Maupertuis: The Man Who Tried to Flatten Leibniz

by David Shavin

The Man Who Flattened the Earth: Maupertuis and the Sciences in the Enlightenment
by Mary Terrall
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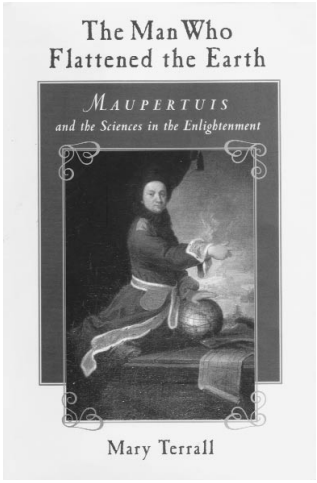
In the 18th Century, Pierre-Louis Moreau de Maupertuis was mainly known for two things: his expedition to Lapland to make geodetic measurements (showing that the Earth is flattened at the poles, and not at the equator), and his making a fool out of himself and the Berlin Academy of Science, in presiding over flagrantly political operations that attempted to eliminate the science of Gottfried Leibniz. The former accomplishment was largely a success of public relations, while the latter was so ugly, that it both poisoned Maupertuis's remaining days, and failed in a rather happy fashion.

Author Mary Terrall, an assistant professor of history at the University of California at Los Angeles, seems to have chosen to focus on Maupertuis because she finds that successful public relations is, for the science student of the 21st Century, the critical lesson to draw from his life. She thinks that the earlier, 1992 revival of Maupertuis, (David Beeson's *Maupertuis: An Intellectual Biography*), in trying to assess Maupertuis in terms of the status of his ideas, fails to appreciate his social skills and talents.

In following Maupertuis's movements and choices, Terrall has performed the useful task of showing how Maupertuis prostituted himself—although it certainly appears that she would have a new generation of scientists be seduced into the same practices. Maupertuis was quite adroit at flattery, at impressing women at salons, and evidently also in boudoirs. She quotes the Abbé Le Blanc: "M. de Maupertuis played his guitar at the toilette of duchesses and at the suppers of ministers. They have paid him with a position without responsibilities that was created just to



give him 1,000 crowns more than he already had."

But Maupertuis's facility would be extended beyond the salon.

Maupertuis's Career

Maupertuis's father was one of the pirates of Brittany, who succeeded in dispensing with his ships and converting to financial piracy on land, in such speculative financial ventures as the infamous "South Seas Bubble." His firstborn, Pierre-Louis, was educated to attend the salons of Paris.

Maupertuis's preference for gamesmanship over physical causality was established in one of his first papers for the Academy, his 1726 "Sur une question de maximis et minimis" (On a question of maximum and minimum). Here, as Terrall explains, he was "to find trapezoids of greatest and least area, given certain conditions for the lengths of the sides." He wrote an algebraic formula, differentiated it, and obtained not two, but four solutions—two of which were not trapezoids. Normally, such an event need not be fatal, should one simply go back and re-examine the axioms that misled one to propose such an overly broad algebraic encapsulization.

But Maupertuis evidently was wired differently. He proudly claims: "Nothing shows better the advantage of algebra over geometry in the solution of problems than this abundance with which it gives not only what we had meant to ask of it, but also everything depending on the same conditions and that we did not think of asking it."

This weakness for the magical fecundity of formalisms surely was not overlooked by whomever promoted his next career move. In 1728, Maupertuis made an unusual visit to the Newtonian establishment of London, where he was rapidly made a member of the Royal Society within about one month of his arrival. (It would take him a few more months, after leaving London, to cure himself of the syphilis that he had contracted there.)

Deploying against Bernoulli

Maupertuis then launched into his most difficult project—a three-year deployment (1729-1732) against the still-active Johann Bernoulli, Gottfried Leibniz's closest scientific collaborator. In 1724, Bernoulli had been slighted by the Paris Academy, in its essay contest promoting a "hard ball" (or "billiard ball") notion of physical causality. Bernoulli's essay showed that an analysis based upon the elasticity of substance, instead of a fundamental impenetrability, was powerful and correct. It was obviously the superior essay of the contest, but it was passed over in favor of Colin Maclaurin's Newtonian approach.

Bernoulli, based in Basel, had been trying for five years to persuade the Paris Academy to engage in a healthy discussion of the underlying issues. Maupertuis offered himself as Bernoulli's advocate in Paris. He then took advantage of the position to direct Bernoulli to demonstrate the main weaknesses in Newton, and indicate the lines of improvement in the product, so that Newton could be marketed outside of Great Britain.

