SOCIOPATHIC LYING

The Case of Sir Isaac Newton—or, What Was God Thinking?

by David Shavin

Editor's Foreword

In order to understand David Shavin's article below, the reader must become aware that he or she has (in almost all cases) been hoodwinked by widespread and nasty propaganda for a radically false view of what science is. If science were really the impossible chimera which it is claimed to be by the generality of our prestigious and non-so-prestigious media and academic institutions, then we would never have advanced to more truthful understandings of "man and nature," nor advanced our cultural and material civilization as we have done, as mankind, ever since our first entrance onto the stage of the universe millions of years ago.

To jump ahead here: to those who claim that it is "Newton" who was responsible for our ability to launch earth satellites and moon-landings, we will show that these achievements owe precisely nothing whatever to Newton.

Resuming the thread of our discussion: What exactly is this false view of "science" which must be exploded? One of the difficulties of defining it, is that it so saturates all our discourse to the exclusion of any possible alternative, that it seems at first that there is really nothing there to be defined. It seems at first that this false view of science is self-evident. Think here of the difficulties Eighteenth-century chemists had in reasoning through the properties of gases (mass, for instance), when they were only just beginning to work out the implications of the fact that each of them had actually spent his entire lifetime at the bottom of a vast sea of gas.

For initial, working definitions of the pseudo-science which everywhere surrounds us in the abused name of science, let us give two. One was actually proposed as a definition of "science" by some benighted person (I forget who), who wrote that "science is the mathematical description of natural phenomena." This was the bastard creed of that British author who prefaced a London edition of Benjamin Franklin's path-breaking work on electricity, with the statement that it was not science because it contained no equations.

A kindred, false, definition of "science" is the lowly one of "curve-fitting." I must admit that "curve-fitting" doesn't sound quite so prestigious as a job-description—but isn't it really the same thing as that first definition in the last analysis?

But before we can make any more headway here, we first have to go back to deal with the nitty-gritty of the reader's (most readers') actual life-experience of the distinctions we are trying to make here. The reason they feel impelled to defend the fraud, e.g., of Newtonian physics, is not because they have mastered it for themselves. It is because they fail to master it. Or better, they believe they "have failed"—as in "you flunk this course." They defend a caste-distinction all the more strongly, as one that they have tried, but failed to achieve for themselves. Even if they got good grades, they still know inwardly that they lack real knowledge. But all the more do they believe that this sort of knowledge must be out there somewhere—if not in their teacher, then in his teacher's teacher. It's all known, all of it—I'm certain of it! There are those who know it. Let's call them "the Cathar elect."

A corollary is that current scientific (mis-)education teaches that everything is known (at least in principle). This is reinforced by only giving students problems which were already solved long ago, perhaps by using the same simple-minded methods they have just been taught. Descartes even tried to limit the very definition of "problem" to only *those* problems! But the truth is that very little is yet known—as Dmitry Mendeleyev was at pains to point out in the preface to his great elementary chemistry textbook. The farce of so-called "dark matter" provides a ludicrous example. Many galaxies do not behave as they should according to Newtonian (ahem!) principles. Does this anomaly mean there is something "out there" that we do not yet understand? Not at all! It can only be more *matter* that we have been unable to detect—the Newtonian principles must stand! But this so-called "matter" cannot be seen, felt, touched, tasted…? Certainly the real, historical Isaac Newton, Newton the black magician, would be happy with this so-called "matter."

But now we must ask what is science actually—real, true science? It exists, and it is provably effective, but I cannot even begin to give anything like an adequate answer to that question—at least within the limits of this preface. David Shavin truly indicates how the bare-bones algebraic formulas which were falsely claimed as Newton's discoveries, were only dumbed-down, impoverished hacks of results which had been achieved earlier, and much more fully and usefully, by Kepler and Leibniz respectively—using methods which the Newtonians openly reviled. David also rightly asks whether light is alive, and whether matter is alive. In truth, there is no abiotic universe of physics—there is only the one existing universe. In it, the principle of life and the principle of creative mentation are everywhere active, and Max Planck truly said that you cannot get behind or beyond consciousness, even in the smallest particle—if such particle were possible. This is the hylozoic monism of Plato and his successors.

Plato's greatest living successor is now, and has long been Lyndon H. LaRouche, Jr., who wrote in an article that we have recently reprinted here, that the most fundamental principle of science is the absolute distinction of the human species from all animals. To go further in the study of what real science is, you could do much worse than to begin reading his historic writings which are being republished here weekly.

In conclusion, let me say here that if there is any truth in these paragraphs above, the reader owes it all to that same Lyndon H. LaRouche, Jr.

—Tony Papert

How can one tell if a British imperialist is lying?
His mouth is open.

How can one tell if British imperialism is dying?
The stiff upper lip drops and the lying spews out of control.

Introduction

June 13—There are some individuals one meets in life, where lying is not the exception to the rule, but is the rule; and the chief fear that one has in confronting such a person on a given lie, is that, inevitably, the next day an even bigger whopper will be the result.

The recent period has witnessed the one boldly ridiculous lie after another, coming out of those formerly "stiff upper-lip" fellows associated with the British Empire. The cases that jump to mind go by the name of the "Steele Dossier," the "Skripal Affair," and the "Syrian White Helmet video series." As the lock-step control over their "dump American giant" has come unglued, the feebleness of their vaunted methods is exposed. The appropriate image is the scene at the end of "The Wizard of Oz," where the all-powerful wizard is unmasked. Behind the screen, and the smoke and mirrors, is a rather pathetic individual.

Isaac Newton

Enter Isaac Newton—perhaps the epitome, and the central image, of British imperial lying from the beginning. Here we present the completely overlooked story of Newton's so-called "solution" of the Brachistochrone Contest, where the Newton lie was most completely exposed. In reading this story, the reader would best be advised to forget any impressions he or she might have picked up along the way regarding a so-called Newton-Leibniz controversy as to who first developed the calculus.[1] That whole controversy was manufactured as a reaction to Newton's embarrassing failure in the 1697 Brachistochrone Contest. It became the central cause of the wild flight-forward assault against Gottfried Leibniz, the strategic development that doomed the Empire and made the American Revolution necessary.[2]

I. Newton's Bluff

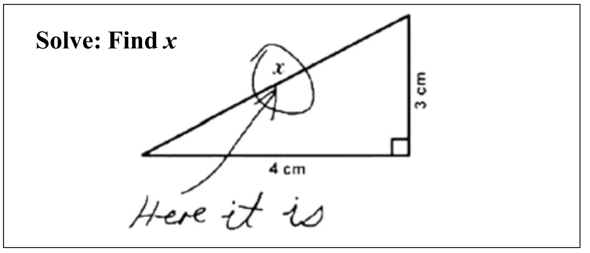
In May and June of 1696, Gottfried Leibniz and Jean Bernoulli initiated a public scientific contest around the unpacking of the workings of gravity. The question was quite general: What path would a particle trace out if it were to fall under its own weight, taking the least time (that is, brachisto-chronos, or shortest-time) to go from a higher point to any given lower point?[3] However, the solution was quite particular. Even more important than a correct solution was the method behind the solution, and Bernoulli promised that the working out of the solution involved a wealth of riches for the developments at the core of the calculus.

However, Isaac Newton, the supposed master of gravity and inventor of the calculus, not only did not have a clue, but in fact emitted a response that deserves to be on the all-time list of bloopers and buffoonery. Even worse, for the last three centuries, no one is supposed to point out that the emperor is not wearing any clothes. However, given the behavior of recent emissions from the British establishment, perhaps an unblinking look is long overdue.

Early in 1697, Newton sent his supposed solution to his sponsor, Sir Charles Montague, the head of the Royal Society and the founder of the Bank of England. Newton drew a cycloid, and then he showed that it can be enlarged to pass through the designated point. That is it. No explanation as to why or whether the cycloid solves the problem, no new methods developed, no joyful wealth of developments.

