on our body, a machine, created new *vis viva*, unless God or another spirit annihilated a like quantity of *vis viva*, which would be equivalent to system 2. The system of physical influx, if not reduced to that of occasional causes, allowed for the possibility of a *perpetuum mobile* and of the first sort: one that created new power or force. This system thus compromised the physical integrity of the cosmos and, given the problem with perpetual motion, was held impossible on metaphysical grounds.[12] Wolff held that the second system—occasional causes—needed perpetual miracles, as any intervention by God over minds or machines was a miracle. Miracles were possible but, by principles of perfection, order, and economy, should be as few as possible. Given Wolff's setup, the system of preestablished harmony won by default (the materialist system being beyond the pale), as it entailed but one initial miracle: the original harmony between body and soul. Thereafter, it explained everything naturally, needed no more miracles, and preserved the mechanical order of nature.[13]

The Leibniz-Clarke debate, which ran from 1715 to 1716, bore remarkable similarities to the Wolff-Lange debate after 1723: in view of the doctrine of preestablished harmony between minds and machines, both Leibniz and Wolff had to defend themselves from charges of fatalism. European intellectuals had distanced themselves from belief in astrological fatalism after the 1670s, but

10. See Leibniz, *Schriften*, 4:500–501; 6:136–37, 241, 352; Descartes, *Oeuvres*, 11:354–58; Newton, *Mathematical Principals*, 1:543–47, and query 31 in *Opticks*, 375–406.

11. Wolff, *Werke*, ser. 2, 6:474–75 (§ 553).

12. Ibid., §§ 578, 582. On Leibniz and *perpetuum mobile*, see Schaffer, "Show That Never Ends," 163–65; in general, Gabbey, "Mechanical Philosophy."

13. Wolff, *Werke*, ser. 2, 6:526–29 (§ 603), 556–57 (§ 623), 566 (§ 629).

Leibnizeans now seemed to have fallen into a mechanical fatalism. Leibniz made himself most clear in the long-unpublished *Théodicée*, where he held fate as one of the two great labyrinths of reason and said he accepted neither "Fatum Mahumetanum" nor "Fatum Stoicum," but only Christian fatality, "a certain destiny of all things, regulated by the prescience and providence of God." But in trying to explicate this, he turned to the fatalistic metaphors of deus ex machina and marionettes.[14]

Insofar as the system of preestablished harmony was definitive of Leibniz's final philosophy, Wolff was a Leibnizean. Adopting preestablished harmony, he held body to be a sort of automaton, and he maintained that body and soul could not per se affect one another. Wolff thought he could prove: the cosmos was one spatiotemporal causal nexus; the nature of things did not change; and nothing went out of the world by real annihilation, unless by a miracle. All things were, however, continuously conserved by God, which was a miracle (and a rather Cartesian view). Miracles were possible, but their grounds did not lie in the cosmos, and they could be explained neither from the structures of matter nor from the laws of motion.[15] Wolff's cosmos was a machine, a *horologiam automaton*. It was this notion of the cosmos as clockwork, appearing in Wolff's "German Metaphysics" of 1720, that precipitated great concern by Lange and others. Made pressing by the Pietist critique, the theocosmological problem for a Wolffian became how to unite belief in mechanical determinism and preestablished harmony with disbelief in astrological and mechanical fatalism? The Leibnizean-Wolffian and Prussian solution would be neither (Newtonian) to allow God to clean and repair the cosmic clockwork from time to time, nor (Cartesian) to allow the world to run purely mechanically. The Prussian solution to cosmic order lay in final causes, labeled "metaphysical" by "O" in Diderot's *Encylopédie*.[16]

Along with the system of preestablished harmony, "monadology" formed a central part of Leibnizean metaphysics. Underlying the Leibnizean-Wolffian mechanical order was a realm of organs and souls, or monads. The problem was its nature: whether it was metaphysical or noumenal, as opposed to physical or phenomenal. Though without extension, monads manifested themselves as bodies and "this body is organic when it forms a sort of automaton or machine of nature"; "each organic body of a living being is a sort of divine machine or a natural automaton surpassing all artificial automata infinitely." The monads were psychic entities, with perception, appetite, and even memory. And every monad mirrored the entire world from its own point of view.[17] Leibniz thus underlaid his cosmology with a pneumatology; he set an intelligible order of final causes under the mechanical order of efficient causes. By fusing pneumatology and cosmology, the monadology staked a position pretty far out, even for Wolffians.

A Wolffian member of the Berlin Academy of Sciences, Formey, said Leibniz and Wolff differed in that the former stressed the mirroring and perspectivity of monads, while the latter stressed the interconnectedness and embeddedness of monads so that, given one state of the cosmos, all others in past and future follow. Formey implied Wolff's view was the more deterministic. Gottsched, also a Wolffian, said Leibniz stressed the internal as representational, a psychic power; Wolff supposedly sidestepped the issue, wishing to keep cosmology and pneumatology piously far apart.[18] This Wolffian step may have been taken under Pietist duress, as he was compelled to insulate spirit from mechanical fatalism.

Wolff held that all action was by contiguity, so action at a distance was impossible. Wolffian matter had a passive power *(inertia)* and an active power *(vis motrix)* taken as a tendency *(conatus)*, so that matter was virtually always in continuous motion. Matter did not actually change its own state, owing to inertia and the resistance of contiguous bodies; moreover, the *vis motrix* of each atom or monad tended to move it in every direction at once, giving a sum zero change of state. Wolff saw Leibniz as having held the elements, as monads, to have a power continuously inducing internal changes; Wolff himself posited numerous sorts of elements with different powers: Each body had a fundamental power *(vis primitiva)* grounded in elements, qualitative and nonextended. But, as a good Leibnizean, he held that all matter was elastic, so that Leibnizean *vis viva* (mv^2) was conserved in collisions.[19] These were seen as metaphysical positions.

Wolff said mechanical principles determined bodies by figure, magnitude, place, and motion, whereas physical principles determined phenomena such as chemical mixtures in ways that as far as we could know were not reducible to mere mechanical principles. "Organic" were phenomena whose composi-

14. Leibniz, *Schriften*, 6: 29–32, 65, 135–37, 230, 319–27, 356; 7:355–59, 365, 377, 389–91, 416–19.

15. Wolff, *Werke*, ser. 1, 2:380, 478–88; ser. 2, 4:55–60, 94–97, 396–409, 437–47; 7:44, 823, 828–29, 845; 8:299–300.

16. *Encylopédie*, 2:789; Wolff, *Werke*, ser. 1, 2: §§ 556–61; foreword to vol. 7; ser. 2, 4:62–67, 103; 7:487–89; 8:509. The problem was more complex, as Wolff had to address the necessity versus contingency of laws of nature. On the medieval tradition, see Funkenstein, *Theology and the Scientific Imagination*, chap. 3. On Wolff, see Mayr, *Authority, Liberty, and Automatic Machinery*, 73–77.

17. Leibniz, *Schriften*, 6:599, 618; cf. Baumgarten, *Metaphysica*, § 433.

18. See Formey, *Mélanges*, 2:263–388; Gottsched, *Erste Gründe*, § 389–95.

19. Wolff, *Werke*, ser. 1, 2:368–71; ser. 2, 3: §§ 722–28; 4:112–21, 128, 140–41, 145–48, 229–30, 240, 259, 372–80.

tion depended on structure; all instruments, such as clocks, were thus organic.[20] That position might seem to reduce the organic to the mechanical, though in a backhanded way one might argue the opposite. As we'll see, the problem of structure and the systematic was what led Prussians to a critique of Cartesian-Hobbesian mechanism: machines could only be seen as structural or systematic ensembles when set within a framework, be it of "economics" or teleology, ultimately organic or intelligent. The Leibnizean-Wolffian view saw system or structure as the deus ex machina, the ghost or mind in the machine. This set a teleological in a mechanical order, set final, purposive causes alongside efficient causes. But Wolff held that physics preceded teleology, which, as an "experimental theology," supported physics.[21]

In this discussion of minds, machines, and miracles, we have been considering the Leibnizean-Wolffian monadology and the system of preestablished harmony, which envisaged a "teleo-mechanics," a pneumato-cosmology.[22] Like Leibniz (contra Clarke), Wolff (contra Lange et alia) risked a determinate, mechanistic, and possibly fatalistic teleo-mechanics in order to keep theology and miracles out of the natural world. Astrological fatalism now beyond the pale, mechanical fatalism emerged as the issue. Lange's polemics pushed Wolff from ontological to epistemological formulations: "This world, which exists, we shall call the perceived world." Another critic, Ulmigena, laid his finger on the same point, declining to see it as being held in good faith: Wolff held that the cosmic nexus was not mechanical, but rather only rational, a nexus of things known *(nexus rerum sapiens)*, thus not fatal.[23] Wolff's world-as-perceived was an organic clock, a rational machine or automaton, whose soul inhered in teleology, an intelligible structure. Cosmology was distanced from theology, but bound up closer with pneumatology by the monadology.

RATIONAL THEOLOGY

"Natural theology is the science of God insofar as can be known without faith."[24] "Natural" meant theology based on the natural light of reason, and, as demonstrable, natural was rational theology. The revival of German rational theology may be dated at least from Leibniz, whose aim was to reconcile reason with revelation. Given scholastic terminology, this set "dogmatics" as primary: dogmatic reason showed its conciliation with dogmatic faith, but also its independence, as it was able to arrive at the same dogmas. Here lay the potential

20. Ibid., ser. 2, 4:36–37, 180–81, 210–13, 398.
21. Ibid., ser. 1, 9: § 179; ser. 2, 1(1): §§ 85, 100–107; 3: §§ 886–943; 4:28–29.
22. On teleo-mechanics, see Lenoir, *Strategy of Life*.
23. Wolff, *Werke*, ser. 2, 4:45, 173, 224–25; Ulmigena, *Send-Schreiben*, 124–25.
24. Baumgarten, *Metaphysica*, § 800; cf. Philipp, *Das Werden der Aufklärung*, 18, 72.

problem with rational theology, the most influential of which in the *Aufklärung* was Wolff's, the crown of his science of metaphysics. Like his mechanic-pneumatic cosmos, Wolff's apotheosis of reason in theology found no favor with Lange and Pietists.

We shall follow Kant by dividing rational theology into onto-theology, cosmo-theology, and physico-theology.[25] These three span the field of metaphysics. Working at the hinge of logic and ontology, onto-theology claims to argue purely rationally or a priori, by mere logical analysis, in establishing God's existence as an *ens realissimum*, the absolutely supreme being. Taking up the center of special metaphysics, relating cosmology and theology, cosmo-theology argues from the notion of a given datum: the contingency of the world. Given only the existence of the cosmos as a contingent entity, cosmo-theology seeks, chiefly by the "principle of sufficient reason," to prove the existence of the deity as an *ens necessarium*, the absolutely necessary being. Moving furthest from pure reason, as a bridge from metaphysics to physics and natural history, physico-theology turns to some actual entity in our cosmos for its datum, for instance, a tulip in Candide's garden.

In volume 2 of *Theologia naturalis*, Wolff pursues onto-theology. As essentially ontological, it lies mostly beyond the scope of this essay. So we shall turn now first to cosmo-theology: volume 1 of *Theologia naturalis*. Wolff claims to prove the existence of God through the existence of the human soul, the principle of sufficient reason, and an argument from contingency: our world as a nexus in space-time of contingent entities needs some entity outside it as its cause. As self-caused *ens necessarium*, this God is argued to have the properties known by revealed theology. The deity of metaphysics has an intellect and will, is a spirit, without senses or imagination or memory, and which neither sleeps nor knows fear nor loathing nor laughter. The deity of rational theology has intuitive, nondiscursive knowledge, is possessed of foresight, including all human choices and thoughts, as well of all states of the world. Pure reason's deity cannot will the impossible, though its will is free and may will miracles; indeed, the creation of the world was a miracle. But what can be done naturally, God, adhering to principles of economy, does not work by miracles. God is lord of the world, has humans as servants, and is their just judge. Metaphysics' deity is, in short, like an absolute but enlightened Prussian monarch: "God is the absolutely supreme historian" and "is the absolutely supreme philosopher" (and, from onto-theology, God is a mathematician).[26] So we see part of Wolff's

25. Kant, *Schriften*, 2:63–163; 3:396, 482; also Leibniz, *Schriften*, 6:72, 74, 86.
26. Wolff, *Werke*, ser. 2, 7:140–41, 231, 244, 314–15, 344–45, 402, 438–42, 452–53, 757–58; cf. Leibniz, *Schriften*, 6:297: "All sages agree that chance *(hazard)* is nothing but an apparent entity, just like fortune: it is the ignorance of causes whence it arises."

rational theology, purporting to establish the truth of revealed theology by the natural light of reason.