Maupertuis's marketing of Newton in France exploited the unexamined axioms in Descartes. His opening

salvo, in 1732, *Discourse on the Various Shapes of the Celestial Bodies, with an Exposition of the Systems of Mssrs. Descartes and Newton,* argued that Newtonian "attraction being no less possible in the nature of things than [Cartesian] impulse, we can use both of them." In France, Maupertuis would offer his gentleman's agreement, whereby each faction's unexamined axioms and occult qualities would be allowed to circulate undisturbed as the debased currency of the scientific realm.

Voltaire joined Maupertuis's project that same year (1732), writing: "Your first letter baptized me in the Newtonian religion, your second gave me my confirmation. I thank you for your sacraments." For the next 20 years, these two, along with their shared mistress, Emilie du Chatelet, led the proselytization for Newton on the continent.

Perverting 'Least Action'

However, in the 1740's, when Maupertuis accepted the appointment to head the Berlin Academy, he had to dig deeper into his grab-bag of tricks to attempt to root Leibniz out of Germany. He would combine with Leonhard Euler in "glove-and-fist" operations, where sophistry and naked threats were intermixed.

First, Maupertuis adopted the Leibnizian phrase, "least action," for his peculiar transformation of values in the Berlin Academy of Science. For Leibniz, a "least action" principle reflects the fundamentally good workings of God, whereby the Creator's handiwork betrays a pattern that is increasingly intelligible to man, made in His image. God works intelligibly, not randomly. For Maupertuis, such a principle reflects God's laziness.

In the specific case of the refraction of light, for example, from a less dense to a more dense medium, the light follows a "least action" pathway. However, instead of taking the path of least distance, as in the case of reflection (the case of a "zero" change in the density of medium), the light takes the path of least time. For Leibniz, this has several implications; namely: Action is more fundamental than any resultant distance; reflection is a derived (and collapsed) case of refraction; and sine/cosine—or circular—values are more real and causal than mere length—or linear—values.

Maupertuis explicitly reverses this. In the paper which was the basis of his inaugural address to the Berlin Academy, Maupertuis asks: "What preference could it [light] have for time over distance?" He argues for the more "common-sensical" notion that what we think we can see—length—must be primary; and the somehow metaphysical notion of circular constructs (sines or cosines) must be derived from the linear.

Académie Française

Pierre-Louis Moreau de Maupertuis (1698-1759): An advocate of the senses, the sensual, and Issac Newton, and an antagonist of the ideas and method of Leibniz and Bernoulli.

For Maupertuis, God has already invented the law of reflection (of least distance). This must be primary for God, because we stumble upon it first. Therefore, God would not be acting in a "least action" sort of way if he were then to invent a higher order law of refraction! So, with regard to refractive phenomena, it seems that man simply has some sort of confusion of his senses; and the road to clarity involves his getting back to the basics of scalar lengths—and, in general, the basics of the five animal senses.

In 1750, Maupertuis attempted to put his new and improved "least action" principle on a royal pedestal in Berlin, by publishing a particularly ornate presentation of this mess, his *Cosmologie.* But in 1751, a Professor Samuel Koenig (a former student of Bernoulli and Christian Wolff) issued a public challenge, correctly asserting that Leibniz had developed the "least action" principle, and that it was not what Maupertuis was peddling. It was for Euler to bring down the fist, with a public trial in 1752 that railroaded Koenig. But its heavy-handedness demoralized the Berlin Academy and disgraced Maupertuis, who began to suffer illnesses that kept him from public duties. It also fired up two young geniuses, Gottlob Lessing and Moses Mendelssohn, to come to Leibniz's defense, and to successfully ridicule the folly of the science dictators.

In sum, from 1746 to 1755, Maupertuis and Euler had assaulted Leibniz's legacy at the Berlin Academy, in operations that included: the "least action" charade; a rigged Academy 1746-1747 "contest" against Leibniz's concept of the monad; and another 1753-1755 "contest" designed to reduce Leibniz's concept of "the best of all possible worlds" to the amoral sophistry of Alexander Pope, that "all [that is] is for the best." Lessing and Mendelssohn matured from 17-year-olds to 26-year-old men, forged in battle against Maupertuis's sophistical truth-hating rule, and, in their own way, they proved yet again that it was indeed the best of all possible worlds.

Maupertuis never recovered.

The Leibniz Gap

Mary Terrall probably has done more work on Maupertuis than anyone in history, including original translations of many French and German documents. Unfortunately, she is largely illiterate with regard to Leibniz—and that does cause a few problems when one's subject is put forth as the leading antagonist to Leibniz. Among a voluminous list of sources that she has read, her only listing for her study of Leibniz is Philip Wiener's 1951 English-lan-

Gottfried Wilhelm Leibniz (1646-1716)

Johann Bernouilli (1667-1748)

guage *Selections.*

When Terrall is concerned, for example, to connect Maupertuis's use of the term "perception" with his reading of Leibniz's *Monadology,* she prefers to use Wiener's English translation of this sensitive French text, despite her habitual use of French texts. At times, matters become a bit ludicrous. She begins a footnote, "On Leibniz's vision for the Berlin Academy, see. . ." and then she proceeds to cite a commentator's 23-page article from a 1996 *Isis* magazine, instead of simply referencing Leibniz's own (much shorter) article on his idea for his Academy.