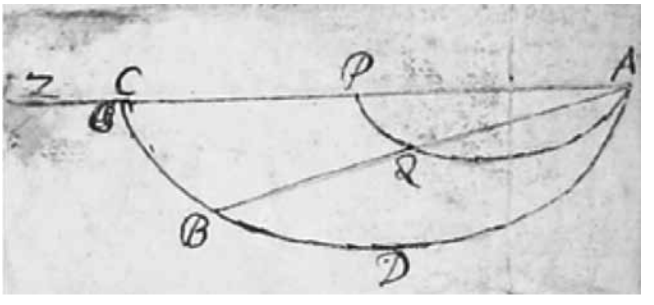
It is difficult to convey how ridiculous Newton's submission is, but there is a joke passed around by math teachers of note. A right triangle is drawn with the two smaller sides labeled with lengths 3 cm and 4 cm, while the unknown side—longest side, the hypotenuse—is labeled "x".

The instruction for the student is, "Find x." (Students who learned their Pythagorean Theorem know how to add the square of 3, which is 9, to the square of 4, which is 16, and get the sum of 25. They then take the square root of 25 to get the value of x as 5.) However, this clueless—though bold—student tries to bluff his



way through, simply circling the "x" and answering the teacher, "Here it is!"

Surely, Isaac Newton deserves better than this, wouldn't you think? Let's examine his actual complete submission, the one that Montague had published anonymously in the 1697 *Philosophical Transactions*, the periodical of the British Royal Society. Hint: it looks a lot more imposing than it is!



Newton's diagram from his letter to Lord Montague.

"**Problem.** *It is required to find the curve ADB in which a weight, by the force of its gravity, shall descend most swiftly from any given point A to any given point B.*

"**Solution.** *From the given point A let there be drawn an unlimited straight line APCZ parallel to the horizontal, and on it let there be described an arbitrary cycloid AQP meeting the straight line AB* (*assumed drawn and produced if necessary*) *in the point Q, and further a second cycloid ADC whose base and height are to the base and height of the former as AB is to AQ respec-*

1. First, Newton never understood the full-blown power of Leibniz' "analysis situs" method, which developed the powerful inverse relationship of differentiation and integration. Second, Leibniz, and many others, had no trouble understanding Newton's limited calculation tricks. Newton was certainly not alone in developing and extending such techniques.

2. H. Graham Lowry, *How the Nation Was Won—America's Untold Story 1630-1754.* Available as epub, Kindle, or PDF.

3. In the reduced case of the lower point lying directly underneath the upper point, the workings of gravity are not made explicit.

tively. This last cycloid will pass through the point B, and it will be that curve along which a weight, by the force of its gravity, shall descend most swiftly from the point A to the point B. QEI (what was to be found)"[4]

That really is it. Don't be fooled by the hand-waving. Newton drew a horizontal line, hung a small cycloid from it, and then demonstrated he could enlarge that cycloid to a larger cycloid, one that could include both the starting point A and the end point B. He could just as well have drawn a squiggly line from A to B. There is no clue as to why he is drawing a cycloid, nor is any method demonstrated.

What Newton has effectively said here is: "My solution? Draw a cycloid curve from A to B. Oh, that's too obvious? I'll generalize that for you. Draw a cycloid anywhere and I can move it so that it connects A and B." It is even sillier, when one considers that the problem as posed never required B to be any special distance from A, simply at a lower level. The only "method" Newton displayed was in answer to a trivial matter that had nothing to do with the problem.

Perhaps the kid who circled the "x" should have demonstrated that his method was quite powerful, because it could be generalized so as to be made capable of circling not just "x," but any letter of the alphabet desired!

For over three centuries, Newton's promoters have lauded this solution as proof of the superior power of his mind, and as the perfect reproach to Leibniz and Bernoulli for ever daring to challenge Newton. Let's put this buffoonery in context. Don't worry about the mathematical formulas; an accounting of the core of the brachistochrone puzzle will be provided in Section V.

II. How Did Poor Newton Find Himself in this Awkward Situation?

Isaac Newton was a talented youth who, early on in his career, took a dark path. Today, as a first approximation, one might think of victims of video-games, who deem themselves all-powerful in their fantasy world. "A mind is," indeed, "a terrible thing to waste." In this case, it led Newton into some uncomfortable career choices.

In 1684, Newton was chosen, by those who would turn England into an Empire, to craft a counter to the developments in science on the continent of Europe by Johannes Kepler and Gottfried Leibniz. At that point in life, the forty-one-year-old Newton had been for all his life a loner, whose primary work had been an obsessive and isolated search for the alchemical mysteries (whereby, e.g., one could manufacture gold from cheaper constituents). He had also mastered many computational and approximation techniques.

Edmund Halley[5] visited Newton, proposing that he reduce to a mathematical system Kepler's beautiful and harmonic physical-science development of the solar system—where the sun's role, involving nothing less than light, heat, radiation, rotation, magnetism and the pull of gravity, was all one dynamic whole.[6] Could Newton reduce the sun's activity to an inverse square law, an equation where the pull of the sun on a planet diminished by a constant number times the inverse of the square of the distance? For example, the pull at a million miles away would calculate as four times as much pull, two million miles away.

The Euclid Method—Hide the Cow But Get the Milk

This was a time-honored project to market the results of a scientific breakthrough while simultaneously obscuring and covering up the very real creative mentation that created the breakthrough. The classic case was Euclid's reduction of the achievements of two centuries of Pythagoreans and Platonists, notably including Theaetetus' development of the mutual harmonies of 'objective' space and 'subjective' hearing.[7] Sounds complicated, but anyone who has ever had to blindly follow step-by-step instructions with no overview, but where the lawyers had more to do with the wording than the engineers, might approximate the issue involved here. In Newton's case, the regularities of the solar system, including the workings of gravitational pull, would be simplified to the interplay of two objects at a certain distance—and the poor student is left with some magical force acting over some distance through some evac-

4. Letter of Newton to Montague.

5. The story of the breaking and recruitment of Halley to anti-science activities is one that involved the mysterious 1679 fire where all of Johannes Kepler's manuscripts were stored. See: http://por-la-glass-stea-gall.blogspot.com/2014/ 02/the-transit-of-venus-or-cranes-of.html

6. Johannes Kepler, *The Harmony of the World*, 1619.

7. An over-simplification, but Kepler developed how the known bodies of the solar system were arranged in harmonic coherence with the musical scale, a project set out in Plato's *Timaeus* dialogue.

uated space. Newton took the assignment, and in 1687 delivered his *The Mathematical Principles of Natural Philosophy*—for short, the *Principia*.

Leibniz responded to this mathematizing operation by developing Kepler's solar dynamics further in his 1688/9 "Essay on the Cause of the Celestial Motions." In short, this led directly into the consolidation of his alliance with the Bernoulli brothers, and to intensive work on the physical, transcendental curves—particularly the cycloid, the catenary, and the brachistochrone. In the case of the cycloid, Newton's public posture had usefully provoked scientific developments that threatened his role, and were a boon for the world!

'Would Someone Close the Window?'

The reclusive Newton did not take easily to his new public role. The *Principia* project put him forward as the leading scholar of England's 1688/9 "Glorious Revolution," and Newton's rabid anti-Catholicism put him into the new Parliament. There Newton suffered in silence, evidently too terrified to speak. The only speech recorded of Newton during his tenure in Parliament was a one-liner, to the effect: "Would someone close the window?" He left Parliament in 1689, plunged into his alchemical musings, suffered apparent rejection by his dear Fatio de Duillier, and spent most of 1693 in mental disarray.

It wasn't until Lord Charles Montague, the founder of the Bank of England in 1694, appointed him to the Royal Mint in 1696 that Newton found solid footing again. He particularly relished tracking down counterfeiters and executing them. As of the June 1696 Brachistochrone Contest, Newton's passion was not related to the contest's goal of the betterment of mankind through the pushing forward of scientific boundaries—but he had allowed himself to be put forward as the great thinker of England. Hence, he found himself in a rather awkward situation.

III. Why Didn't Newton Simply Ignore the Contest?

God knows, he certainly tried to.