"In the transformation to the era of the *Aufklärung*, the matter of the garden is a theological question."[27] From onto- and cosmo-theology, we turn to physico-theology, the final sort of rational theology and the metaphysics of the garden. Wolff claimed to have begun physico-theology, a claim belied by the British tradition before him. But he did make physico-theology popular by his "German Teleology," *Vernünfftige Gedancken von den Absichten der natürlichen Dinge* (1724). As teleology, physico-theology was experimental theology confirming rational theology.[28]

German physico-theology blossomed from the 1730s to the 1760s. Ahlwardt wrote a "Thunder Theology" (1745) in which lightening and thunder cried out: "Here is the only true God, who possesses infinity, the God who is alone wise, good, holy, just and all-powerful." Ahlwardt detailed the evidence, and to the atheist who said these phenomena were simply nature, he queried: "Are natural things absolutely necessary and of themselves?" Benemann wrote a "Tulip Theology" and a "Rose Theology" (1741) in which these flowers were praised in registers of types to show that "through these fair witnesses [one] may be led to knowledge of the supreme being." Denso wrote a "Grass Theology" (1750) as a poem. Fabricus outlined a "Fire Theology" (1732) and wrote a "Water Theology" (1734) in which, for instance, the number of rivers on earth was pondered in praise of the Creator. Heinsius penned a rather short "Snow Theology" (1735). The king of physico-theology, Lesser, wrote a "Stone Theology" (1735) amounting to 1,300 pages plus register. Even if humans misused them, stones allowed us to marvel at God's wisdom, despite humans' misuse. Lesser also wrote an "Insect Theology" (1740), in which tiny creatures offered lessons of divine wisdom. Finally, our king wrote a "Snail Theology" (1744), a meaty 984 pages plus register. Of a snail shell Lesser marveled, "What an infinite understanding must God not have? One can rightly conclude from the work of an artist to the mind and talent of the latter." Rathelf wrote a "Locust Theology" (1748–50), containing a natural and human history of locusts, with all attestations of their plagues. Were locusts necessary to the world? No. But they showed us the "wonderfulness" of God. Richter wrote a "Fish Theology" (1754), Rohr a "Plant Theology" (1740), Schierach a "Bee Theology" (1767), and, yes, Zorn a "Bird Theology" (1742–43).[29]

27. Philipp, *Das Werden der Aufklärung*, 163.

28. Wolff, *Werke*, ser. 1, 7: §§ 2–14; ser. 2, 1(1): § 85, 101, 107; see also Leibniz, *Schriften*, 6: 144–45, 165, 264, 545, 605, 621–22. In general, see Philipp, *Das Werden der Aufklärung*, 16–20.

29. Quotations from Ahlwardt, *Bronto-Theologie*, § 63; Benemann, *Die Rose*, 195–96; Lesser, *Lithotheologie*, § 616, and *Insectotheologie*, 511.

To sum up, onto-theology lay at the joint of ontology and logic. Cosmo-theology moved to the center of special metaphysics, joining cosmology and theology, by basing itself on the contingency of the cosmos and seeking to establish the existence and nature of the absolutely necessary being. At the far edge of metaphysics, joining it to natural science, lay physico-theology, which appealed to the marvelous details of nature and their contingency, whence, following cosmo-theology, arose their dependence on an external intelligible and purposive power or mind. Physico-theology sought, indeed, to establish the existence and nature of the absolutely "architectonic" being: God as ultimate architect-artisan. As in the case of minds and machines, teleology emerged here too as a key. Linking theology, pneumatology, and cosmology, teleology was a handmaiden to rational theology. Given impetus from Wolff's "German Teleology," physico-theology, from Ahlwardt to Zorn, embodied a sort of experimental theology confirming rational and even revealed theology.

REVELATION AND CULTURE

Insofar as Prussians under Friedrich the Great soon claimed to speak for all, the reinstatement of Wolff in 1740 seemed to seal the victory of *Aufklärung*. But Lange and the Halle Pietists had ensured that the Prussian *Aufklärung* would proceed neither atheistically nor even deistically, as the Enlightenment had at least in part in France and Britain. The reconciliation of Pietism and Wolffianism had far-reaching consequences for revealed theology. New currents from Britain were important too. They brought not only physico-theology but also new methods into church history and scriptural theology. A sentiment arose that enlightened church historians and nondogmatic theologians had to be impartial, had to put personal faith aside as scholars. This view would come to bear on the possibility of the miracle of revelation and the metaphysics of history.

Within this framework, a new German theological school emerged, the Neologians. The heart of their program upheld, against Deists, the possibility of the miracle of revelation while undermining its content by banishing particular miracles. The neological stress on reason in history won emphasis from Wolffianism: Revealed was supernatural theology, thus miraculous.[30] Revelation and other miracles were metaphysical in the bad sense, since they could not be known by dint of pure reason and lay outside the natural order. With the dissolution of the mediating realm of the preternatural in the seventeenth

30. Wolff, *Werke*, ser. 2, 7:10. See Hinrichs, *Preussentum und Pietismus*, 441; Aner, *Die Theologie*, chaps. 1, 3; Frei, *Eclipse of Biblical Narrative*, 96–103, 114. Taking the University of Gottingen as a barometer, see ibid., 167–73; Heussi, *Mosheim*, chap. 4; Moeller, *Theologie in Göttingen*; Völker, *Kirchengeschichtsschreibung*, 11–13. Edited by Lessing and published anonymously, Reimarus's *Fragmente* embodies the most rationalistic position in the *Aufklärung*.

century, moreover, the gulf between the natural and supernatural, including revelation, widened. In the name of reason, Neologism called for reading the Scriptures almost as a novel, a new "realistic" genre much limiting the supernatural. Mindful of such neological views, and in the light of the emerging bourgeois novel, it is interesting that Germans, unlike French and British, did not develop realistic fiction then, while they did develop analogous sentiments for historical writing and demanded conformity from revelation.[31]

Despite his ambivalent relation to Neologism, Semler at Halle, progeny of Lange and Wolff reconciled, was the leading theologian applying the new historical and philological methods to the Scriptures.[32] He argued that there was an external history of Scripture, which could be considered as a book like any other. Taking this point consequently, and moving to internal history, proved devastating. Hebrew tradition held its Scriptures were revealed, but as per Semler, such revelation could not be verified, so was scientifically questionable. In fact, Semler doubted the Hebrew Scriptures were revealed and thought some parts of the canon were not worthwhile.[33] As for the New Testament, it was difficult to trace the Gospels back beyond the fourth century, making it impossible to assess authenticity. Semler said one must take the Evangelists seriously as human historians. Like "cultural context" for some moderns, "historical circumstances" *(Umstände)* served as shibboleth for Semler. The atemporal meaning sought by a dogmatic theology gave way to a view of the cultural-historical embeddedness of Scripture and its authors. Opposed to dogmatic theologians, Semler's nearly anthropological theology focused on the "singular, local and characteristic of each people and time." Figurative language did not incorporate a universal message; rather, it dated the Scriptures. Semler later engaged in damage control and, trying to put space between himself and the Deists, asserted miracles were not impossible.[34]

But other works of his aimed at eliminating miracles. He claimed the Jews had brought the views of superstitious peoples from their surroundings into the Scriptures; moreover, the origins of miracles in the New Testament must be set in the fourth century, when the Romans sought to create a new mythology to Christianize barbarians. Enlightened Protestants now doubted the validity of miracles in the New Testament, as well as the reports putatively from

31. See Frei, *Eclipse of Biblical Narrative.* On the preternatural, see Daston, "Marvelous Facts."

32. For Aner, *Die Theologie,* 98–112, Semler was at best a lapsed Neologian; for Reill, *German Enlightenment,* 82, he was a leading Neologian; for Frei, *Eclipse of Biblical Narrative,* 61, the greatest one; also see Hornig, *Die Anfänge der historish-kritischen Theologie;* Span, "Auf dem Wege," 81–82.

33. Semler, *Vorbereitung,* 2: § 2; *Abhandlung,* 24, 67–77.

34. Semler, foreword to Baumgarten, *Untersuchungen theologischer Streitigkeiten,* 1(1), §§ 4–5, 9; *Neue Versuche,* 4–8; *Abhandlung,* 41–46; *Vorbereitung,* § 7; *Beantwortung.*

early church history that violated the laws of physics.[35] In his 1776 demonology, Semler claimed he was editing the work of an anonymous author. The author (Semler) claimed the New Testament could be read so that devils and demons did not appear. With some sleight of hand, he got the devils out. Much of Scripture, we hear, was figurative. Thanks to superstition, other parts were full of wonders and devils. The serpent in Genesis was not a devil; besides, serpents could not speak and the Fall did not need a devil. Demonic possession was a figment of unenlightened imaginations. In an appendix, Semler endorsed some of his own above views and traced the belief in devils to a "Jewish mythology," taken from Chaldeans, Greeks, and other pagans. Semler's theological *Aufklärung,* necessitating expulsion of miracles and demons from Scripture, demonized Jews for polluting revelation. Halle's new theology aimed to expunge the "base, **uncultured** *[sic]* manner of thinking of so many enthusiastic Jews." Greeks and Romans were cultured, as opposed to "the actually very incapable and uncultured Jews."[36]

So the ends of Lange and Wolff reconciled, Prussian *Aufklärung* in Halle? "Realistic" and nearly "positivistic" neological views demanded a disenchantment of the Scriptures, now to be read like a realistic novel, where miracles and demons did not exist. This profanation of biblical tradition abetted a demonization of the Jews and allowed for the sacralization of culture. The notion of *Kultur* would be used by Semler's colleague at Halle, F. A. Wolf, to fashion a science of antiquity, for which Egyptians, Hebrews, and Persians only attained "bourgeois policing" *(bürgerliche Policirung)* or "bourgeois civilization," whereas Greeks and Romans attained "higher genuine culture of spirit" *(höherer eigentlicher Geistescultur).* From the science of antiquity, Wolf argued, "Asians and Africans, as not literally cultured, but only rather civilized folks, . . . will be excluded from our borders," as well as "the Arabs, later so important," all of whose works are "left to Orientalists."[37] *Kultur,* with *Geist,* would become part of the secret new metaphysics of the Romantic era.

35. Semler, *Vorbereitung,* 1, § 4; *Versuch einer . . . Dämonologie,* 44–49, 54; *Neue Versuche,* 17; *Versuch einiger . . . Betrachtungen,* 2–6, 37, 40–42.

36. Semler, *Abhandlung,* 44 (quotation); *Versuch einer . . . Dämonologie,* 13–16, 26–28, 44–49, 67–68, 74, 275–77, 300, 313–59.

37. On the above, see Wolf, *Darstellung,* 11–17; in *Encyclopädie,* 8–9, he claims the Hebrews never became a "gelehrte Nation," whereas the Greeks and Romans did. The above two works were based on Wolf's lectures in the late eighteenth century in Halle, then after 1806 in Berlin. An early cultural anthropology was *Grundriss der Geschichte der Menschheit* (1785) by Christoph Meiners—in general, see Linden, *Untersuchungen zum Anthropologiebegriff.* Though Meiners's *Grundriss* of 1785 is a racist work, it was perhaps par for the period. Beyond the pale are his articles in journals he coedited. Here he argued for the natural superiority of the "Germanic-Celtic" folks. The Germans and Celts had "blue eyes and blond hair," and "the Germans surpassed all other Celts, as much in size, strength and beauty, as in the blondness of their hair and the blue and fire in their

Euler and the Berlin Academy of Sciences

The Berlin Academy of Sciences traced its origins to the Royal Brandenburg Society of Sciences, founded at Berlin in 1700, six years after the foundation of the University of Halle. The spirits behind the academy were three: Daniel E. Jablonksi, a court preacher in Berlin, Sophie Charlotte, queen of Brandenburg-Prussia, erstwhile princess electress of Hanover and pupil, correspondent, and patron of the academy's first president, Leibniz. Sophie Charlotte tried to elevate the abysmal state of arts and sciences in Berlin, though often to little avail, given the lack of cash and interest bestowed by the king. Inaugurating a modern German academic lifestyle, Leibniz began commuting between Hanover and Berlin. Sophie Charlotte's death at the age of thirty-six in 1705, Leibniz's death in 1716, and above all the lack of any real funding let the society drift into a moribund state.

Friedrich II wanted to change that on his accession to the throne in 1740. The reforms of the academy in 1743–44 and 1746 say much about Prussian *Aufklärung*. The reform of 1746 abolished the democratic-republican institutional structures and set up a bureaucratic presidency, left vacant after 1759, that Friedrich, the "first servant of the state," might more easily dominate. The notorious mechanization of the state under Friedrich II and his father arose in the context of a bureaucratization of the state, with which metaphysics was strangely related.[38]

The reform of 1743–44, preserved in that of 1746, made an intellectual change in the academy. Though Friedrich II was lukewarm about if not hostile to metaphysics, Prussia showed its provinciality here. Besides the typical sections of other European academies, the Berlin academy acquired a philosophy section, including metaphysics. On 23 May 1740, Crown Prince Friedrich II, disingenuously perhaps, wrote to Wolff, "Good Sir, every thinking and truth-loving person must treasure your newly published work. . . . I treasure it the more, since you have dedicated it to me. Philosophers should be the teachers of the world and of princes. . . . I have read and studied your works for a long time." Less than a week earlier, he had written to Voltaire: These "simple, thinking substances [monads] seem very metaphysical to me. . . . And it seems

eyes." See Meiners and Spittler, *Göttingisches Historisches Magazin* 8 (1787–90): 12; in general, 6 (1790): 387–450; 7(1790): 117–45, 229–30; 8(1790): 1–25, 119–21; *Neues Göttingisches Historisches Magazin* 1 (1792): 17.