There is no blushing here, just deeply ingrained habit. No one is supposed to actually study Leibniz, in the sense of having an open honest relationship with Leibniz's works. As such, Mary Terrall herself is a typical, modern-day scholarly victim of what the Maupertuis operation originally set out to accomplish.

Again, in the critical section on Maupertuis's treatment of Leibniz and Fermat on refraction and "least action," Terrall completely misses the point. She explains the preference of Maupertuis's God for matter over action: "God prefers a world functioning economically, where all changes or motions cost the least 'expenditure.' " The implicit assumption is that action is measured in terms of the less "expensive" matter, and/or that God prefers entropic dead matter to action.

In this section, Terrall seems to rely on on A.I. Sabra's *Theories of Light from Descartes to Newton,* which follows Euler's secondary argument that Leibniz really assumed that light moved faster in a denser medium, and that he differed from Fermat on the matter. She would have done better to have read the short analysis of light moving through increasingly more-dense media, in the historic collaboration between Leibniz and Johann Bernoulli, known as the brachistochrone problem.

In fact, in 1742, Bernoulli, as an old man, republished that same 1696-1697 brachistochrone material that he had instructed Maupertuis on back in 1730. And just two years later, in 1744, Maupertuis wrote his contrary version of the same. Because this is just the sort of textual history that Terrall otherwise specializes in, it only emphasizes what a massive blind spot she has in areas of basic literacy of Leibniz's work and thought.

Deeper into the Leibniz Pit

Terrall believes that she is correcting the record, where the 1992 Beeson biography had too simply assumed that Maupertuis was anti-Leibniz. "Beeson exaggerates Maupertuis's anti-Leibnizian views," she writes, whereas she presents Maupertuis as more even-handed during the first big attack against Leibniz at the Academy. But what Terrall succeeds in recounting is how Maupertuis relied upon Euler to do the dirty work, while he kept at arm's length.

Simply summarized, the anti-monad contest was launched in the first weeks of Maupertuis's presidency of the Academy in 1746, and Maupertuis ran cover for Euler, as Euler ran the committee that chose whatever anti-monad essay was available. The controversy was massive, and years later, Euler bragged about the protests of the Leibnizians.

Terrall's pains to paint Maupertuis as an innocent bystander in all this, ensnare her, rendering her account both weak and biased. For example, she asserts that Euler's early public declaration to the potential essayists as to the anti-monad orientation of the judges, was somehow counterbalanced by protests registered after the essays had been written. Her phrase is that there was an airing of "the whole controversy before the essays had even been collected by the prize commissioners."

But the essays had largely been written. She couldn't possibly think that this would cure the bias; but she could think it were important for Maupertuis to appear well-intentioned.

Terrall claims a more dispassionate view of Maupertuis's attitude toward Leibniz, a view acknowledged to stem from Ernst Cassirer, the Marburg neo-Kantian who taught at UCLA during World War II, and who said that Maupertuis was close to Leibniz. Maupertuis, Terrall says, simply "substituted physical points for Leibniz's metaphysical points, transferring the properties of monads to material particles and undercutting the foundations of Leibniz's system."

What must she understand of Leibniz's concept, if she also thinks this substitution a minor matter? And, in fact, this line was almost exactly the same as Euler's public threat referred to above—that monads could not be metaphysical, as only materiality could be allowed to account for causality.

With friends like this, one doesn't lack for enemies.

Terrall's supposed improvement upon the account of Cassirer is based upon the realization that he doesn't "address the ambivalence of Maupertuis toward Leibniz, which is related to his position

in Berlin." It turns out that Maupertuis's operations against Leibniz, and his shocking thuggery against the poor Professor Koenig, were psychological abreactions, the result of his guilt in taking over the Berlin Academy from Leibniz. We can assume that modern day science controllers may also experience such abreactions, but now they might be understood and, perhaps, ameliorated.