In brief, Leibniz and Bernoulli forced the issue, as follows. In June 1696, Johann Bernoulli published in the well-known *Acta Eruditorum*, the scientific journal founded by Leibniz, an article on how Leibniz's calculus was the appropriate new invention to tackle and solve the gaps in classical geometry. At the conclusion of that article, Bernoulli offered the example of the brachistochrone problem: What pathway would a particle trace out, in the shortest time, when falling only under its own weight from a higher position to any lower position? That is, how does gravity work? Newton had provided, in 1687, an equation to model the effects of the otherwise unknown gravity; Leibniz and Bernoulli had developed more powerful analytic techniques to begin unpacking how fundamental, though otherwise invisible, actions in nature work.

Bernoulli stressed that the solution was highly valuable, both for the richness of the result and even more for the powerful development of analytic methods involved in drawing out the solution. Further, in telling mathematicians that the solution was one of a small grouping of very well-known curves, Bernoulli made clear that the answer was neither tricky nor obscure—and that guessing from a small group of curves really wasn't the point of the contest.

The deadline for the solution of the puzzle was given as the end of the year. Mathematicians at Oxford, long-time colleagues of Newton with a history of numerous communications, began working on the puzzle no later than September 1696. It is not likely that Newton was unaware of the contest for over half a year (from June 1696 until late January 1697), but that is his story.

The Puzzle Circulates Prior to First Deadline

Prior to the June 1696 publication, Bernoulli had more than a few communications with Leibniz on the development of the transcendental curves and of the accompanying calculus. It was no surprise to Bernoulli that Leibniz, in June, immediately upon reception of Bernoulli's letter, could provide a solution (developing the correct differential equation from the conditions of the puzzle). Leibniz commented that the problem was most beautiful, and that despite his schedule and obligations, it attracted him against his will. Of note, the first person that Leibniz made sure to send the problem to was his friend in Florence, Italy, Rudolf Christian von Bodenhausen. Leibniz encouraged him to work on it, as it was a matter of extraordinary beauty.[8]

8. Leibniz had visited Bodenhausen in Florence, Italy, in 1689, where he was the tutor of the sons of the Grand Duke, Cosimo III. Leibniz had just finished his work on Kepler's dynamics. The visit was also a likely occasion impelling Leibniz's work on the catenary, as he could not have missed the dome of the Florentine Cathedral, Il Duomo. (Bruce Director

Bernoulli had also sent the puzzle, in May, 1696, to Pierre Varignon in Paris for circulation to the mathematicians of France. Varignon reported that he was "immediately rebuffed by its difficulty" and that he was not aware of "anyone, of all those to whom I announced your problem who has resolved it." In July, Bernoulli writes to Leibniz that neither the French nor the British have been able to solve the puzzle.[9] As the December 31st deadline approached, it is known, from correspondence between two of the Newton's colleagues, John Wallis and David Gregory, that their efforts to provide a demonstration have failed. At this point, December 1696, Newton was content to choose silence as the best course of action.

Bernoulli Takes Aim at Newton

At this point, Bernoulli had received only two correct solutions—one from Leibniz and one from his older brother, Jacob. Leibniz requested Bernoulli to extend the deadline, and in the December, 1696 *Acta Eruditorum*, Bernoulli announced that the new deadline was going to be Easter, 1697. Furthermore, on January 1, 1697, he composed a leaflet on the contest, one that put Newton in the cross-hairs. He sent the leaflet, amongst other places, to the French *Journal des scavans* and the British *Philosophical Transactions*. But he also made a point to have one delivered directly to Newton, taking away any possible "hidey-hole." The leaflet, called the "Programma," began:

> To the sharpest mathematicians now flourishing throughout the world.... We are well assured that there is scarcely anything more calculated to rouse noble minds to attempt work conductive to the increase of knowledge than the setting of problems at once difficult and useful, by the solving of which they may attain to personal fame as it were by a specially unique way, and raise for themselves enduring monuments with posterity. For this reason, I ... propose to the most eminent analysts of this age, some problem, by means of which, as though by a touchstone, they might test their own methods, apply their powers, and share with me anything they discovered, in order that each might thereupon receive his due meed of credit when I publically announce the fact.
>
> The fact is that half a year ago in the June number of the Leipzig *Acta*, I proposed such a problem whose usefulness linked with beauty will be seen by all who successfully apply themselves to it.... Only the celebrated Leibniz, who is so justly famed in the higher geometry has written me that he has by good fortune solved this, as he himself expresses it, very beautiful and hitherto unheard of problem....

Base and Venal Soul?

There was no way that Newton, or any other reader, could miss Bernoulli's explicit targeting of Newton in his "Programma": "Since nothing obscure remains, we earnestly request [mathematicians....] to bring to bear everything which they hold concealed in the final hiding places of their methods." Further, the prize is virtue, "not gold or silver, for these appeal only to base and venal souls from which we may hope for nothing laudable, nothing useful for science." (In 1696, Newton had finally attained his lucrative post as Warden of the Royal Mint.)[10] Rather the problem requires "solutions which are drawn from deep lying sources." Finally, in an unmistakable allusion to Newton's treatment of Kepler, the leaflet adds that "so few have appeared to solve our extraordinary problem even among those who boast that through special methods, which they commend so highly, they have not only penetrated the deepest secrets but also extended its boundaries in marvelous fashion; although their golden theorems... have been published by others long before."

Newton would recall this moment, bitterly, for years

develops LaRouche's discovery of the catenary-basis for the cupola: https://www.schillerinstitute.org/fid_02-06/031_long_life_catenary.html.) Regardless, it is known that Leibniz presented his new work on dynamics, work that, via Bodenhausen, might have influenced Stradivari's revolutionary "bel canto" violins (called the "Long Strads") presented to Cosimo III the following year.

9. "... nor the British." It is not known if any English mathematician communicated to Bernoulli directly. However, Bernoulli's younger brother, Hieronymus, was studying at Oxford and communicated with Johann. Hieronymus is thought to have been in touch with Wallis on the contest and would have known about the lack of progress.

10. Charles Montague, Chancellor of the Exchequer, set up the Bank of England in 1694 with the aid of John Locke. Over 1695/6, they established their team at the Royal Mint: Isaac Newton, Edmund Halley and Thomas Molyneaux. Were Locke's team Plato's philosopher-kings, organizing a republic? Unfortunately, they rather resembled hired sophists for an empire—more concerned about money manipulation than about production. Locke and Newton wrote dissertations on how to speculate on the relative valuations of gold and silver in various countries.

to come. In particular, in 1699, Newton interrupted his letter to Flamsteed to announce, seemingly out of the blue: "I do not love to be printed upon every occasion much less to be dunned and teased by foreigners about Mathematical things. . . ."[11]

IV. Smoke and Mirrors

We are at one of those too rare moments when the imperial bullies get caught, having to fight on a battlefield which wasn't designed ahead of time in their favor. In other words, they have to fight out in the open—where they don't appear so unbeatable. An inspection of their shenanigans, under such circumstances, says a lot about what their methods were all along, when they had been hidden. In January, 1697, there is, indeed, a lot of pressure on Newton and Montague to respond. Here is where "Mr. Smoke and Mirrors" makes his appearance

The Surviving Cover Story

But first, one bit of housekeeping. Let us briefly, in two paragraphs, dispense with the more familiar cover story still used to this day: So the story goes, Newton came home from his important post at the Royal Mint one afternoon at 4 p.m., saw the challenge, and worked continuously until 4 a.m. the next morning to come up with his so-called "solution." That story—as with the other famous myth of the apple falling from a tree—was the product of public relations efforts some thirty years later.

The anecdote is alleged to be from the testimony of Newton's half-niece and housekeeper, Catherine Barton. However, since she was, at the time in question, neither in London nor his housekeeper, she did not, in fact, witness anything. At best, she was repeating what Newton himself had told her later on.[12] After Newton's demise in 1727, Catherine's husband, John Conduitt, in his role as a promoter of Newton's image, recorded the anecdote and cited his wife as the witness. (Conduitt was also Voltaire's source for the Newton "apple" story.) Further, that story is itself wholly dependent upon never actually looking at Newton's submission. Certainly, it would not have taken even twelve minutes, much less twelve hours, to come up with what Newton submitted.[13] Still, this story is the first thing brought up should anyone inquire about Newton and the Brachistochrone Contest. With that dispensed with, we turn to the shenanigans of 1697.