38. On bureaucracy and mechanization, see Stollberg-Rilinger, *Der Staat als Maschine*; also see Rosenberg, *Bureaucracy*. On the Berlin Society and Berlin Academy, see Harnack, *Geschichte der königlich Preussischen Akademie*; McClellan, *Science Reorganized*, 68–74; Finster and van den Heuvel, *Liebniz*.

to me humanly impossible to speak about the characters and acts of the creator. . . . [I]f God had wanted to make us metaphysicians, He would have given us a higher degree of insight."[39]

Crown Prince Friedrich was laying plans to bring Voltaire and Wolff to Berlin as twin pillars of a reinvigorated academy of sciences. Voltaire had no desire to live in Berlin. Nor did Wolff, who had put in his own time in purgatory at Marburg. Wolff wanted to be at a university, which Berlin did not have. So he returned to Halle in 1740. For Berlin, the newly crowned king had to settle for Maupertuis and Euler. With Maupertuis as president of the academy after 1746, a metaphysics of teleo-mechanics would blossom in Berlin.

The article by "O" on cosmology in Diderot's *Encylopédie* is interesting here.[40] O explained that cosmology considered the general laws of the cosmos, looking for the nexus in nature, leading to a view of the cosmic author. O reviewed Wolff's *Cosmologia generalis*, then moved to Maupertuis versus Wolff on the notion of action. Maupertuis's usage, O said, reconciled mechanical and final causes, of interest to those interested in the latter, which most French were not. O then mentioned Euler's papers of 1750–51 on "least action." From a Prussian view at midcentury, O did well in moving from Wolff to Maupertuis to Euler on cosmology. Thus the following discussion centers on cosmology in three subsections: "Atoms and Monads"; "Rational Mechanics"; "Stars, Aether, Aliens."

ATOMS AND MONADS

Wolff's triumphal return to Prussia in 1740 soon met with polemics from Berlin. A Wolffian work, *Belle Wolffiene*, by Formey, secretary of the academy, did appear in 1741. In the same year, the marquise du Châtelet's *Institutions physique* also appeared. The marquise saw herself as a Leibnizean and remarked of the great change in that philosophy introduced by Wolff, who nonetheless saw her *Institutions* as the best presentation of his own metaphysics. And 1741 saw as well a critique of Voltaire's Newtonian work and a defense of Leibnizean organicism and teleology by a certain Kahle.[41] But in the same year, Euler arrived in Berlin, and then in 1745 Maupertuis. Both were interested in metaphysics, but neither enamored of Wolffianism. Indeed, Euler replaced Lange as Wolff's chief tormentor after 1740 and went after the roots of Leibnizean-Wolffian metaphysics.

Though preestablished harmony seemed the root of most religious objec-

39. Friedrich II, *Die Philosophie*, 82, 64–65.

40. *Encylopédie* (1754), 4:294–97.

41. Du Châtelet, *Institutions physiques*, 137; Wolff, *Werke*, ser. 1,10:176; Kahle, *Vergleichung der . . . Metaphysik*.

tions to the Leibnizean-Wolffian philosophy, in second place came the monadology. J. F. Müller's anti Leibniz-Wolff tract of 1745, *Die ungegründete und Idealistische Monadologie* raised the essential physical objection: How could unextended simples, in however large numbers, affect an impenetrable or even extended body? How could metaphysical substances fill a physical space? In 1746, Euler published anonymously *Gedancken von den Elementen der Körper,* an anti-Wolffian work in a similar spirit. The work was immediately recognized as bearing his signature and occasioned swift critique by Formey.[42] An anonymous essay by C. A. Körber in 1746 also took up arms against Euler's essay. Körber argued that neither Leibniz nor Wolff anywhere maintained that monads made up physical bodies or could induce motion in them. "It seems that philosophical texts are little known to the *Herrn Gegner* [Euler] and that he has looked little in them." Also after Euler went a likewise anonymous essay in 1746 by Stiebritz, who presented a Wolffian monadology in which he denied monads representational powers.[43]

The controversy on monads erupted in 1746. Euler himself recollected:

> There was a time when the dispute about monads was so lively and general that one spoke of them heatedly in all companies, even in the *corps-de-garde.* There was almost not a single lady at court who had not declared herself for or against monads. Everyone's conversation fell upon monads everywhere and no one spoke of anything else. . . . The Berlin Royal Academy took much part in this dispute and, as its wont was to propose a prize question once per year . . . , it chose for the year 1748 the question on monads. A great number of entries were received on this matter. The president, Maupertuis, nominated a commission to examine them. . . . In the end, one found those wanting to establish the existence of monads were so weak and chimerical that they would overturn all the principles of knowledge. So one decided in favor of the opposite sentiment, and awarded the prize to a piece by Mr. Justi. . . . Your Highness can easily imagine that this move by the academy terribly irritated the partisans of monads, at the head of whom was the famous Mr. Wolff.[44]

The Berlin academy prize question for 1747–48 was on the monadology. The question quickly became so heated, the academy decided that, though the question had been posed by the philosophical class, all four classes of the academy would determine the winner.[45] That helped Euler to rig the decision, so that his "tool," Johann Justi, might win. Justi's essay was published, with

42. Formey, *Mélanges,* 1:263–453; Euler's *Gedancken* is in *Opera,* ser. 3, 2:351–66.

43. Körber, *Gegenseitige Prüfung,* 5; Stiebritz, *Widerlegung der Gedancken,* §§ 11–17: one may see rudiments here of the later Boscovich-Kant solution.

44. Euler, *Lettres,* vol. 2, letter 125; Harnack, *Geschichte der königlich Preussischen Akademie,* 1(1):403.

45. See Harnack, *Geschichte der königlich Preussischen Akademie,* 1(1):402–3; 2:305.

others, by the academy in 1748. A review in the *Göttingische Zeitungen von gelehrten Sachen* may be taken as a good barometer of opinion outside Prussia, as Göttingen was no friend of metaphysics or Wolff. The review noted Euler's authorship of the *Gedancken* of 1746 as common knowledge. It also noted the academy had taken pains to indicate that prize-winning essays did not perforce represent their views. The review went on, "We believe many readers will find here an apology by the academy for its choice, which did not come about with the consent of all members."[46]

In 1748, the academy published Justi's essay not once but twice, in French and German.[47] Justi's strategy was a *tertium non datur* between mathematics and physics: metaphysical issues were declared void of sense or made into mathematics or physics. Simples might exist in mathematics, but "in all of nature, one sees nothing of simples" (§ 23). One might allow Leibniz his notion of monads being possessed of perception as an internal power, but that gave no basis to explicate spatial extension and motion, as Wolff had tried to do (§§ 43, 50, 57, 89–90). If monads individually filled no space, how could a collection of them do so (§ 49)? "I cannot conceal the fact that I have seen nothing in the world so poorly tied together as the doctrine of monads" (§ 62).

Besides Justi's essay, the academy published seven other essays.[48] Save Justi's, only the last two in the 1748 collection were not anonymous. The last, by Ploucquet, did not address the question; but it allowed its author to be identified as that of the fourth essay, "Primaria monadologiae capita," which weighed pros and cons, including Euler's 1746 essay, then insisted one should separate metaphysical from mathematical matters (§ 163), and tilted toward the Leibnizean view—this was the essay that the review of 1748 in *Göttingische Zeitungen* said should have won the prize instead of Justi's. The second essay, "De Elementis," defended a Newtonian physical atomism (pt. 3, § 16). The third essay, "Systema mundi," defending Leibniz's monadology, was implicitly against Wolff's (chap. 4, § 67), but also explicated a theory of physical point atoms toward its close (chap. 5, § 104), which was Euler's view. The fifth, "Essai sur . . . les monades," was against monadology, as was the seventh, "Wiederlegung der . . . Monadologie," while the sixth, "Les monades," was for a reformed monadology, but against Wolff. Of all these essays, only two supported a monadology, and none was pro-Wolff.

In 1748, an independent essay by G. A. Müller on the prize question also attacked the Leibnizean view. Müller claimed it led to idealism and could not

46. *Göttingische Zeitungen von gelehrten Sachen* 121 (7 Nov. 1748), 966–68.

47. Parenthetical citations refer to Justi, "Untersuchung" and "Dissertation," identical by paragraph sections.

48. From Berlin Academy of Sciences, *Dissertation.* the essays are cited by paragraph sections here.

explicate extension or solidity and that, if not as mere mathematical points, monads made no sense. An anonymous, undated essay by A. Clavius, also probably from 1748, also used the prize question to attack Leibnizean views. Two other anonymous essays of 1748, however, supported Wolff and made the true statement that Justi did not understand metaphysics.[49] As 1748 promised a bumper crop of polemics, Justi managed to respond in the same year.

Justi defended the academy's decision and responded to some of his critics, including the last two above. He again essentially reduced metaphysical issues into mathematics or physics, and claimed the Leibnizean-Wolffian monadology was an erroneous translation of mathematical principles into physical ones. He also played the provinciality card, by noting that German metaphysics was viewed ill abroad, where one laughed about monads. About du Châtelet's support of monads, he said, "Women tend more than men to marvelous and mysterious teachings."[50] Misogyny aside, the remark is interesting in view of Euler's comment above. Translated from French, it reads: "There was a time when the dispute about monads was so lively and general that one spoke of them heatedly in all companies and even in the *corps-de-garde.*" The German version of the same work renders the last part of the sentence thus: "that it spread from the schools into women's salons *(Frauenzimmergesellschaften).*"[51] The French then goes on: "There was almost not a single lady at court who had not declared herself for or against monads." All this provides more grist for the view, not unknown to Leibniz scholars, that the monadology grew out of Leibniz's correspondence with women, and above all with the Hanoverians, whom he feared losing to Locke, worried as they were about the relation between their minds and bodies.

Properly peeved at Euler, Wolff wrote with a sigh to a friend in 1748:

> Scholars who love real learning are disappearing everywhere and a very superficial sort of knowledge gains the upper hand, as one has mixed a so-called Newtonian philosophy with the French world of flattery. . . . Mr. Euler, who may relish his well-deserved fame in higher mathematics, now wants to use his power to dominate all sciences, [even those] which he has never pursued. . . . Hereby he damages his own reputation much . . . , for which the controversy on monads instigated by him gives evidence, above all since he elected as his tool an arrogant and foolish and so impudent sophist *(Rabulisten),* named Justi, and thus for want of cleverness sacrificed the interests of the academy for his own passions. It is

49. Müller, *Unpartheyische Critik,* esp. 12, 20–24, 37–39; Clavius, *Bericht;* and the anonymous *Jeremaias W*** and *Sendschreiben an . . . Justi.*

50. Justi, *Nichtigkeit,* 39–42, quotation at 42.

51. Euler, *Briefe,* vol. 2, letter 125. No translator is listed.

> unfortunate that Mr. President Maupertuis is a Frenchman who neither speaks German nor understands the conditions of scholars in Germany and who, in things other than mathematics, possesses no more insight than Mr. Euler, although he is more clever and politer than Mr. Euler and would hold the latter more in check if he could only read German and knew enough about the conditions of scholars in Germany. It is sad when someone wants to build on one side by tearing down what others are building on the other side.[52]

Wolff rightly saw Euler as the puppet master pulling the strings behind the scenes in Berlin. Like Lange, Euler thought the Leibnizean-Wolffian view made the human body into a machine, removing the basis of morality. If humans were like marionettes, there seemed as little right to make moral judgments as one could about clocks not working. So Euler polemicized against the Leibnizean-Wolffian pneumato-cosmology and advanced a more Cartesian system, whereby the soul sensed via the body's nerves and used the body. If God as a spirit acted on matter, then why not human souls on matter?[53]

Euler was a traditional metaphysician. He held humans knew the real essence of matter: extension, inertia, and impenetrability. Inertia was grounded in the principle of sufficient reason, while impenetrability was the ultimate essence of matter. Euler did not accept a principle of action-reaction per se and rejected Newtonian gravitational attraction as violating inertia. Eulerian impenetrability replaced Newton's action at a distance, thus setting mechanical over physical forces. A typical two-front battle emerged, as Euler opposed himself to Newtonians and to Leibnizean-Wolffians. He said the Wolffian view of matter—the continuous inclination of each body to change its state—violated inertia and made elements into souls. Matter could not have representations, according to Euler, who, more than Wolff, wanted to drive a wedge between pneumatology and cosmology. Engaging in caricature, Euler claimed the monadist view held that physical division ultimately came upon indivisible but extended elements. His position was that matter was divisible indefinitely, without necessarily arriving at extended simples. Euler's "point atoms" moved from the mathematical to the physical by acquiring inertia.[54]

Preference for point atoms over monads shows what Euler liked most in Maupertuis's principle of least action, and it was not final causes. The principle of least action reduced analyses of motion to equilibrium states (like

52. Wolff, *Werke,* ser. 1, 16:142–43.

53. On the above, see Euler, *Lettres,* vol. 1, letters 60, 80–87.

54. Ibid., letter 26; vol. 2 letters 80, 85, 122-27, 132; Euler, *Opera,* ser. 2, 1:49–51; 3:20–21, 46; 5:152–98, 250–56; ser. 3, 2:347–72. Cf. Kästner, *Anfangsgründe der höhern Mechanik,* foreword, 3, 291. See Körner, "Der Begriff," 34–47.

d'Alembert's principle) and made a theory of matter, in regard to elasticity, irrelevant. Euler's rational mechanics depended on knowing matter a priori, without experiments. (That is why Euler could not like constants of nature, since they could only be determined experimentally.) While Justi, following Anglo-Franco sentiments, seemed set on reducing metaphysics to mathematics and physics, if not to nonsense, Euler remained a good metaphysician of the Cartesian cast.