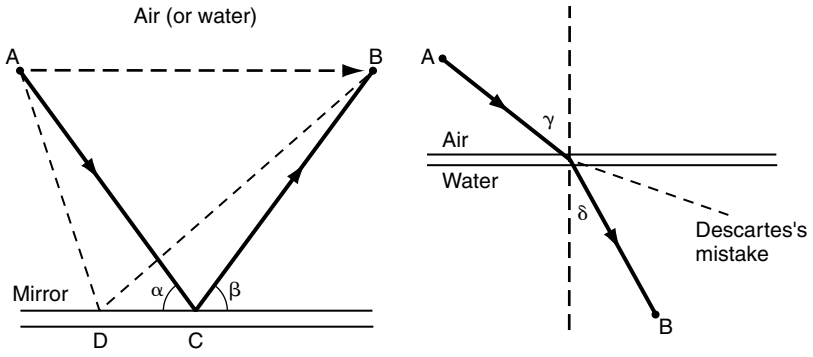
The 'Science' of Seduction

In the final analysis, Terrall's praise for Maupertuis is that he was a master of seducing the ruling elite. Her account of Maupertuis's 1744 *Venus physique* displays the author at the height of his art. At the peak of his stature and sinecures in France, and in the midst of his work on refraction and "least action," Maupertuis instructs and entertains the upper class on the latest curiosity, an albino African boy displayed in Paris.

Maupertuis's biology and genetics lessons for ladies, first invites the (idealized female) reader to consider her own body, and then begins to explain that pleasure drives all, and that the sperm does not impregnate the egg, but genetic material comes from intermingled juices: "She who charmed him ignites with the same fire that burns him; she gives herself up to its transports; and the happy lover rapidly traverses all the beauties that overpowered him. He has already arrived at the most delicious spot. Oh, unfortunate man, whom a mortal knife [castration] has deprived of that state! If the blade had ended your life, it would have been less deadly. . . . In the human species, pleasure makes everything else disappear before it; in spite of a thousand obstacles to the union of two hearts and a thousand torments that are bound to follow, pleasure directs the lovers to the goal nature intended."

After establishing this pleasure-principle, and going on in this vein about the mating habits of various animals, he proudly announces: "I have searched several times with an excellent microscope to see whether there aren't similar animals [as in sperm] in the fluid that women produce."

Having revealed his bold research methods, his remaining audience is now prepared for the dizzying secret of the Newtonian attractive force. Not only are all the particles under the microscope driven by animal instinct, each for the other, but he: "cannot help pointing out that these forces and these affinities are nothing other than what other more daring philosophers call [Newtonian] attraction. This ancient term, revived in our times, at first shocked those scientists who thought they could explain everything without it."



REFLECTION

Shown is least action from A to B, given some reflection off a surface. Angle α = angle β. Least distance is seen; least time is implicit.

REFRACTION

Light minimizes the time of the trip —not the distance—from A to B. Sin γ/sin δ is the ratio of the refractive index of the media.

Animal instinct is the key to Newtonian gravity; and, as such, we can dance all around it and play with it and tease each other about it, but we should no more ask for an unwrapping of the workings of gravity than we should probe any deeper into the behavior of human bodily fluids. Or, we all depend upon occult forces.

Terrall summarizes Maupertuis's *Venus physique* saying: "The reader is left reflecting on the animality of human desires and behavior, within the highly stylized and eroticized framework of polite society and fashionable literature. The hybrid genre of the book suited the speculative content, more provocative than definitive . . . but nevertheless claiming an authenticity for its interpretation of phenomena." Ironically, this is almost a clinical description of Terrall's own book, except that her subject is not the dance of sex, but the dance of the so-called scientists in pursuit of a career.

Terrall's conclusion emphasizes the lessons for today's budding scientists: "[M]aking an identity in science under these circumstances entailed speaking simultaneously in distinct but related voices. The voice of the loyal subject and servant of the state alternated with that of the unfettered mind in pursuit of disinterested truth. Maupertuis saw academies as vehicles for receiving patronage from the highest circles of government and as a framework for dispensing patronage himself. His obsession with marks of honor, such as titles and pensions, betrayed his desire to assert the noble status of his calling. For Maupertuis, being a man of science was the means to reputation, and even glory."

The art of Terrall's book consists in her attempt to make all of this sound like a good thing.

Ironically, were the author to have looked out her window at UCLA at the right time, she would have seen members of the LaRouche Youth Movement out in the open air on campus, with pedagogies on the crucial difference in the cases of the reflection and the refraction of light (that is, that action is of a higher order than distance). There, the minds of excited students could focus on the change in the *idea* of least action itself, as a reflection of the "least action" characteristic of their minds.

Terrall would have witnessed—through the youth dialogues—scientific discourse and inquiry as a means for equipping human beings for pursuing truth and making history. And instead of being the author who depressed her students and readers about *The Man Who Flattened the Earth,* she might have reappraised her extensive familiarity with Maupertuis's words and actions, and written the tragi-comedy, *The Man Who Tried to Flatten the Mind.*