The Timing

There was a major effort to play with the timing of Newton's involvement with Bernoulli's challenge. Newton wrote on his copy of Bernoulli's leaflet, at some point, that he had received it on January 29, 1697, more than five weeks after it had been sent.[14]

Next, Newton's solution gives the appearance of being sent to his sponsor, Montague, the next day, on January 30th. However, the date on it was not in Newton's handwriting, and it was apparently added later. It is thought to be in the known script of Hans Sloane. Since Sloane was President of the Royal Society from 1727 to 1740, the period of time when Conduitt's "Newton-solved-it-overnight" story was born, it makes sense that the date was added to buttress the story.

Regardless, if the January 30th date is correct for the submission Newton sent to Montague, then there seems to be a delay of a couple of weeks in the normal procedure before the perfunctory reading to the Royal Society. Regardless, mid-February seems to be the first public event associated with Newton's non-solution. The minimal inference one can draw from all this is that it was at least an eight-week period from the sending of the "Programma" challenge to Newton's response. Hence, whatever time was eaten up by the delivery process, one can only guess that the rest of the time involved unsuccessful attempts to come up with a solution. It is most reasonable to assume that there were

11. Newton's clinical outburst on this matter was provoked by Flamsteed's mere reference to Jeremiah Horrocks. Newton knew that this young Keplerian genius of 1630's England had taken a serious and honest approach to Kepler. Mysteriously, in 1641 he dropped dead at age 22, and most of his papers were burned or lost. There was an attempt in England to revive Horrocks' work in the 1660's (Newton's student years). Newton joined up with those who would bury Horrocks for a second time. Hence, "Horrocks" was a trigger word for Newton. See: http://por-la-glass-steagall.blogspot.com/2014/02/the-transit-of-venus-or-cranes-of.html

12. Newton's care for his half-niece involved loaning her to his sponsor, Lord Montague, as his mistress. After Montague's death and his generous endowment left to Catherine, Newton married her to John Conduitt, whose own wealth had derived from his activities as Deputy Paymaster General for the British forces in Gibraltar. Otherwise, Conduitt inherited Newton's Master of the Mint position; and his noteworthy accomplishment in Parliament was to revoke the laws against witchcraft.

13. Perhaps the story had its roots in Newton's sensitivity to Bernoulli's published description that Leibniz had solved the puzzle immediately.

14. England's calendar was ten days behind Bernoulli's; so, Newton's January 29 was Bernoulli's February 8.

three to six weeks of deep anxiety. Yet, it gets "curiouser and curiouser."

The States of Mind of Newton and Montague

While Newton kept just about every worksheet and scrap paper throughout his life, it seems that no worksheet relating to his work on Bernoulli's challenge exists.[15] However, at least some of Newton's worksheets from this period do exist, and they reveal more than a little of the actual situation. There one finds Newton working on his alchemical transmutation of metals, where he explains that sulphur is "the most digested metal next to Gold, for tis Philaletha's King whose Brethren in their passage to him were taken prisoners r & are kept in bondage s by impure t & must be redeemed by his flesh & blood... For our crude sperm flows from a trinity of r immature s substances in one essence of which two (u & v) are extracted r out of ye earth of their nativity s by ye third ((u) & then become a pure milky virgin-like Nature drawn from ye menstruum of our sordid whore."[16]

It would be hard to make this stuff up ... or even to want to do so. With such noise in his head, perhaps Newton was doing well merely to draw the picture of the cycloid.

Meanwhile, Montague publishes Newton's solution in the *Philosophical Transactions* for January, 1697 (though their monthly journal was, as a matter of course, published at least one or two months after the date). On the surface, the actions of Newton and Montague would seem to be a violation of the terms and spirit of the contest, as the actual solutions were awaiting an Easter deadline. However, since Newton's solution didn't actually give anybody a clue as to anything, it in fact made no difference to the actual contest; but it does speak to the state of mind of Montague and his crowd. They appear to have been motivated to put something, anything, into the public record, while also making a point of not submitting to the authority of the contest. The desperation of the situation and their consequent recklessness trumped any possible blowback from the embarrassing submission.[17]

Ghost-Writer Called In

This brings us to the last part of the smoke and mirrors. During this time, David Gregory becomes fully engaged in trying to flesh out Newton's cryptic solution. (As we shall see, he became what would be the first in a line of Newton's colleagues who tried to do so.) Previously, in 1696, Gregory had been involved in a project, trying to recast Leibniz's work on the catenary into Newtonian language, but now, sometime before the middle of February, he properly turns to the work of Leibniz's mentor, Christian Huyghens, to pull together a draft on the cycloid. However, he is unable to figure out any way that Newton's vaunted "fluxional" equations do anything to help.

Gregory then meets with Newton on the problem. He made notes on the subsequent meeting, dated March 7th, and they seem to reflect an awkward incapacity on Newton's part to explain much of anything.[18] Finally, on March 17th, evidently after Newton's submission had already been sent off to Bernoulli, Gregory presents to the Royal Society his improved draft on the cycloid. That version was also published in the monthly of the *Philosophical Transactions*, though anonymously. The Newtonian faction would make a feeble effort to pass it off as Newton's second version; the not-so-naked version—but two years later, Wallis had to admit to Leibniz that Newton had not authored it. It was David Gregory.

The Initial Response of Leibniz and Bernoulli

So, neither Newton nor Montague officially recognize the *Acta* contest. They have published, prior to the deadline, their non-solution, and then they arrange for it to be transmitted to Bernoulli via their intermediary, Basnage de Beauval.[19] In late March, in time for the Easter deadline, Basnage sends it to Bernoulli, calling it the "anonymous English solution." On March 30th, Bernoulli writes back to Basnage, pointing out how there is little or nothing there—that the author has concealed his method, if he had one—and that this is unfortunate as the puzzle lies at the frontier of pushing sci-

15. Whiteside, D. T. *The Mathematical Papers of Isaac Newton*, Vol. 8, 1981a, p. 74/5. Whiteside himself notes this curious situation.

16. From Newton's "Praxis" manuscript kept at Babson College—and heroically acted out by Peter O'Toole in the movie, "The Ruling Class"!

17. Is this not the state of mind of such as the former head of the CIA, John Brennan, who, when caught in a lie, simply announces that he doesn't do evidence?

18. This author has not seen Gregory's notes; however, after Newton's latter-day defenders examine them, they offer the succinct account: "Either Gregory did not understand Newton's argument, or Newton's explanation was very brief." One can only imagine.

19. Basnage was an advocate in Rotterdam of John Locke. (Locke had been in the Netherlands for most of the 1680's, attendant there to the future King of England, William, prior to the 1688/9 invasion of England.) Otherwise, Basnage was made a member of the Royal Society in 1697, the same time as his role in aiding Montague, the President of the Royal Society.

ence forward. "I would only wish that Mr. Newton had done as we have, that is to say, that he had also published the method that had led him to the discovery of the sought after curve; because that is the way the public gains."

Dealing With Those 'Accustomed to Show Off'

Bernoulli then gives Basnage an example of what he means by acting for the public benefit: He had a more "mathematically-acceptable" solution, but was going to submit and publish his other solution, a concept-driven analysis of light and gravity. "Mr. Leibniz himself told me to do" as such, wrote Bernoulli, as there would be more public benefit. Then his suggestion to Newton: Bernoulli's light-gravity solution, as "simple as it is," is still "of great consequence, and could nicely serve those who are accustomed to show off at the expense of others, as a means of making some little new discoveries, which should be sufficient for them to claim for themselves the possession and all of the glory of the invention." That is Bernoulli's description of Newton's claim to fame, Newton's mathematization of Kepler in *Principia*. Rather, Newton should stop such silly games, for the actual brachistochrone solution is rich enough to help Newton lift himself above his previous habits. Of course, he would have to apply himself to real science.