RATIONAL MECHANICS

Euler set inertia as the foundational principle of mechanics, and derived force from impenetrability. He reduced all forces to the material via impenetrability and the psychic via spirit. No Newtonian attractive force existed; and what are now termed Newton's laws were neither ascribed to Newton by Euler nor accepted by him. Mentioned by "O," Euler's papers of 1750–51, as well as others, envisaged reduction of mechanics to analysis of equilibrium states. Not adhering to a Newtonian foundation of rational mechanics, Euler's principle for statics and mechanics gave three equations: $2Mddx = \pm Pdt^2$, $2Mddy = \pm Qdt^2$, $2Mddz = \pm Rdt^2$. Reducing this, he saw the foundation of mechanics as $dv = \mu pdt/A$ (or $dds/dt^2 = \mu p/A$, where μ is used as a proportionality constant, A as mass, v as velocity, p as *vis*). Euler claimed this as a necessary truth, giving him a rational mechanics metaphysically founded, the basis of his rational system of the world.[55]

In 1756–58, the absent president of the academy, Maupertuis, cast doubts on the necessity of the laws of mechanics, thus on the possibility of rational mechanics as a metaphysical science. He took "necessity" as meaning essentially mathematical necessity and argued that, given the conditions of experience or experiment, laws or principles of nature could not be necessary. The only seeming nonmathematical, metaphysical sense he would give "necessity" involved final causes or teleology, thus ultimately theology.[56] As with Wolffian rational theology in Halle, teleology emerged then in Berlin as central to the articulation of rational mechanics, or cosmology, as a metaphysical science.

Following on Maupertuis's essays, the Berlin academy prize question for 1758, repeated in 1759–60 as no one won, was: "Are the laws of statics and mechanics necessary or contingent?" No one won, and only seven entries survive in the academy's archive. In their nice variation and anonymity, these essays give a good barometer of the sense of such a metaphysical question then, in regard to rational mechanics. I refer to the essays by the last few digits of

55. Euler, *Lettres*, vol. 1, letters 19–24, 71-73, 77-79; vol. 2, letter 121; *Opera*, ser. 2, 3:66–67, 81–82; 5:90, 111, 118, 152–93; ser. 3, 1:18–51. See Hankins, "Reception of Newton's Second Law."

56. Maupertuis, "Examen philosophique," esp. 422–24.

their identifying archival numbers, 529 to 535. Written in Latin are 531, 533, 534, 535; in French, 529, 532; in German, 530.[57] Of the three great Berlin prize questions concerning metaphysics around midcentury, that on monads was the first, and this on the possibility of rational mechanics was the second.

Essay 529 sees dynamics as giving contingent laws, while phoronomics has necessary ones, since it abstracts from physical force and uses only point atoms. Essay 532 sees the laws of statics and mechanics as necessary, but not in all possible worlds. Maupertuis, according to 532, extended mechanics to include teleology; but 532 does not think the academy expects this profundity. Mechanics, for 532 following d'Alembert, is founded on pressures, not forces; and now following Euler, 532 sets the central formula of statics-mechanics as $pdt = dc$. Essay 535 sets as principles: inertia, action-reaction, $2mv = Pt$, and $2mdv = Pdt$, with P as *vis*. Analyzing the latter, 535 follows Euler's claims on necessity. Essay 534 does not answer the question, but rather transposes it, moving from analysis of mathematical to mechanical to physical points. Mathematical points in motion produce phoronomics, which has necessary laws; mass makes these into mechanical points. Necessary principles are those, such as inertia, that can be derived from the nature of such points without experience. The crucial step comes in moving to physical, extended points that bear the ideal mechanical ones, and the question is: In what sense are the laws of the latter true of the former, the knowledge of which depends on sensation? Essay 531 begins with a definition of "necessity," tying it to essences, then reducing that of body to extension, *realitas*, and inertia, using the latter contra Wolff to preclude self-alteration of states. Then 531 moves to statics founded on equilibrium, and claims its principles are necessary. Leibnizean *vis viva* is valid, but with such principles as least action, we leave rational mechanics or metaphysics, since such principles are not absolutely but only hypothetically necessary, as experience is involved. Essay 533 is more philosophical, convinced that the laws of mechanics, interpreted as relating to physical body, are not necessary: mechanical qua physical principles can be neither reduced to nor deduced from mathematics. 533 is puzzled that this metaphysical question has been posed by the mathematics section of the academy (which seems to be a mistake). This essay gives a history of positions on the laws of motion, much of which reduces to a discussion of monads and the Leibniz-Clarke debate; it rejects the monadists' active powers in body and argues that, seen physically, mechanics depends on the structure of matter, which cannot be shown to be necessary.

57. Berlin Brandenburgische Akademie der Wissenschaften, I-M529 to I-M535. Pre-1762, there is no way to tell whether the current holdings are complete or not. Essay 529 has a "No. 3" in different ink, perhaps by the academy; 531 has a "No. 7," likewise perhaps by the academy; 535 has a "D," probably by the academy. A better historian would have figured out who wrote these. The famous "O" was of course d'Alembert.

So we see a range of views from entries 529 to 535 for the Berlin academy's prize question for 1758 and 1759. The laws of mechanics did not seem to set Berlin abuzz that way that monads had. And, while resolution had largely risen against monads in Prussia, at least in view of the number of essays against them, that no one won this prize might indicate irresolution had set in about what was meant by "necessary," "rational," "mechanics," and above all by "metaphysics." Most saw no problems with statics. Mechanics was the problem and had come to have two parts: phoronomics and dynamics. Phoronomics was easily mastered by analytic geometry and statics; but dynamics involved collisions and so seemed to entail a theory of matter, about whose status everyone was now uncertain. Could there be a metaphysics of matter?

Before the 1750s, wishing a rational mechanics preserving conservation of *vis viva* and continuity in collisions, Leibnizeans had posited matter as elastic. Wolff and Euler were united in adhering to the idea of continuity, which meant opposition to Newton. Newtonians were happy to do away with continuity, conservation, and *vis viva*. Euler's option offered point atoms and principles, above all least action, saving continuity and making the structure of matter irrelevant. By the 1760s, monads might no longer have been in fashion, but Euler's point atoms, good for phoronomics, did not seem enough for dynamics. Metaphysicians disputed with mathematicians, philosophers with physicists. The result would be a "phenomenological" and even positivistic solution by physicists.

In and after the 1760s, the two most widely used mathematics-mechanics textbooks in the Germanies were by Kästner, professor in Göttingen, and by Karsten, professor in Rostock, and later in Halle. Karsten said that although we have no experience of perfectly hard bodies, he would not rule them out a priori via appeal to continuity as a metaphysical principle. Rules of collision must consider inelastic and elastic bodies. Kästner in fact posited inelastic bodies, rejected a principle of continuity for collisions, and saw the point of the principle of least action to lie in its application to elastic and inelastic bodies.[58] Kästner and Karsten, prey to a now fashionable Newtonianism, were closer to Maupertuis's view than to Euler's: What we know of matter is grounded empirically in phenomena. Principles of mechanics are judged positivistically by the results obtained, not by intrinsic warrant. This view made rational mechanics, as a metaphysical science, essentially impossible.

Let us return to the erstwhile president of the academy whose essays in the 1750s had provoked the second great Berlin prize question on metaphysics and

58. Karsten, *Lehrbegriff*, vol. 4, §§ 228–46, 266–73; Kästner, *Anfangsgründe der höhern Mechanik*, 293–94, 351–85.

helped pave the way for the acceptance of Newtonianism. As we have seen, Maupertuis only found necessity in physics insofar as teleology and final causes were at work. What remained of metaphysical science was but cosmo-theology: Maupertius's principle of least action was a proof of God's existence, though he sometimes also argued the opposite, deriving cosmological principles from theology.[59] In any case, Maupertuis's least action promised to make teleology more than a handmaiden of mechanics. As Berlin was a purgatory of controversies in the mid-eighteenth century, a dispute about least action emerged. In the controversy, debate revolved around not only who—Wolff or Maupertuis—had coined the relevant sense of "action," but also around how to measure "action." However one measured it, Maupertuis's principle held that, in transmission of light and in collision of bodies, nature always worked to minimize action.

Euler's papers of 1750–51 gave the controversy its decisive turn: the principle of least action became one of maxima and minima for a path or a system of bodies. Euler approximated paths or states of a system by taking initial and final positions.[60] The teleological moment switched from economics (minima) to systematics (paths and states), returning to the Leibnizean view that mechanics, as a study of efficient causes, could not explain the possibility of the cosmos as a structure or system, seen by Leibnizeans as involving final causes. The principle of least action, as a principle of system, showed how to see the mind in the machine without the miraculous: teleology.

That makes Maupertuis's view of physico-theology interesting: He made fun of it. He thought it degrading to deal in a theology of details. Instead, he would have one pursue cosmo-theology, the only part of metaphysics scientifically feasible. Reimarus produced two popular works in physico-theology and asked, What are details? He said that Maupertuis misunderstood the point.[61] Physico-theology meant that one saw the garden as a metaphysical matter where no detail was too small to reflect God. But at midcentury in Berlin, while the central status of teleology was maintained, metaphysics seemed to be collapsing at the president's hands, despite Euler, to its great center in cosmo-theology.

To illuminate the tie of teleology and cosmology, let us look at someone who longed to be in the purgatory of controversies that most sought to leave. Johann Lambert arrived in Berlin to stay in 1764, becoming a member of the

59. Maupertuis, *Essai*, 9, 18, 39, 75; *Oeuvres*, 4:21.

60. See Calinger, "Newtonian-Wolffian Confrontation"; Polonoff, *Force*; Pulte, *Das Prinzip*; Terrall, "Culture of Science." The papers are in Euler, *Opera*, ser. 2, vol. 5.

61. Reimarus, *Abhandlung*, 208–43, esp. 222; Maupertuis, *Essai*, 9, 18, 39, 75; *Oeuvres*, 4:21; "Examen philosophique."

academy in 1765, a year before Euler left. Lambert saw a problem with all constructions of matter, since science rested on sensation and it was possible there were matters we could not sense. Dynamics was contingent on instrumental verification, thus it was "phenomenological," a word he coined. Mechanics concerned only the world as phenomenon, making experiment and measurement essential to knowledge of nature.[62] Lambert's positivism on rational mechanics seems to have gone beyond that of even Kästner and Karsten in the 1760s.

But, being in Berlin, Lambert argued for what was implicit in Euler's construal of Maupertuis's cosmo-theology: as opposed to mechanics founded only on efficient causes, cosmology emerged by the introduction of teleology, or final causes, grounding the possibility of a system.[63] Lambert took the Newtonian as opposed to Leibnizean solution to the system: gravity, rather than monads, was the systematic moment in the cosmos. Nonetheless, a would-be servant to the Prussian crown, Lambert held that teleology helped establish the structural aspect of natural laws and aided in their discovery. Like mechanics, teleology was a constructive part of natural philosophy and underlay the possibility of a system of the world. The "nature" of Prussia remained teleo-mechanical.

Stars, Aether, Aliens

We have first considered atoms and monads as the ultimately small: the microcosm. Then we have considered whether laws or principles, as rational mechanics, founded a metaphysical science of nature: the system. We now complete the metaphysical dimensions of the cosmos by considering the ultimately large or distant: the macrocosm. As dogmatic metaphysicians, Leibniz and Wolff held no other worlds existed, since ours was the best possible.[64] The notion of possible worlds, in a sense other than spatially distant, remained too metaphysical for most. More typical were considerations about the extent of the cosmos, what filled it, the possible number of stars, and whether they or their planets were inhabited.

Director of the Berlin observatory and member of the academy, Johann Bode held space to be probably infinite, with the cosmos as finite and God beyond it. Whether or not such assertions in modern cosmology are grounded in anything other than metaphysics, they were not in the eighteenth century.[65]

62. Lambert, *Schriften*, 1:462–63, 48–92; cf. Kästner, *Anfangsgründe der höhern Mechanik*, foreword; Karsten, *Lehrbegriff der gesammten Mathematik*, vol. 4, foreword.

63. Lambert, *Briefe*, viii–ix, xxi, 61, 80. See Biermann, "Lambert und die berliner Akademie."

64. Leibniz, *Schriften*, 6:107, 210; Wolff, *Werke*, ser. 1, 6: § 80; 8: § 37; ser. 2, 2:319–26, 332; 7: 133–34, 328, 358, 401–2, 780–82.

65. Bode, *Betrachtungen*, 185–87; cf. *Anleitung*, 669. See Alfvèn, "Cosmology."

The post-Cartesian cosmos had become, at the least, indefinite. For many in the enlightened Germanies, the indefinite cosmic space was filled by aether, the cosmic mediator between advocates of gravity and fans of monads. Aether theory, like physico-theology, served as a linkage point between theology, pneumatology, and cosmology. Aether instantiated the system of the world.

Euler was the great aether theorist in the Germanies. Posit of an enlightened aether there typically followed in his footsteps, even if not taking his aim of doing away with Newtonian action at a distance and Leibnizean monads. Whether following Euler or not, German aether theorists usually used aether as a space-filling entity, often the bearer of light and sometimes of gravity. Aether worked by mechanical principles, so was of no relevance to a new sort of doctrine of astral influx. By midcentury, monads, as the principle of system, found little favor, as pneumatology and cosmology had been cloven by aether.[66]

The Enlightenment mechanized and disenchanted the cosmos. In the post-astrological, clockwork cosmos, there could be no necessity in a particular number of planets, and in any case, the magic number of seven had not survived the seventeenth century. Planets beyond Saturn in our solar system had been mooted by the 1750s, so construction of "Uranus" in the early 1780s proceeded with ease. Debate quickly revolved around the cometary versus planetary status of the newly observed body. After Herschel's first glimpse in March 1781, a number of astronomers, including Bode in Berlin, had advanced a planetary view by September, though by early 1782 it had not been generally endorsed. Kästner in Göttingen, for example, initially proceeded cautiously in discussing the matter.[67]

Interesting for enlightened cosmology was the naming of the new planet. Though some wanted to give it such silly names as George (after the king of England), Bode claimed to be the one to have suggested the name "Uranus," the mythical father of Saturn.[68] Bode also suggested a symbol for the new planet developed along the lines of traditional astrological symbols (see fig. 13.2). Mindful of the concurrent changes in chemistry in regard to the tradition of naming, cosmology seems to have become at ease with its mythical roots, insofar as aware of them. That the first new planet in millennia could be so quickly recognized, then given the name "Uranus," with a symbol from the astrological tradition, shows how dead astrology really was. Cosmology had achieved control of its mystical, metaphysical past.

Prussian *Aufklärung* made aether and stars less spooky, naturalizing,

66. See Euler, *Opera*, ser. 3, 1:3–15, 112ff., 134ff., 149ff.; *Lettres*, vol. 1, letters 17 and following, letters 54 and following. On German aethers, cf. Clark, "German Physics Textbooks"; Wise, "German Concepts of Force"; on astrology, see Clark, "Der Untergang der Astrologie."

67. Kästner, *Anfangsgründe der Astronomie*, 168–72; also Wurm, *Geschichte*, 9–17.

68. Bode, *Von den neu entdekten Planeten*, 87–95.

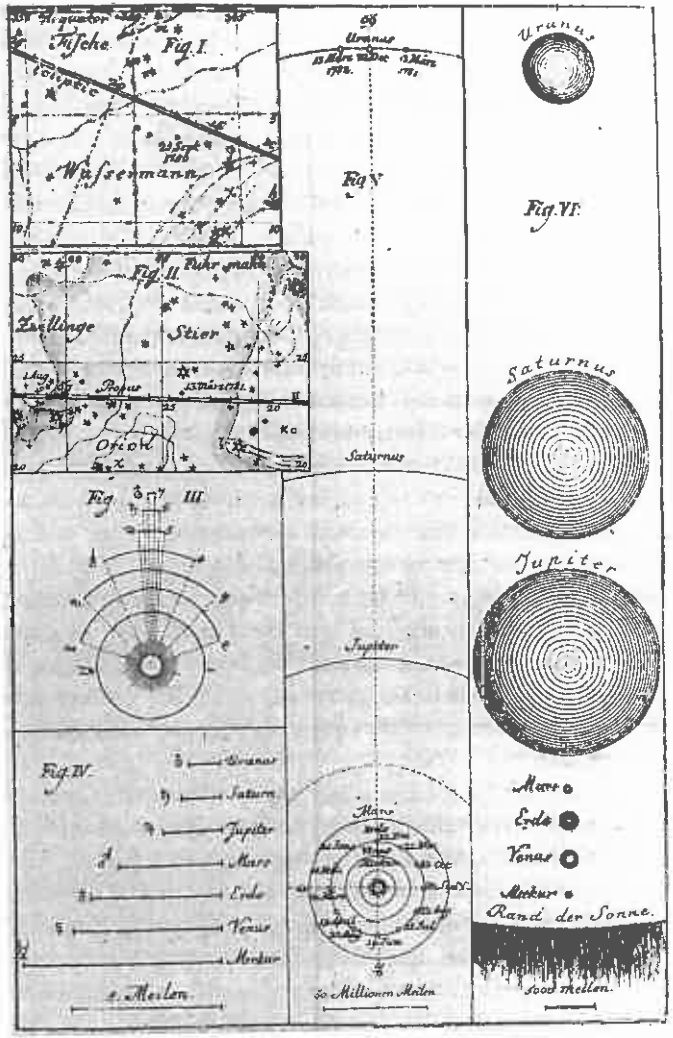

Fig. 13.2. Illustration of the integration of Uranus into the known solar system from Johann Elert von Bode's *Von den neu endeckten Planten* (1784). By permission of the Universitätsbibliothek Göttingen.

mechanizing, dispiriting, disenchanting them. How oddly other, then, the views about aliens. While belief in extraterrestrial life still seems exceptional in the Baroque, it becomes the rule among intellectuals in the *Aufklärung*.[69] It is almost as if the mental energy once devoted to the pneumato-cosmology of judicial astrology moves to a "cosmo-anthropology." And like its cousin, physico-theology, cosmo-anthropology becomes part of popular science.

Near midcentury, one might write poems about aliens or speculate of them in works on comets.[70] In a popular work, later made more academic, Kindermann formulates a cosmic anthropology. His Venutians are not lazier than "Indians," as he relates, but owing to the heat, rather more spiritual than corporeal. They know no Fall, as Earthlings had; they speak Hebrew and have no sects. Mercurians have even better minds and senses than Venutians, and their bodies are nearly wholly fluid, though because of their very short diurnal cycle they probably do not study astronomy. Mercurians live in forests with huge trees for shade; indeed, they live in trees. If you object that only savages live in forests, and never civilized peoples, Kindermann refers you to Adam and his kin: Where did they live? On Mars things are bad: They don't study astronomy. They swear and curse and so probably have a lot of lawyers. Martians fight too much. Think of those who live in cold climes, such as Russians and Swedes, as opposed to Indians. The former fight a lot, so it makes sense that Martians do too. The other planets get peoples, but comets do not, since they are erstwhile planets that have experienced a Last Judgment and lost their souls.[71]

An equally famous cosmo-anthropology comes from Krüger. His Mercurians are black and think differently than "we" do. They are superstitious and foolish. It's a madhouse. Venutians are more educated. Since the heat is less, they are more human in form and less mad than Mercurians. There is no grass on Venus, but wine-producing plants exist and no one needs to work. But Venus has a dark side. Lunarians are bad philosophers. They think teleologically. Witches and magicians abound. Martians inhabit cities on big cliffs. Everyone is mean. Men brandish swords and drink blood. Kids are naked and villages are freqently burned. But Jovians are cool. They live on air and water, and no one ever gets sick. Some live to be a thousand years old. And Jovians

69. Dick, Plurality of Worlds; Guthke, *Der Mythos der Neuzeit*. See Wolff, *Werke*, ser. 1, 7: § 30; Leibniz, *Schriften*, 6:114; also Fontenelle, *Dialogen über die Mehrheit der Welten*, with commentary by Bode.

70. As in Mylius, "Lehrgedicht von den . . . Cometen"; J.M.R., *Gedancken*, 20; the anonymous *Sendschreiben an einen Freund*, 11, and *Curioses Gesprach*, 21–22; also Heyn, *Versuch einer Betrachtung über die Cometen*, 19–25.

71. Kindermann, *Reise in Gedancken*, 50–55, 61–65, 70–74, 82, 84, 206.

like science. Saturnians live in caves since it's so cold. Stars have inhabited planets, about which we know little. . . .[72]

Such views were not restricted to popularizers. In an otherwise technical work, the later professor and member of the Berlin Academy of Sciences, Ernst Fischer, explained that the inhabitants of Uranus and Saturn get little light, so their senses must be better than ours. Saturnians have more time to penetrate the secrets of nature and may therefore have reached a higher state than we; but Mercurians must be several steps lower than we, and have a shorter life, with little time to study nature, and coarser senses needing much stimulation. And cometary inhabitants must be more noble than planetary dwellers. The most important Prussian astronomer, Bode, thought planets were inhabited and probably comets as well. Even the sun might be populated, and other solar systems too. Bode held thinking beings would be better the further from the center of the galaxy, since the rotation was less.[73]

The midcentury *Aufklärung* coveted cosmic disenchantment, contemplating the death of metaphysics or collapsing it to cosmo-theology, if not to cosmo-anthropology. Cosmology was freed of astrology and pneumatology: Beyond the aspect of system as the mind in the machine, the cosmos was rid of the deus ex machina and atoms rid of souls. But in banning monads, miracles, and fate, the Prussian *Aufklärung* held firm to teleology. The enlightened Lambert spoke well when he said all parts of the cosmos must have life by a teleological principle of plenitude. "I agree with you entirely that those who doubt or even deny the existence of inhabitants of other planets have been left far behind and are so very restricted in their understanding. . . . Most know only a few villages, their birthplace."[74] Enlightened Prussians were cosmopolitans. Cosmo-anthropology and physico-theology were the twin progeny of popular metaphysics as teleology. Aliens ruled. "Philosophical anthropology has become cosmology and cosmology philosophical anthropology."[75]

Kant and the Heavenly City

"Kant was not destined for easy victories and perhaps it was just as well that his academic aspirations were not fulfilled at the time [the 1750s and 1760s], and that he remained the stout-hearted provincial in Königsberg rather than a fallen Icarus in Berlin."[76] A year before Wolff died in 1754, Maupertuis

72. Krüger, *Träume*, 97–120.

73. Fischer, *Betrachtung über de Kometen*, 4–6, 15–16; Bode, *Anleitung*, 642–47, 662–66; and *Betrachtungen*, 105–18, 166, 174–75.

74. Lambert, *Briefe*, 106, also x, 62–68, 80.

75. Guthke, *Der Mythos*, 236.

76. Polonoff, *Force*, 123.

absented himself from Berlin and died himself in 1759. Euler left Berlin in 1766 and returned to the Academy of Sciences in St. Petersburg, another brainchild of Leibniz. In 1764, the year Lambert arrived in Berlin, the University of Königsberg and the ministry in Berlin, embarrassed that the "world famous" Immanuel Kant was still but a lecturer, offered him the vacant professorship in eloquence and poetry. Though such an offer might seem strange to us, it was a typical early modern practice in the Germanies, where professorships were still treated essentially as sinecures, and where subjects in the faculty of arts and sciences were still effectively treated as a unified corpus.

Lecturer Kant, however, showing modern sentiments, turned the offer down. He wanted the professorship of logic and metaphysics, for the latter was his great love in life, to which he intended to be true. Kant likewise remained true to Königsberg. When Wolff was driven from Halle in 1723, J. J. Lange replaced him as professor of mathematics and philosophy. Between 1763 and 1765, given the junior Lange's advanced age, then death, the ministry in Berlin went so far as to appoint Kant to Halle in 1763–65, in effect, giving him Wolff's first chair. But Lecturer Kant did not go to Halle, even though, like Semler, he had grown up in the traditions of Wolffianism and Pietism. Indeed, for most of his career, Kant used the textbook of a Wolffian from Halle, Baumgarten's *Metaphysica*, which begins: "§ 1. Metaphysics is the science of the first principles of human cognition. § 2. . . . To metaphysics are referred ontology, cosmology, psychology and natural theology." Kant stayed in peripheral Königsberg, became professor of logic and metaphysics in 1770, and tried to rescue but ended up terrorizing his great love in life.