V. Bernoulli's 'Light-Gravity' Solution

Here ends the chronological account of the nine-month contest. We now present Bernoulli's solution. The May, 1697 *Acta* publishes the six submitted solutions, those by Johann Bernoulli, Leibniz, Jacob Bernoulli, Ehrenfried von Tschirnhaus, the Marquis de l'Hospital, and Newton.[20] Leibniz's historical introduction to the submissions situates the contest in terms of the physical geometry of the transcendental curves, such as the catenary and the brachistochrone (cycloid). He restricts his comments on Newton's submission to the gentle barb: "Newton could solve this problem if he only undertook the task."

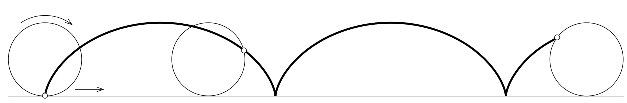
Bernoulli's entry opens with a characterization of what Newton, and others, have done:

> Up to this time so many methods which deal with maxima and minima have appeared that there seems to remain nothing so subtle in connection with this subject that it cannot be penetrated by their discernment—so they think, who pride themselves either as the originators of these methods or as their followers. Now the students may swear by the word of their master as much as they please, and still, if they will only make the effort, they will see that our problem cannot in any way be forced into the narrow confines imposed by their methods, which extend only so far as to determine a maximum or minimum among given quantities. . . .

He then holds up Leibniz as a model for Newton to apply to himself:

> [T]he celebrated Leibniz. . . . That he would indeed find a solution I had no doubt, for I am sufficiently well acquainted with the genius of this most sagacious man. . . . The future will show what others will have accomplished. In any case the problem deserves that geometers devote some time to its solution since such a man as Leibniz, so busy with many affairs, thought it not useless to devote his time to it. And it is reward enough for them that, if they solve it, they obtain access to hidden truths which they would otherwise hardly perceive.

Only now does Bernoulli explain his solution. We will present his main conceptual argument, leaving out his subsequent mathematical codification that he showed was a consequence of his method. He begins by bringing up Huyghens' discovery of the tauto-



Cycloid

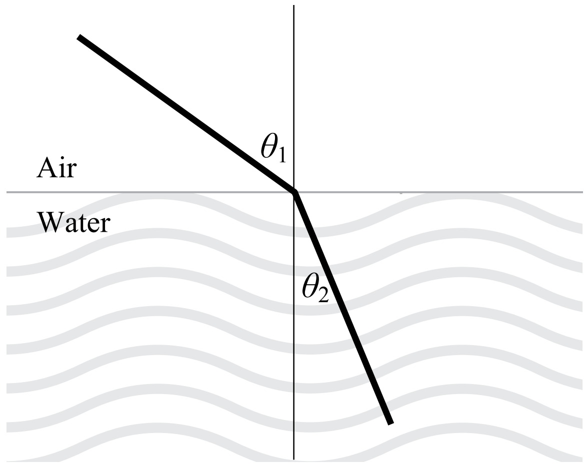
20. Tschirnhaus was a longtime collaborator of Leibniz who first published in Leibniz's *Acta* in 1683. L'Hospital was a serious student of Johann Bernoulli and was, twice, the vice-President of the French Academy of Sciences.

chrone ("tauto-chrone" or same time) nature of the cycloid. A cycloid is traced out when one rolls a circular clock one full cycle, whence a given point on the clock, e.g., the "6 o'clock" position, takes a path describing a cycloid.[21] Huyghens had developed the cycloid's curious property that a marble rolling down a cycloidal path reaches the bottom at the same time, regardless of how far up the path it began its descent from. Bernoulli announces: "But you will be petrified with astonishment when I say that precisely this cycloid, the tautochrone of Huygens is our required brachistochrone!" That should get his audience's attention. The cycloid combines within itself, not one, but two seemingly miraculous properties: Every point along the cycloid is, as it were, an equipotential point in a gravitational field, and the cycloid is also the least action pathway, displaying how gravity works.

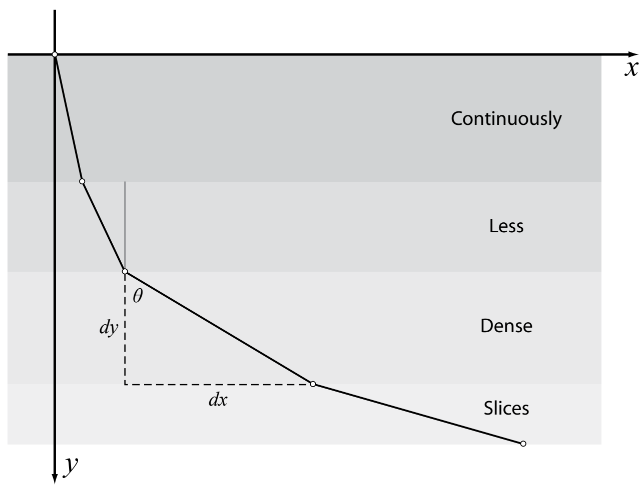
Light Meets Gravity

Next, Bernoulli announces: "I discovered a wonderful accordance between the curved orbit of a ray of light in a continuously varying medium and our brachistochrone curve." He proceeds to remind the reader of Fermat's principle of least action:

> [A] ray of light which passes from a rare into a dense medium [such as from air into water] is bent toward the normal in such a manner that the ray … traverses the path which is shortest in time. From this principle he shows that the sine of the angle of incidence and the sine of the angle of refraction are directly proportional to the rarities of the media, or to the reciprocals of the densities; that is, in the same ratio as the velocities with which the ray traverses the media. Later the most acute Leibniz in *Act. Erud.*, 1682, p. 185 et. Seq., and soon thereafter the celebrated Huygens in his treatise *de Lumine*, p. 40, proved in detail and justified by the most cogent arguments this same physical or rather metaphysical principle. . . .



Snell's Sine Law: The proportion of the sines of the two angles gives the proportion of the velocities, or the inverse of the proportion of the densities.



The path of the light ray going through many infinitesimally thin layers, each one less dense than the one above it. Bernoulli develops the direction of the curve from the dx and dy components of each infinitesimal triangle.

One sees a stick partly thrust into water as being bent, and the angle of the bending, or refraction, is related (via the sines of the two angles) to the relative densities of air and water. Bernoulli cites the works of Leibniz and Huyghens that he studied for his development of least action as a solid principle.

Bernoulli then proceeds to generalize Fermat's one layer of refraction by asking the reader to imagine "an infinite number of sheets … whose interstices are filled

21. Huyghens had responded to Blaise Pascal's 1658 challenge problems on the cycloid, and studied Pascal's 1659 *Roulettes*. Besides the curiosity of the tautochrone nature of the cycloid, Huyghens' mind found it significant that the cycloid's involute was yet another cycloid, whose evolute was the original cycloid. The singular involute/evolute quality of the cycloid led to Huyghens' unique design of a famous pendulum clock, which could keep time on a rolling ship—crucial for the ship's navigation by the stars.

with transparent material of rarity . . . decreasing according to a certain law. . . .” Fermat’s one action of refraction will now be applied continuously through each of the infinitely thin layers. Hence, by this construction, the light ray will travel according to the shortest time. And one may choose, in this construction, to have the rarity of the infinitely thin layers be specifically geared to the changes in velocity due to gravity. Hence, the two curves will be the same. The construction is based upon taking the least-action characteristic as primary, even in the smallest incremental steps. So, Bernoulli can conclude:

> For whether the increase in the velocity depends on the nature of the medium. . . as in the case of the ray of light, or whether one removes the medium, and supposes that the acceleration is produced by means of another agency but according to the same law, as in the case of gravity—since in both cases the curve is in the end supposed to be tra-

GUIDE FOR THE PERPLEXED

Metaphysics and Bernoulli’s Light-Gravity Solution

Metaphysics is not merely swapping unprovable speculative stories in college dorms. It refers to matters after or beyond the world of physics, that is, meta-physics, including such as the efficacy of ideas on the physical world, that is, the operations of the mind itself. Think through what Bernoulli did.

Huyghens’ tautochrone property wasn’t just a curiosity. If the cycloid really was the least action pathway of gravity, then any location along that pathway was going to be governed by the same characteristic property that the whole curve displayed. Any possible trip on such a special curve would have to share the same time!