In the provinces, Kant mulled over problems, such as monads and fate, left as passé by the academicians in the capitals. After his "critical" and "transcendental" turn of 1781—these being Kant's terms of art to distinguish his metaphysics from the "dogmatic" and "transcendent" of Leibniz, Wolff, and Euler—Kant's path put him at odds with the phenomenological and positivistic turn emerging among the new physicists: Kästner, Karsten, and Lambert. This final section, on the Kantian attempt to rescue and reform metaphysics, has three subsections: "Cosmology," "Theology," and "Anthropology."

COSMOLOGY

In his first work (1747), Kant declared himself a Leibnizean by adhering to a principle of continuity to resolve the *vis viva* controversy, then passé.[77] In *Monadologia physica* of 1756, on an issue also passé, he adopted Eulerian point atoms, with some big wrinkles: Kant transmuted monads into a "dialectic of

77. Kant, *Schriften*, 1:21–28, 37, 181.

powers." His physical monads filled space by a sphere of repulsive power, whence Eulerian impenetrability was derived. But if bodies were to have a finite volume, instead of self-repelling themselves to infinity, attractive power must complement repulsive. Kant posited Newtonian attraction for that necessary opposition. This theory of conflicting powers preserved the Leibnizean emphasis on monads as active principles, and accommodated the Wolffian notion that monads had a motive power tending to move them in all directions at once, appearing now as a tendency to fill space by self-repulsion, which, thanks to attraction, gave bodies a finite volume. From the dialectic of powers, perfect elasticity followed, since in collisions the spheres of equilibrated powers would be compressed until the repulsive forces of the monads overcame the compressing force. Moreover, one might hold that Eulerian point atoms never touched in collisions, since the repulsive sphere prohibited that by rising asymptotically as distance went to zero. The theory thus preserved continuity and allowed conservation of *vis viva* (mv^2).[78]

After the first critique, *Kritik der reinen Vernunft* (1781), Kant took the question of the divisibility to and composition from atoms or monads to be the "second antinomy" of dogmatic metaphysics: a dilemma that neither pro nor contra could resolve. His critical metaphysics, in place of the dogmatic, held one could not decide the question of whether atoms or monads in the strict sense existed. In *Metaphysische Anfangsgründe* of 1786, however, Kant attempted a critical metaphysics of matter. Here he did not advance much in dynamics over the essay of 1756, as a letter of 1792 shows he knew. The difference in 1786 was the transcendental turn grounding the construction of matter on his critically metaphysical or transcendental principle of "the possibility of experience." Abandoning the approach of the 1756 work as dogmatically metaphysical, Kant in effect took the view of the new physicists—Kästner, Karsten, Lambert—and asked: What are the necessary conditions underlying the possibility of sensing matter? Kant's physical monadology of 1756, insofar as it survived in the work of 1786, traded Leibnizean monadology for the dialectic of powers, which was now taken as the answer to Kant's new transcendental question.

"Give me matter alone and I shall build you a world," said Kant, moving from the microcosm in his first work (1747) to the macrocosm in his second work (1755), where he set a mechanistic cosmogony in place of Moses' creation story. Did this remove the basis of physico-theology? The philosopher of Königsberg was obscure here. Kant did people the planets in his 1755 work. As opposed to Kindermann's, Kant's aliens, like Fischer's, improved the further

78. Ibid., 473–87; cf. Boscovich, *Philosophia naturalis*.

they got from the center of the solar system. But he also stressed the need to keep theology out of natural science, so the cosmos was allowed to work mechanically, at least macroscopically. In 1755, Kant exposited not only a solar system mechanically born and working, but also a system of solar systems wrapped up in systems, perhaps in systems of systems. . . . It seems that a misunderstanding of Thomas Wright's work on the Milky Way gave him the impetus for his theory. By the principle of continuity, Kant argued not only for higher-order systems, or galaxies, above solar systems, but also for the less dramatic but important point that other planets probably existed beyond Saturn.[79]

Kant extended the systematic unity of the cosmos not only in space but also in time. "Creation is never at end. It had once a beginning, but will never end." Centers expanded creation outward, while themselves later ultimately collapsing. "The developed world finds itself limited between the ruins of the destroyed and the chaos of undeveloped Nature." The theory of 1755 spoke only of a cosmos without bounds, while that of 1747 had seen multiple worlds in other dimensions as at least metaphysically possible, though not likely.[80] The critical Kant, however, would come to see the question of the extent of the cosmos in space-time to be the "first antinomy" of dogmatic metaphysics: another dilemma that neither pro nor con could resolve. Critical metaphysics held that "of the cosmos as a whole we can say nothing." The vogue of cosmo-anthropology would also become suspect. The tendency of Kant's thinking was to exorcize spirits from matter, to separate pneumatology and cosmology. He followed Euler in seeing matter as necessarily dispirited: "All natural science rests on the proposition: matter has no representations." As it seems to have been Wolff's fate to be defamed, Kant claimed that it was Wolff who reduced power to the power of perception or representation, leading to Spinozism![81]

About the aether, Kant might have had other tendencies. In *Kritik der reinen Vernunft,* he argued that the "principle of the possibility of experience"—his critical, transcendental substitute for Leibniz's dogmatic and transcendent principle of sufficient reason—entailed the necessity of a causal order in nature, amounting to a more or less mechanical one. Kant's *Metaphysische Anfangsgründe der Naturwissenschaften* of 1786 fleshed out the metaphysical foundations of this mechanical order, with Leibnizean organics replaced by a dynamics or dialectic of powers, discussed above, which explicated the

79. Kant, *Schriften,* 1:222–23, 229 (quotation), 230, 247–58, 333–34, 351–66; see Schaffer, "Phoenix of Nature."

80. Kant, *Schriften,* 1:22–25, 256–57, 308–22; quotations at 314, 319.

81. Ibid., 3:294–303, 340, 354–62, 355 (first quotation); 4:476–78, 499, 508, 523–25, 554–55; 11:376–77, 395–96; 28(1):441, 449 (second), 511–12.

possibility of sensing matter. In his unpublished work *(Opus postumum)*, he envisaged the final step as a metaphysics of experimental physics. In this work, in which Kästner and Karsten were criticized, Kant wanted to supply the missing transcendental basis to the positivistic experimental physics. The *Opus postumum* used the aether as a psychophysical posit, and in essence articulated the dialectic of subject-object in experimentation.

This was to be part of the new metaphysics he envisaged. We have seen that, for the critical Kant of the transcendental turn, attempts to decide both the extent of the cosmos in space-time and the divisibility to and composition from atoms or monads constituted the first and second antinomies of dogmatic metaphysics. On these two great cosmological issues—the microcosm and macrocosm—he now denied metaphysical science knowledge. The mechanical constitution of the cosmos—the system of the world—and its ramifications for the question of fate versus freedom constituted the "third antinomy" of dogmatic metaphysics for him: a third dilemma that neither pro nor contra could resolve.[82] Around this antinomy, the first Leibnizean labyrinth of reason, revolved theology, cosmology, and pneumatology. In the case of this third dilemma of metaphysics, however, he argued that both pro and con were correct, but of different spheres or worlds. Mechanics treated of the sensible, phenomenal world, and morals of the intelligible, noumenal world. Having served as the theme of his inaugural dissertation of 1770, these two kingdoms or worlds, which Leibniz had sought to unite in his teleo-mechanics, were now cast asunder. And instead of being the handmaiden of theology in answering the great cosmic questions of life, metaphysics seemed now rather more stuck in the phenomenal world, as a servant of positive science, establishing the possibility of rational knowledge through experimentation. But Kant made a most interesting remark in the late work of 1786: "An absolute vacuum and absolute hardness are in natural science what blind chance and blind fate are in metaphysical science."[83] Even critical metaphysics could rest assured pietistically that neither fate nor fortune existed when blind.

THEOLOGY

There had been other critiques of Wolff's rational theology and the tradition it inspired. But Kant's critique spelled its death knell philosophically and historically. His critique of rational theology appeared in a work of 1763 and then in the *Kritik der reinen Vernunft* (2d ed., 1787).[84] In these works, he inaugurated a modern style of metaproof: to prove that the existence of a thing, in this case

82. Ibid., 3:308–13, 362–77.
83. Ibid., 4:532.
84. Ibid., 2:63–164; 3:314–21, 378–81, 392–426.

God, could not be proven. The style of reasoning was different from skepticism as well as from arguments by reductio ad absurdam.

Kant separated critical from dogmatic metaphysics, and both from mathematics. Critical metaphysics set limits to reason, and its positive results came only by the principle of the possibility of experience, as the basis of a new transcendental logic. Unlike formal and transcendental logic, mathematics engaged in proofs of existence, contained "synthetic a priori" truths. Mathematics, Kant held, contained such truths since it had access to a priori "intuitions" or apprehensions of space and time. Unlike mathematical truths, a "direct synthetic [existential] proposition from concepts [alone] is a *Dogma*." A metaphysical dogmatics of reason was to be replaced with a critique of it. As we have seen, Kant argued that rational theology reduced to onto-theology, cosmo-theology, and physico-theology. Following Leibniz and Baumgarten, he argued that cosmo-theology and onto-theology were interrelated and his strategy was to expose a vicious circle.[85]

The ontological proof claimed that the existence of an absolutely supreme being followed from articulated conception alone. Kant cut the Gordian knot by arguing that "existence" was not a predicate, so that existential or "synthetic" propositions depended on data—pure intuitions or sensible experience—beyond the analysis of concepts. Insofar as mathematics could not offer a base, onto-theology must depend on cosmo-theology for its a priori data. So Kant turned to cosmo-theology, which argued from the contingency of intramundane beings and relations, as its sole datum, to the absolute necessity of an extramundane deity. Kant argued that there was no way to move from the cosmos, as a series of contingent beings and relations to anything outside that series. He called this the "fourth antinomy" of dogmatic metaphysics, which completed the list and formed a bridge to cosmology per se.[86] And should one concede the existence of an extramundane being, there was no way to establish whether this was the deity of revelation, as opposed to a world soul or one deity among many, unless cosmo-theology appealed circularly and viciously to the absolutely supreme being of onto-theology.

Kant thought he had established a vicious circle between onto- and cosmo-theology, as well as unveiling the dogmatic presuppositions of each. So he saw no consequence in Maupertuis's theological application of the principle of least action, which Kant saw as an overly abstract physico-theology or an overly detailed cosmo-theology.[87] If taken as the latter, then it fell under the fourth antinomy of dogmatic metaphysics; if taken as the former, it would

85. Ibid., 3:482; see Henrich, *Der ontologische Gottesbeweis*, 45, 65–66, 137.
86. Kant, *Schriften*, 3:314–21, 378–81.
87. Ibid., 2:116–37; 3:413–20; 5:436–42.

stand or fall with physico-theology. And physico-theology, as we have seen, remained central to enlightened Prussian metaphysics and would remain so for Kant, though no longer as a constructive part of science. While Wolff saw physico-theology, qua teleology, as an experimental theology or metaphysics, for Kant it would become part of a critical metaphysics of experiment and observation. As part of dogmatic metaphysics, however, physico-theology could never prove anything about any deity, Kant argued, since its evidential force fell with cosmo-theology. Moreover, he took issue with the basic presumption underlying physico- and cosmo-theology: That order might not arise from mechanical causes. His *Allgemeine Naturgeschichte* of 1755 set out to argue that the cosmic order could have arisen from mechanical causes alone. While culminating the Leibnizean-Wolffian project to remove the miraculous divine hand even from creation, the young Kant expressed Pietistic admiration nonetheless for the spirit of physico-theology.

Perhaps having lost his Pietistic faith, in his later years Kant advanced against revealed theology. We have discussed above the appearance of Neologism, fusing Pietism with Wolffian rationalism, and trying to undercut Deism by naturalizing particular miracles. Kant tried for a time to make way for Lange along with Wolff. In arguing in the first edition of *Kritik der reinen Vernunft* that reason could not prove the existence of a deity, he was in effect arguing the Pietists' case contra Wolff; moreover, as Kant noted in the preface to the second edition, he had shown reason its limits in order better to secure the rights of faith. But by the 1790s, reason got in the way of faith, and Kant seemed to be heading to a radically Neological position, denying the possibility of the miracle of revelation. He claimed that governments and churches liked ancient miracles, but not modern ones. Churches were sectarian, since they depended on revelation, always particular and miraculous. "One can say with reason that 'the Kingdom of God has arrived to us' only when the principle of a gradual transition from belief in Churches to a general religion of Reason, and thus to a (divine) ethical state on earth, obtains general and also *public* roots somewhere." The rationality of claims to revelation could never be admitted. "For if God would really speak to a human, the latter could never know that it was God who spoke."[88]

Belief that the deity spoke at a certain time to a certain people was opposed by Kantian *Aufklärung*, bent to remove the miraculous, as dogmatically metaphysical, from history. If not even a revealed theology remained possible, did any? The Cartesian instauration of modern metaphysics had depended on the possibility of rational theology, especially onto-theology. The German tradition

88. Ibid., 6:83–89, 102–115, 122 (first quotation); 7:63 (second).

of Leibniz and Wolff set cosmo-theology alongside onto-theology as jewels in the crown of metaphysics, queen of the sciences and handmaiden of revealed theology. Wolff and the *Aufklärung* added physico-theology, as the final jewel in the trinity of rational theology, the loftiest human science. In the course of the eighteenth century, a cosmo-anthropology had emerged too, which with physico-theology formed a sort of popular metaphysics. If, save Euler, the climate of opinion in enlightened Berlin by midcentury was casting dark clouds over the field of academic metaphysics, at least cosmo-theology seemed safe, given shelter by Maupertuis. Allowing physico-theology and cosmo-anthropology as enlightened and pious but essentially nonscientific pastimes, Kant's attack on cosmo-theology seems then the crux of his attack on transcendent metaphysics—and one might wonder whether that was essentially his attack on the principle of sufficient reason as dogmatic metaphysics.[89] With the transcendent labeled "illusion," was the science of metaphysics now but the charwoman of physical science?