Leibniz’s study of Fermat and of Pascal in the early 1670’s, under the guidance of Huyghens, led to his systematic development of metaphysical principles having demonstrable, causal relationships in the physical world. This is the hard work of science, not idle speculations nor glorifications of unknowable magical forces (such as Newton’s version of gravity). Those who are unwilling to climb into this more elevated world must also endure an alienated relationship with their own minds.

It was Leibniz who, for purposes of the general welfare, advised Bernoulli to lead with his metaphysical proof. Bernoulli generalized Fermat’s single case of refraction (that is, through a single change in density) to a continuously varying change in density, but always acting in a “least action” fashion. As such, he provided a physical model for unpacking the otherwise mysterious action-at-a-distance model of Newton’s gravity. Again:

> For whether the increase in the velocity depends on the nature of the medium . . . as in the case of the ray of light [moving through a progressively less dense medium], or whether one removes the medium, and supposed that the acceleration is produced by means of another agency but according to the same law, as in the case of gravity; since in both cases the curve is in the end supposed to be traversed in the shortest time, what hinders us from substituting the one in place of the other?

Think back. Bernoulli had boldly opened his solution with an analysis of the path that light would take as it progressed through a continuously less dense medium. The reader’s mind should be jarred, asking, “Wasn’t the problem about the path of something falling under its own weight?” Bernoulli develops Fermat’s work on the refraction of light moving from one medium into a different medium, where the light takes the pathway of the least time to accomplish the overall trip. Firmly grasping onto the characteristic of “least-time,” Bernoulli constructs the case where the minimal and continuous change in medium is ever-present. It serves as the analogue of the case where a body is falling toward a larger body (e.g., earth), with the gravitational impulse active at every increment along the way. This makes no sense to one ideologically wedded to empty space, and to the concept of “gravity” extending little farther than a mysterious action obeying an inverse-square formulation. And, indeed, Newton could make no sense of it.

versed in the shortest time, what hinders us from substituting the one in place of the other?

Though Fermat had come under attack by mechanists in his day for daring to employ a metaphysical principle such as "least action," Bernoulli showed how, by following this path from Fermat to Huyghens to Leibniz, truly marvelous results were derived—results unimaginable to mere mechanists. Bernoulli, at this point, gives the mathematical bookkeeping for his preceding argument. Then he provides a delightful dessert.

Dessert: The Coup de Grace

Following this tour de force, Bernoulli cannot resist adding a devastating dig at Newton, a coup de grace. Bernoulli admits, completely tongue in cheek, that we've derived the cycloid quite generally, but then adds, as a sort of burlesque, the completely unnecessary and trivial sequel... "We have yet to show how from a given point ... we can draw the ... cycloid, which passes through a second given point. This is easily accomplished as follows...." Then, without mentioning Newton's name, he inserts Newton's non-proof, showing how one can enlarge a cycloid! It turns out, Bernoulli shows, there was a use for Newton's demonstration... and, indeed, as stated, it was easy to accomplish the mission of making the cycloid the right size to accommodate the two points A and B. It was ridiculously easy, with emphasis on the ridicule. And that is Bernoulli's point. Bernoulli delivered his coup de grace to the ugly submission, by putting it in its proper place. Recall Figure 1 again.

Of course, for several centuries, commentators on the Brachistochrone Contest have simply missed the joke. At least in Hans Christian Andersen's tale, "The Emperor's New Clothes"—when the little child innocently observes, "But he hasn't got anything on"—everyone's self-deluding behavior is punctured.

VI. Flight Forward: 'By the Claw, the Lion Is Known'

Strap on your seatbelts. The story now goes ballistic. A month after the contest had ended, Basnage publishes the letter that Bernoulli had written to him back on March 30th. There Bernoulli had conveyed to Basnage that it was clear that Newton was the author of the anonymous submission: "We know indubitably that the author is the celebrated Mr. Newton; and, besides, it were enough to understand so by this sample, *ex ungue Leonem*." Bernoulli uses the expression, that from the claw, the lion (is known). From a look at what had been submitted, a lot is known about the person that submitted it. On April 3rd, a few days later, Bernoulli repeats this same formulation in writing to Leibniz. Leibniz had no trouble understanding Bernoulli, writing back, on April 15th, that the Newton submission was indeed "suspicious."

To state the obvious, no normal person would have taken the "claw" comment as a compliment. Rather, Bernoulli had called out Newton in issuing the January 1st leaflet, and he had received the response that the emperor indeed had no clothes on. Newton, the vaunted "Mr. Gravity," could not take the first step in unpacking how gravity works, nor how the calculus could aid in developing such physical investigations. From this simple episode, Bernoulli characterized the whole fraudulent approach of the Newton mathematizing project of the previous ten years.

The World Upside Down

Any reader can try a simple search engine experiment: Put in "Isaac Newton," "lion," and "claw," and you'll get the amazing result that the world has turned upside down. Bernoulli's phrase is universally taken as a great compliment to Newton! (And, of course, you will have to look a lot further to locate anyone who addresses Newton's actual submission.)[22] All you will get is some version of the fantastical claim that Leibniz and Bernoulli thought they could trap Newton, but the genius Newton showed them by his proof that he had the mental strength of a lion, that he was the most powerful thinker in the jungle. Two examples: First is a typical one (by L. T. More from 1931): "It is said that Bernoulli recognized the author from the sheer power and originality of the work...".

22. One looks far and wide for even these two modest exceptions: First, in 1810 Robert Woodhouse dismissed Newton's submission with the one-line cryptic comment: Newton "gave, without proof or the authority of his name, a method of describing the cycloid." (The rest of Woodhouse's 1810 "Treatise on Isoperimetrical Problems and the Calculus of Variations" was helpful in bringing a version of Leibniz's analysis back into England, and it served as an impetus for the revival of science in England by John Herschel and Charles Babbage.) Second, Newton's modern-day editor, D. T. Whiteside, amongst his voluminous commentary, slips in the phrase: "Newton's undemonstrated construction of the required curve." Yet, he provides no further elaboration of this point.

Second, Carl Sagan takes flight, in his 2011 *Cosmos*, with: "Before leaving for work the next morning, he had invented an entire new branch of mathematics called the calculus of variations [...and] used it to solve the brachistochrone problem... [T]he brilliance and originality of the work betrayed the identity of its author. When Bernoulli saw the solution, he commented, 'We recognize the lion by his claw.'" Perhaps he should have looked at Newton's submission before he leaped.

We can credit Sir David Brewster as the one who popularized this outrageous take on what Bernoulli wrote. (For Poe's war against Brewster, see p. 53.) Brewster, the British arbiter in the 19th Century for what would be counted as science, was at the core of this lionizing of Newton. His 1855 revised biography of Newton explained that:

> [A]lthough that [submission] of Newton was anonymous, yet Bernoulli recognized in it his powerful mind; 'tanquam', says he, 'ex ungue leonem', as the lion is known by his claw.... When the great geometer of Basle[23] saw the anonymous solution, he recognized the intellectual lion by the grandeur of his claw; and in their future contests on the fluxionary controversy, both he and Leibniz had reason to feel that the sovereign of the forest, though assailed by invisible marksmen, had neither lost a tooth nor broken a claw.[24]

Rather disconcerting—but Sir David Brewster, a student of the intelligence agent John Robison,[25] was in a position to know about Newton's behind-the-scenes activity in the "fluxionary controversy," and it seems that he took some vicarious pleasure, at the thought of the claw-and-tooth methods Newton would employ to savage Leibniz. Section VIII will cover the assault on Leibniz. First, we clean up the one last part of the story of Newton's submission.

VII. But, Didn't Newton Pick the Correct Multiple-Choice Answer?

Indeed, he did. Newton drew a cycloid, and not the other main suspect, the catenary.

Did this signify anything? Conceivably, but none of Newton's work papers on this contest exist, and there is no indication that Newton had any idea as to how to solve the problem, and every indication that he did not. We shall address the most likely scenario.