ANTHROPOLOGY

> The field of philosophy . . . may be reduced to four questions: (1) What can I know? (2) What should I do? (3) What dare I hope? (4) What is human *(Was ist der Mensch)?* Metaphysics answers the first question, morals the second, religion the third, and anthropology the fourth. But one could really take all of these as anthropology, since the first three questions relate to the fourth.[90]

A Prussian view of the Enlightenment: Kant saved metaphysics by making it anthropology?

Nature and Freedom

Kant's first critique, *Kritik der reinen Vernunft*, turned general metaphysics as ontology into a "transcendental logic" and, specifically, into a "transcendental analytics," followed by a "transcendental dialectics" on special metaphysics. The first part of the critique concerned the question, What is an object? Kant transformed that question into a new one: What is the objective structure of the world? He argued from his new transcendental, critical principle of the possibility of experience: if (intersubjective) experience of a world is to be at

89. Leibniz, for example, begins with the cosmo-theological proof in *Monadologie* and moves toward the onto-theological; his argument depends on the principle of sufficient reason, and he claims that without this principle "we would never be able to prove God's existence" (*Théodicée*, § 44); see Leibniz, *Schriften*, 6:127, 612–14. From the Middle Ages up to the Enlightenment, cosmo-theology seems the clear favorite for academics.

90. Kant, *Schriften*, 9:25.

all possible, what are the conditions on the structure of the world? The medieval concern with possible worlds, revived by Leibniz, became with Kant a concern with the conditions underlying the possibility of the experience of a world, taken as its objective structure, that is, nature. Probably formulated in view of of Pietist fears of fatalism, as noted, Wolff's world-as-perceived had already moved toward phenomenalism. An Anglo-American tradition tends to see this as a turn from ontology to espistemology, while a Continental tradition speaks rather of a turn to philosophical anthropology: the metaphysics of nature rests on a metaphysics of human (inter)subjectivity.[91]

The second critique, *Kritik der praktischen Vernunft,* answers the question, What is a person? The condition of the possibility for recognizing a person is Kant's "categorical imperative": A person is an entity that is an end-in-itself, never a means. The second critique aims also to establish the actuality of freedom, given the necessary nexus of the cosmos as a seemingly fatalistic mechanical order. As always in enlightened Prussia, it involves the reconciliation of Lange and Wolff. The third antinomy in the first critique set the stage for this reconciliation. Indeed, the Leibnizean kingdoms of nature and grace, the worlds of the sensible and the intelligible, are what Kant reformulates in his first and second critiques. The second critique defines the "person" as that which inhabits an intelligible world beyond the sensible and so partakes of the kingdom of grace, called a sphere of freedom as duty by Kant, a Prussian professorial civil servant. In this critique and in subsequent works on morals, he articulates a moral philosophy, perhaps the first, that applies to all rational beings. All such beings must be seen as persons. The moral philosophy or theory of the person following from this and its implications also includes angels and aliens, automata and apes, insofar as the latter could become rational. If there is a heavenly city in the Enlightenment, it is Kant's universal kingdom of rational (free) beings.

Kant envisaged two metaphysical sciences: a science of nature and a science of freedom, that is, of objects and persons—but not of humans. The first critique prepared a metaphysical science of nature, set out in *Metaphysische Anfangsgründe der Naturwissenschaften* and *Opus postumum.* The second critique prepared a metaphysical science of persons, set out in *Grundlegung zur*

91. As cited above, see Wolff, *Werke,* ser. 2, 4:45, 173, 224–25. The argument about Kant's transformation of metaphysics into anthropology has been well known since Heidegger and more recently through Foucault's work: see Heidegger, *Kant,* esp. §§ 36–38 (*Holzwege,* 73–110, esp. 89–91, 96–98, makes this turn Cartesian); Foucault, *Les mots et les choses,* 351–54. Foucault's view of Kant was long essentially Heidegger's, and it is no accident that Foucault's "complementary thesis" at the Sorbonne was a translation and commentary on Kant's *Anthropologie in pragmatischer Hinsicht.* Cf. Macey, *Lives of Michel Foucault,* 88–90, 111; Eribon, *Michel Foucault,* 110–15. In the late 1970s, a critical turn emerged, as Foucault developed interest in Kant's essay "Was ist *Aufklärung?*" Cf. Kelly, *Critique and Power.* On empirical anthropology, see Linden, *Untersuchungen;* Pickerodt, *Georg Forster;* Riedel, "Historizismus und Kritizismus."

Metaphysik der Sitten and *Die Metaphysik der Sitten.* But the third critique, *Kritik der Urteilskraft,* laid no such metaphysical foundation for a science of humans. For the third critique really answered the question, What is a human?

Aesthetics and Teleology

Kritik der Urteilskraft has as its three chief parts analyses of the beautiful, the sublime, and the purposive; or, to collapse these, of aesthetics and teleology. At the close of the introduction to the third critique, Kant tells us that *Kunst* mediates between nature and freedom, that is, between objects and persons.[92] By *Kunst,* he means art and techniques, or once more, aesthetics and teleology. The artistic-technical as the aesthetic-teleological mediates between nature and freedom. Art and aesthetics provide the link to morals, while technics and teleology provide the link to nature. Between the realms of objects and persons exists the realm of humans, fusing persons with bodies, and so possessed of and by aesthetics and teleology. Properly understood, the third critique is philosophical anthropology.

The science of aesthetics grew in the Wolffian school. From Wolff's world-as-perceived arose the notion that aesthetics, a theory of human sensibility or subjectivity, lay at the base of our knowledge. Besides writing an influential Wolffian textbook on metaphysics, Alexander Baumgarten had also coined the term "aesthetics" in its modern sense, a word seen as typical of German metaphysics by those outside and long resisted abroad.[93] Baumgarten's *Aesthetica* begins: "§ 1. Aesthetics . . . is the science of sensitive cognition." Aesthetics used "taste" as a central concept. Taste had been the most subjective of the senses and, from antiquity through the Renaissance, had had nothing to do with discourses on art and the beautiful, which had been set rather around oral and visual, ultimately mathematical, harmonies. Up to the Baroque, the sphere of art and the beautiful had remained the opposite of the aesthetic: the noetic. This sphere was akin to those of the true and the good. "The emergence of taste [as a theoretical term] constituted the aesthetic subject" in the post-Cartesian era. Unlike angels and automata, humans were now constituted as aesthetic subjects. Wolff's world-as-experienced became, after Baumgarten and Kant, an aesthetic object. The emergence of the notion "culture" was part of the same historical process: the human world became an aesthetic object, one whose essence lay in experience and expression.[94]

92. Kant, *Schriften,* 5:198.

93. Ibid., 50 n. B35: "The Germans are the only ones who use the word 'aesthetics' to designate what others call the critique of taste." The article on "aesthetics" in the *Oxford English Dictionary* is instructive on English resistance to it.

94. Bäumler, *Das Irrationalitätsproblem,* 2. In the eighteenth century, emphasis on taste, or *Geschmack,* in education shifted to *Kultur* and *Bildung.* Note too, Kant, *Schriften,* 15[2]:569: "The sphere of women's sciences is characterized only by taste. Its teaching [text breaks off]."

Kant pursued aesthetics in the narrow sense in the third critique. But he had also opened the first critique with a "transcendental aesthetics." Here he claimed space-time to be the aesthetic base of human cognition, though by implication not necessarily that of other rational beings. In this sense, the first critique opened in an anthropological key; indeed, as a critique, instead of a doctrine or dogma, it was per se a philosophical anthropology. "Critique" as a concept and method came to Kant, not so much from the philological tradition, but rather from discourses on art and taste—in other words, from what becomes aesthetics. Critique is necessary as a method in disciplines for which, in scholastic terms, "dogmas" are not possible.[95] Kant displaced the metaphysical foundations of knowledge into a transcendental aesthetics, that is, a critique of human subjectivity.

The anthropological motif reappeared as well at the close of the first critique, as Kant recast science into the teleological realm definitive of the (non-angelic) human condition. Elsewhere he noted that Leibniz's *Monadologie* was "in itself a correct Platonic conception of the world, insofar as it is not an object of the senses, but rather . . . an object of the understanding, which however underlies the appearances of the senses." What did that mean? The "Architektonik" (B860–79) of Kant's first critique argued that each science was, in effect, a Leibnizean organic ensemble. "By 'architectonic' I mean the art of system. Since systematic unity is that which makes normal knowledge first into a science, i.e. a system out of a mere aggregate, and so is architectonic the doctrine of the scientific in our knowledge altogether."[96] He then equated the mechanical with aggregates, and the organic or purposive with the architectonic or systematic. The monadology was a correct theory of the systematic, teleological unity that human knowledge must have in order to be scientific. Kant remade the monadology into a philosophy of science.

Besides aesthetics, Kant's third critique treated of teleology, the key to enlightened Prussian and Kantian metaphysics. Kant defined the "organic" or the "organized" as an entity in which parts and whole mutually cause or reflect one another. This he tied as well to the notion of a system—as opposed to a machine—as a teleological unity.[97] In the third critique, he argued that in order for sciences of nature to be at all possible for us, we must presume an intelligible order in nature. We must presume, for example, that nature is undergirded by a purposive order that gives us such principles as the law of

95. See in general Cassirer, *Die Philosophie der Aufklärung*, chap. 7.

96. Kant, *Schriften*, 4:507; 3:538.

97. Ibid., 5:372–75; also 381–84. Much of this was made most clear, alas, in the "first version" of the introduction to the third critique, not yet available in the *Akademie-Ausgabe*; it is in Kant, *Kritik*, however.

economy *(lex parsimonia)*: nature never does with more what it can do with less, that is, entities are not to be multiplied without necessity. Without that principle and others, science as a system of knowledge would not be possible for us. Such principles of economy and system presumed a purposive or teleological order as a regulative ideal we posited for research.[98] The order of scientific knowledge, as the systematic, was neither mechanical nor rational; it was, rather, architectonic. For a science of nature to be possible, we must view nature as though it were an artistic-technical work. Kant made physico-theology and teleology into a philosophical anthropology of science: we were architects of the system.

Kant's first critique declared the old metaphysical sciences impostors. Ontology he transmuted into a transcendental analytics in the first chief part of this critique. In the second chief part of this work, he declared pneumatology, cosmology, and theology to be illusions, a dialectic of reason. By critique of these pseudosciences, he wanted to set metaphysical reason on the path of science in regard to the deity, the cosmos, and the soul. Yet he declared these dialectical, dogmatic pseudosciences to be inevitable lures of reason. As a Leibnizean-Wolffian, making the order of things mechanical and the order of persons rational in the first two critiques, he made the order of humans cultural in the third: artistic-technical or aesthetic-teleological. Kantian humans were embodied rational beings condemned to pursue culture, as art and science, with a natural disposition to metaphysics, ultimately part of anthropology.[99] From his dogmatic slumber, Kant awoke to the anthropological sleep in the apotheosis of culture.

Kant, Aufklärung, Kultur

> The life-history of Immanuel Kant is difficult to describe, since he had neither life nor history. He lived a mechanically ordered, almost abstract bachelor life. . . . I don't think the great clock of the cathedral there [in Königsberg] dispatched its daily work with less passion and more regularity than its fellow citizen Immanuel Kant. Getting up, drinking coffee, writing, lecturing, eating, taking a walk, everything had its fixed time, and the neighbors knew precisely that the clock must be at three-thirty if Immanuel Kant, in grey great-coat and Spanish cane in hand, stepped out his door to walk down the small Lindenallee. . . . But if Immanuel Kant, this great destroyer in the realm of ideas, by far exceeded Maximilian Robespierre in terrorism, he still has with the latter many similarities. . . . Indeed, to the highest degree, the character of the provincial revealed

98. Kant, *Schriften*, 2:427–43; 7:89; 8:89–106, 157–84; 9:311–20, 377–436.

99. Ibid., 4:362, a troubling passage.

> itself in both—nature determined them to weigh coffee and sugar, but fate willed that they weigh other things, and laid the one a king and the other a God on the scale.[100]

Immanuel Kant had a small, skinny, and frail body, but he was never once seriously ill, till his death neared. Over the course of fifty years, he arose every morning at five o'clock, awakened by Lampe, his servant for forty years, with the simple, military call: "It's time" *(Es ist Zeit)*. Kant drank for breakfast two or three cups of weak tea and smoked a pipe of tobacco. After the morning lectures, in his early years, he would often go to a café where he would play billiards now and again, and drink a cup of tea. Besides his tea, Kant drank usually only water and wine. He ate a big lunch and tended to put mustard on everything at every meal, as he was convinced that mustard aided memory. His favorite foods were cod, peas, turnips, caviar, and Göttingen sausages. He took a walk of an hour or more every evening between 4 and 7 P.M. The only recorded case of him missing his walk was when he was reading Rousseau's *Émile*. Kant was what is politely known as thrifty, as his students could testify, few of whom he ever allowed into his classes for free and from whom, or anyone else for that matter, he did not appreciate contradiction. He refused to lend money to poor Fichte, who found his lectures sleepy; and, though being without spouse or children, Kant left at death an academically immense estate of about 20,000 taler. A proponent of the French Revolution, even when it was passé, he never left Königsberg, so never visited the capital city of the king whose name he associated with *Aufklärung* and whose century he said it was. Kant once went twenty-five years without visiting his sister, although she lived in the same town as he. "Kant was namely a *misogynist*."[101]

"Our anthropology can be read by everyone, even by ladies at their *toilette*, since it is so entertaining." In his more well known lectures, Kant wrote that his anthropology was for "the reading public."[102] While Kant was interested in theological and cosmological issues, he seems to have been less interested in the pneumatological. One of his few works on pneumatology, *Träume eines Geistersehers, erläutert durch Träume der Metaphysik* (1766), is the strangest thing he ever wrote. What filled this void in the Kantian corpus was an interest in anthropology, philosophical and empirical. He was one of the first German professors to lecture on a subject he called *Anthropologie*. Indeed, from the late

100. Heine, *Werke*, 4:123–24.

101. Based on Gross, *Immanuel Kant*, 54–56, 79, 163, 184–93, 198, 225; Schwarz, *Immanuel Kant*; Rink, *Ansichten*, 109, 135; Kuhrke, *Kant*, 82–83; Metzger, *Aesserungen über Kant*, 8–9, 10 (quotation), 13, 15–16, 35, 42; Vorländer, *Immanuel Kant*; Schultz, *Immanuel Kant*; and Benninghoven, *Immanuel Kant*.

102. Kant, *Menschenkunde*, 6; *Schriften* 7:121.

1760s onward, for about thirty years, he lectured on anthropology in the winter semesters. The two passages cited above show the elision in the Enlightenment from women to the public. Along with cosmo-anthropology and physico-theology, does anthropology herald the collapse of metaphysics into the non-science of enlightened popular culture?

"Human reason has the special fate in one species of its knowledge: that it is pestered by questions which it cannot shrug off, since they are set by the nature of reason itself, but which it also cannot answer, since they surpass all ability of human reason." So began the preface to the first edition of Kant's first critique. It went on to relate that this special fate of human reason (spared angels and automata) was called "metaphysics" and that it had been a "battle-ground of endless controversies." Metaphysics was not only a science, she was "the *Queen* of all Sciences. . . . Now the fashionable tone of the time has brought it to showing her all contempt, and the matron laments, forsaken and forlorn." These metaphors of metaphysics as erstwhile queen of sciences were dropped from the second edition. In the first edition, royal metaphors had set an underlying political critique: "Our age is actually the age of critique, which subjects all to it. Religion by its sanctity and legislation by its majesty usually wish to withdraw themselves from that." But Reason objects.[103]

These remarks, which Kant also left out of the second edition, show that the first critique was meant as *Aufklärung* of a queen, which was just what he said on the two previous pages, where she was "the mother of chaos and night," awaiting "re-creation and *Aufklärung*." Kant wanted a constitutional monarchy, whereby a criticized, nondogmatic, enlightened metaphysics was restored as philosopher queen of science. In the preface to the second edition, he exchanged the royal metaphor for "experimentation." Critique was analogized to an experiment in natural science, in a hypothetico-deductive sense. The dogmatic queen would be set on the critical path by an experiment. So had metaphysical critique become depoliticized by 1787, signaling the end of *Aufklärung* in Prussia?

"We are *cultured* to a high degree by art and science. We are *civilized* to the point of overtaxing by all sorts of social courtesy and propriety"—so Kant's now famous saying from 1784, which Elias used as an epitome of the German opposition of *Kultur* and civilization.[104] We need not dwell on the fact that this

103. On the above, Kant, *Schriften*, 4:7–9 (Avii–xii).

104. Elias, *Über den Prozess der Zivilisation*, 1:8; the original is in Kant, *Schriften*, 8:26. Meiners's cultural anthropology, discussed in note 37 above, was historico-ethnological. By contrast, "philosophical anthropologies" studied humanity in terms of the natural and the spiritual: not in regard to nature and culture or society, but rather in regard to body and soul or *Geist*. That indicates the crucial role of the notion of *Geist* in the emergence of the notion of *Kultur*, linking anthropology with pneumatology.

opposition may not have been as clear as Elias would have it. Like others, Kant often conflated *Kultur, Zivilisation,* and *Aufklärung.* In his other famous essay of 1784, "What is *Aufklärung?*" Kant began by contrasting the animal with the enlightened existence. As appropriate to Prussian concerns, the motif of the animal became displaced in the essay by the motif of the mechanical. As the Wolffian clockwork cosmos seems to have been condensed into Kant as the Prussian automaton or mechanical man, the essay on *Aufklärung* ended with the sociopolitical insight that a human is more than a machine. *Kultur* and *Aufklärung* defined the truly human condition of society, as opposed to the animal or mechanical. Elsewhere Kant queried, "What is the natural condition of a person? The highest culture. What is the condition wherein that is possible? Bourgeois society." It was after all in such a society, as opposed to the academic or bureaucratic, that the "cosmopolitan" view, as he called it, was possible for philosophy. "On this view, philosophy is the science of the relations of all knowledge to the essential ends of human reason *(teleologia rationis humanae).* . . . Metaphysics is the perfection of all *culture* [in view] of human reason."[105]

The perfection of Prussian culture for Kant meant transcendental foundations for two sciences (of nature and freedom) and a critique of special metaphysics, which had concerned the three beings of interest to all humanity: the deity, the soul, the cosmos. The second part of the first critique, the "Transcendental Dialectic," recast this metaphysics into a rational reconstruction of the history of unreason. What had been metaphysical sciences in Halle into the 1760s, having largely then collapsed to cosmo-theology in Berlin, became a monument to metaphysical illness. As a Robespierre presiding over the Terror of the modern Prussian soul, Kant must be charged with a fitting crime. Driven now like Fichte to turn logic or *Wissenschaftslehre* into metaphysics, Hegel in the preface to *Wissenschaft der Logik* found the appropriate indictment: Kant had sided with positive science and common sense.

Conclusion

> When he was once speaking with Goethe on the nature of tragedy, Napoleon said that the moderns distinguished themselves from the ancients in that we no longer have a fate . . . and, in place of ancient fate, politics has arisen *[La politique est la fatalité].* This must be used then as the new fate for tragedy, as the irresistible force of circumstances to which individuality must cede.[106]

105. Kant, *Schriften,* 15(2): 885, 3:542, 549; see also 3:522, 542–50; 9:24–25.
106. Hegel, *Werke,* 12:339.

A number of things characterize the Enlightenment. One of them is the death of traditional metaphysics. Another is the birth of modern politics. Somehow bound with those is a critique of the notion of fate and the end of classical tragedy. That is why so many attempts to overcome the Enlightenment have turned not only to a rejection of modern politics, and with it the public sphere, have turned not only to a restoration of metaphysics, disguised often as the modern litany on the death of metaphysics, but have also returned to a habilitation of *fatum,* destiny, the miraculous, and, if not astrology, then teleology.[107]

Conceived in the reconciliation of Lange and Wolff, Prussian *Aufklärung,* as a state religion, though rational, could not be political. "In Germany, philosophical genius wanders further than anywhere else, nothing stopping it, and the very absence of a political career, so tragic for the masses, gives still more liberty to thinkers."[108] If the advent of modern politics and the novel were hallmarks of the French and British Enlightenments, then the Prussian *Aufklärung* showed its provinciality here. For, even in the slow death of metaphysics, wrestling with the reconciliation of nature and freedom, Prussian *Aufklärung* led not to politics and the novel but rather to *Anthropologie* and *Kultur.*

"An . . . essential appearance of the Modern Era lies in the event that art moves into the horizon of aesthetics. That means: the work of art becomes an object of experience, and thus art counts as an expression of human life. . . . [Another] modern appearance arises in that human activity is comprehended and fulfilled as culture."[109] The nature of Prussia became a cultural product, an artistic-technical object to be experienced and expressed. The apotheosis of culture at the close of the *Aufklärung* emerged not only in Halle with Semler's and Wolf's antimetaphysical, historico-critical theology and philology, but also in Königsberg with Kantian *Aesthetik* and *Anthropologie.* Nietzsche remarked that we would never be free of God so long as we still believed in Grammar. Let us say too: We shall never be free of Metaphysics so long as we still believe in Culture.

Like Leibniz's monadology, Kant's heavenly city has been the object of satire. In *Götzen-Dämmerung,* Nietzsche wrote: "'Who is the perfect human?' The bureaucrat. 'Whose philosophy provides the supreme formula for the bureaucrat?' Kant's." His theory of the person, founded on a realm of duty, may

107. On the miraculous, see Brunschwig, *La crise de l'état,* 217–69.
108. Staël, *De l'Allemagne,* 1:137; cf. Marx, "Zur Kritik," 381–87.
109. Heidegger, *Holzwege,* 73. This essay (from 1938) seems aimed against Cassirer.

be seen as a legitimation of the Prussian bureaucracy. The enlightened Prussian state was a teleo-mechanical automaton, an artistic-technical system governed by angelic and automatic bureaucrats. Kant's heavenly city was the metaphysical foundation of the new circle of knowledge from which no one could escape, the irresistible force to which Prussians had to cede: *la bureaucratie est la fatalité.* Friedrich II said as much in his dictum: The king is first servant of the state. This too was the secret of Hegel's master-servant thesis: The civil servant as bureaucratic master. In Romantic Prussia, Leibnizean-Kantian metaphysics, as a phenomenolgy of spirit *(Geist),* lived on in *Anthropologie, Kultur und die Staatsdienst.*

From the unfinished work of the civil servant philosopher of the heavenly city:

> The transc. philos. is the science of the forms by which one produces a whole in intuition and an object in thought synthetically according to principles.
>
> NB. Domestic: the dried fruit from HE Lehmann will not be given to the cook for keeping, but rather behind *the stove* in my dining room in a sealed sack or in 2 sacks which are often shaken . . .
>
> The subjective comes before the objective in intuition. The consciousness of oneself before the exterior and external thing.
>
> *Forma dat Esse rei.*
>
> There is in our well-water a styptic taste that I notice when gargling.
>
> The sack with the dried fruit behind the stove . . .
>
> Lampe hung my coat my nightshirt in the dining room behind the stove so that after the meal it could be put on while warm so that it would not be put on while cold. The cook like a mad one reproached Lampe that he leave her in peace and that she would not obey him as though he were Master *(Herr)* of the house. But she is the one who wants to play Master.[110]

In January 1802, Kant had to fire Lampe, his servant of forty years, who had a fondness for drinking that led him to indulge in the master's store. Lampe had also gotten married behind the bachelor Kant's back. Shaken by

110. Kant, *Schriften,* 21:112, 114, 121.

Fig. 13.3. Kant mixing mustard to improve his memory. The sketch is by Friedrich Hagemann, drawn in 1801 after a visit to Kant the previous year. Reproduced in K. H. Classen's *Kant-Bildnisse* (1924). By permission of the Universitätsbibliothek Göttingen.

having to remove his servant, while going slowly senile, as his *Opus postumum* above shows, so mixing more and more mustard to preserve his memory, as figure 13.3 shows, and perhaps meaning his servant's wife, rather than the man himself, the great philosophical anthropologist of the heavenly city penned, as the anecdote goes, one of his "memory notes" *(Gedächtniszettel)* to himself as

a tool of countermemory, the better not to forget to remember: "The name Lampe must become now completely forgotten."[111]

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111. Wasianski (1804) in Schwarz, *Immanuel Kant,* 326; on the firing of Lampe, 319–21. Cf. Weinrich, "Warum will Kant." Wasianski had Kant's *Gedächtniszettel* and so on, so the anecdote is doubtless based in truth. On Hagemann's drawing, see Classen, *Kant-Bildnisse,* 25–27; Kuhrke, *Kant,* 82–83. Cf. Foucault, *Dits et écrits,* 2:153: "De toute façon, il s'agit de faire de l'histoire un usage qui l'affranchisse à jamais du modèle, à la fois métaphysique et anthropologique, de la mémoire. Il s'agit de faire de l'histoire une contre-mémoire."

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