Bernoulli had been very clear the previous year that the solution to the challenge contest was a very well-known curve. When it came to rounding up the usual suspects, the catenary and the cycloid were the pre-eminent curves publicly treated by Roberval, Fermat, Pascal, Huyghens, Leibniz and Bernoulli in the previous decades. If one didn't have any other clue and had to back-engineer a solution, one would start with those two suspects. Everyone knows that, on a multiple-choice test, the advantage is that one may not know how to solve the problem, but one can look at the, typically, four possible solutions and work backwards.

No later than the previous summer and fall, two of Newton's collaborators, John Wallis and David Gregory, are known, by a paper trail, to have been working on the contest. They had studied both of the two most likely suspects, and were attempting to, literally, curve-fit them to the required specifications. Though Wallis was fascinated with the cycloid, he wrote to Gregory that, after months of effort, he was stumped.[26] David Gregory rather intelligently went back to the earlier (1691) Catenary Contest proposed by Jakob Bernoulli, where the three solutions were given by the two Bernoulli's and Leibniz.[27] He had pretty good reasons for

23. Bernoulli was at Groningen. It was Bernoulli's famous brother Jakob who was the geometer at Basle. Brewster means Johann Bernoulli, who, eight years later, did succeed his brother at Basle.

24. Sir David Brewster's 1855 *Memoirs of the Life, Writings, and Discoveries of Sir Isaac Newton*. Vol. II, page 192.

25. Of note, Sir David Brewster was a student of the Edinburgh intelligence agent, John Robison—the same one who worked so assiduously with his *Proofs of a Conspiracy* to poison the minds of Americans in the 1797/8 period of the Alien and Sedition Acts. The operation to ignore the positive mission of the United States of Washington and Hamilton, and to retreat to a world of choosing up sides—between the British Empire's version of law and order and the Jacobin French reactionary rage—was at the core of the factionalization of the republic of the United States and the cementing into place of turf-protecting political parties.

26. Wallis wrote up a history of the cycloid, interestingly tracing it to the work of Nicholas of Cusa, but it is appears that he was stumped as to how to proceed. See Wallis's "Concerning the Cycloid Known to Cardinal Cusanus, about the Year 1450," dated May 4, 1697 and published in the *Philosophical Transactions*.

27. Gregory published in the 1697 *Philosophical Transactions* his unsuccessful attempt to put Leibniz's solution for the catenary into

suspecting that this new 1697 contest would not be a repeat of the catenary.

'Dunned and Teezed by Foreigners'

Perhaps Newton was unaware of the efforts of his colleagues, but it is much more likely that he had been apprized of their efforts, and had also worked over the challenge contest himself. If so, evidently he met with frustration and buried whatever worksheets he had. It would appear that he and the others would have been content to remain silent when the December 31st deadline arrived. However, the extension of the contest until Easter, 1697, and, in particular, the January, 1697 personal delivery of the challenge to Newton's doorstep changed all that. Recall Newton's peevish: "I do not love to be printed upon every occasion much less to be dunned and teezed by foreigners about Mathematical things. . . ."

Hence, it is a decent possibility that the Wallis/Gregory/Newton group's efforts over the preceding half-year enabled them to narrow down the choices to make the cycloid the more likely candidate. Certainly, Gregory had done sufficient work on the catenary that might have convinced him that he had gone down the wrong path.

So, in sum, what we have is, first, that Newton makes the point that he didn't receive the direct challenge until January 29th, meaning that it took an abnormal 38 days after Bernoulli dispatched the challenge for him to see it. Next, Lord Montague, the head of the Royal Society, supposedly receives the solution on January 30th, but the normal reading of such received communications to the weekly Royal Society meetings is missed for the next couple of meetings. Further, their initial actions are not to send in the solution, but to publish, outside of the contest, an anonymous response to be "on the record." And, finally, Gregory works for weeks to produce an improved version, which evidently is not completed soon enough to send in for the contest, but is put into the *Philosophical Transactions*, also anonymously—as if by the same anonymous author of the previous month.

In this world of smoke and mirrors, it is perfectly possible, and eminently likely, that Lord Montague simply decided that Mr. Anonymous would be on record with the cycloid option, and if it worked out, then the association with Newton could be promulgated. But if the wrong multiple-choice selection had been made, deniability as to authorship was fully in play.

Newtonian fluxions. In 1698, Leibniz pointed out the failure in Gregory's derivation as due to the insufficiency of the fluxions, and suggested Gregory should discuss the matter with Newton. Newton refused.

VIII. The Assault upon Leibniz

The Montague/Newton faction did not take Bernoulli's advice to stop showing off and begin to learn from the proper solution to the gravity problem (and perhaps even from the gravity of the problem!). They neither investigated the provocative avenue of the coherences between light and gravity nor were they willing to take advantage of Leibnizian analytical techniques. Rather, in the immediate years after the May, 1697 publication of the Brachistochrone solution, there were various attempts to recast the various published solutions into the language of Newtonian fluxions.

A year and a half after the contest had ended, the British Royal Society published a somewhat confused version of Bernoulli's solution, done by one Richard Sault. In 1700, both David Gregory and John Craige worked out their versions of brachistochrone proofs. And in 1704, Craige's version was the model for Charles Hayes' textbook, *A Treatise of Fluxions*, where results from Bernoulli, Leibniz et al, were recast into Newtonian fluxions. But it was the figure closest to Newton, Fatio de Duillier, who worked hardest to extend Newton's mathematics into a proof.[28]

Newton's Favorite Fires the First Shot

Fatio published in 1699 a rather convoluted argument, one which Leibniz found to be "unnecessarily complicated" and "round-about". While his version of a proof was stillborn, bearing no fruitful results, it became infamous for Fatio's flight-forward assault upon Leibniz. He dared to charge Leibniz with being merely a "second inventor" of the calculus—this, just after the power and mastery of Leibniz's calculus had

28. Fatio had a complicated relationship with Newton, one that likely played a role in Newton's psychological breakdown of 1693. Otherwise, Fatio was notorious as a millenialist, one who thought that the world was coming to an end imminently. For Fatio, France's King Louis XIV was the anti-Christ marking such an event.

been publicly displayed, and Newton's publicly humiliated. Today, such a charge by Fatio is taken as received wisdom, a charge that must have some element of truth to it. However, at the time, it was a bolt out of the blue, done by a rather unstable character—but it proved to be the opening shot in the contrived 'Newton-Leibniz' priority dispute that played out from 1699 to 1716, Leibniz's last eighteen years.

The 1696/7 contest had already put an end to any ostensible scientific discussion from the Montague/Newton crowd. Nothing but legalistic and sophistical tricks ensued, degrading into outright fraud. The anti-Leibniz operation went into overdrive in 1711/12, when Leibniz was appointed to key positions in Russia and in the Austro-Hungarian Empire, and had key inroads into the next English government, and English history has never recovered.[29] However, the operation was launched in the wake of the Brachistochrone Contest of 1697.

One might recall that it was Newton himself who, in 1713, wrote the anonymously-issued official report of the British Royal Society and their supposedly neutral investigation by a responsible committee, into the hoked-up debate over who had first invented the calculus. Newton headed the committee and authored the report. It found that Leibniz was wrong and Newton was right. Newton was judge, jury and litigant. If one can prove how gravity works by simply drawing a cycloid, then what is there to stop one from winning all one's arguments by being the anonymous judge of one's own debates?[30]

Such behavior condemned 18th-century England to financial bubbles, to the tax-farming of colonies, and to expanded military deployments—making the American Revolution practically inevitable. The general welfare of a population really does depend upon pushing forward the frontiers of science and developing qualitative breakthroughs in modes of production. To turn one's back on such is to write the date of extinction upon that society.[31]

IX. Are Light and Space Alive?

They sure seem to act that way. Light bends toward the more dense medium so as to minimize the overall time of its action. Substance is so distributed as to structure spatial relations, so that parts act on other parts in a way that we label "gravity."

The implications would await the further developments of Bernhard Riemann and Alfred Einstein; however, for Leibniz and the Bernoullis, the activity of light and the substance of mass were not two fundamentally distinct entities to be understood in their external actions upon each other. That light bends toward (not away from) the more dense medium speaks to a non-negligible substantiality of light. That the topological arrangement of mass has, inescapably, a dynamic potential wrapped up in it (e.g., Leibniz's "vis viva") speaks to a vibrant quality of substantiality. A simplistic world of dead, inert pieces of matter being subjected to collisions with other such, certainly qualifies as a simple world, one amenable to simpler quantification - but not one that ever did or could exist.

Rather, the provocative and sometimes paradoxical aspects of the "self-reflexivity" associated with humans (e.g., looking over one's own shoulder; deliberation; acting based upon an intention; etc.) have a reflection in non-human animal life, in plant life, and even in the so-called inorganic realm of substance. (Or, in Vladimir Vernadsky's terms, the noetic organizes the organic, which organizes the inorganic.) This is what unites a body falling under its own weight, and a light ray refracting through a consistently-varying medium. The body participates in re-structuring the space through which it moves, and the light organizes the medium through which it moves.

How Human Are Light and Space?

Light does not self-consciously deliberate, with an active dialogue in its head, pausing to reflect—as you the reader have been doing. However, it does originate from a sun-powered solar system, and it does travel through a changing medium according to a least-action principle—not because it has an on-board computer doing the calculations, but because activity and substance are fundamentally inter-related; and the conjoined two, as Leibniz explained it, would simply never have a reason to waste time, lolly-gagging. Having no reason to do so, they would go about their mission in a direct, least action fashion.

29. This author's account may be found at: https://www.schillerinstitute.org/educ/hist/eiw_this_week/2016/0208-leibnizs_kepler_project.html

30. Or, when eyewitness accounts are brought from Syria to the United Nations to counter blatant lies, isn't the proper behavior for a British imperialist to simply walk out and refuse to hear the testimony?

31. A somewhat ironic point: In 1704, Newton calculated the world would end in 356 years. (Before you go sell the farm, remember, Newton has been known to engage in frauds!)

While light seems to know where it needs to end up, and seems to demonstrate what we would identify as an intention, that appearance involves a confusion rooted in our own mythology of our own self-consciousness and our own intentional activity. The light ray was never really an individual thing standing around waiting for something to do. It was always bound up in a bigger process. Too often we tend to think of ourselves as a "Robinson Crusoe" on the outside of the universe looking in. But it is when a human solves the scientific problem of locating his or her mission in life, locates the reason for having been born, that intention is properly located. And this self-reflexive activity occurs as part and parcel of the individual coming to terms with one's Maker, with one's mortality, and with one's admiration and love for the Creator's creation, including one's fellow man. Indeed, the way human intention plays out is at the core of scientific method. It is not about getting a life counselor and an investment planner, assumedly to manage the time left on the ticking clock.


A ball rolling down the pictured cycloid curve will always arrive at the bottom before a ball rolling down a straight path.

The family of transcendental curves that Leibniz and his circle developed in the early 1690's originated from such considerations. The catenary—a chain suspended at each end and pulled upon by gravity—has a specific shape, unique to the mapping of one's location within a topological distribution of substances. Its shape is as unique as its location in space! The tautochrone displays equipotential pathways through non-empty space. The brachistochrone, or least-time curve, speaks to how action occurs—as Bernoulli emphasized, be it gravitational or the energetic of light transmission. And the golden-mean spiral[32] is a hallmark of a world created, whereby the creations are a lawful reflection of the Creator—where man is made in the image of God. So, light did not *have* to refract toward substance, and creations did not *have* to be made in the image of their Creator—but that would not have been good. And God is good.

32. In brief, the simpler golden section is the specific action (sectioning) that divides a length so that the larger portion to the smaller portion is in the same relationship as the whole length was to the larger portion. As such, the characteristic action embeds the whole-to-part relationship into the larger-part-to-smaller-part relationship. The relationship of the created parts reflects the way the Creator went about creating. Study of that relationship brings one closer to the Creator.

X. If God Is Good, Why Do Lies Last So Long?

Abraham Lincoln famously declared that one can fool some of the people all the time, and all of the people some of the time, but one cannot fool all the people all the time. He wasn't making a point about polls or numbers. The point is that there is indeed a reality principle, where, below the level of most people's perception, certain things have to be successfully accomplished, lest no one is around to debate the point. There is no world where all the people have been fooled all the time.

For his inauguration in March, 1865, Abraham Lincoln chose to address Americans—as victory was in their grasp after four years of bloody insurrection—not on how much they had sacrificed and accomplished, but how they must come to a better understanding of their Creator. There would come moments when they would wonder what it was all about, and whether it was worth it, and why a good God would put them through all that suffering. However, they must not allow into their hearts the notion that God was uncaring or mean. For the violence of the war to not continue its destruction into peacetime, the population had to become unprecedentedly better people.

Lincoln put to his audience that, if it were not four years of blood to pay the debt, but two-hundred and fifty, then that was the measure of what it took to expiate the sin of slavery; and that God knew a type of measurement that was of a higher species than most other measuring, and formation of judgments, that people do. The suggestion was that people should struggle to get inside the Creator's mind and change themselves in a way that would otherwise have been deemed impossible. Stay the same, and your loved ones would have died in vain. It was a hard speech.

British Empire Lies Today

With the world on the verge of growing up, of maturing beyond "dog-eat-dog" geopolitical scheming, the type of lying coming out of imperial ideologues may worry people, it may anger or even enrage people, but it is a stage of lying and bluster of a cornered beast. Since China has recently committed to taking the lead in ending geopolitical gamesmanship and to offering countries long-term and infrastructure-driven development, the lying and blustering political habits of the recent fifty years, have been undercut. The Wizard of Oz really is rather pathetic.

The only problem with three centuries of obsessive blindness as to what Newton did is that our civilization has been too scared to laugh. The fellow really did commit an outrageous piece of buffoonery. If the Creator has allowed obsessive blocking on the joyful capacity of creative mentation to linger for three centuries, then the Creator also allowed for healthy laughter to relax humans and allow them to move forward—to move forward as a transformed population, one having formed a long-overdue, passionate and sustained commitment to wipe out poverty, hunger and disease, and to bring the genius out of every precious newborn.

Newton's buffoonery, or the desperation today of the likes of MI6's Richard Dearlove, are jokes in God's universe. While one should not be needlessly cruel to the pathetic, still it would be worse than impolite not to laugh at God's jokes. God tells jokes for a reason. And since it is vital that we don't waste the evils of the past by a failure to transform ourselves appropriately today, some healthy humor, in recognition of what we will never submit to again, is therapeutic and probably necessary.

Edgar Allan Poe's War Against Brewster: No More Creeping and Crawling

Sir David Brewster was the chief promoter of Isaac Newton in the first half of the 19th Century and the main public figure for the British Empire's posture on science. Edgar Allan Poe, the American poet, used Brewster's posturings to push Americans toward a powerful conception of science and of mind. Here, we (1) reveal Brewster's method in terms of his attempted defense of Newton's sanity; (2) compare Brewster's sophistries with Newton's actual words; and then (3) show Poe's exposure of this method in his essay, "Maelzel's Chess Player."

I. Brewster's Humbuggery

Newton's ridiculous submission in the 1697 brachistochrone contest was recognized by Johann Bernoulli, the designer of the contest, as symptomatic of something very wrong with Newton's whole approach to actual science. Newton's submission was done anonymously, but Bernoulli employed the phrase "from the claw, the lion is known" to encapsulate the bizarre submission. Sir David Brewster's 1831 biography of Newton is the prime source for the bizarre interpretation, whereby Bernoulli's apt characterization actually meant that Bernoulli had been overwhelmed by the power and genius of Newton's submission.

The larger context of Brewster's biography was perhaps equally bizarre. It opens with his announcement that it was his "sacred duty" to both England and Christianity to defend Newton.

Brewster had been provoked by an inclusion of a 1694 report by Huyghens (printed in 1822 biography of Newton by the French scientist, Biot) that Newton had endured a period of insanity but fortunately was in recovery.[1] Though this had been known at the time by

1. Huyghens: "On the 29th May, 1694, M. Colin, a Scotsman, informed me that eighteen months ago the illustrious geometer, Isaac Newton, had become insane... When he came to the Archbishop of Cambridge, he made some observations which indicated an alienation of mind." He has "so far recovered his health that he began to understand the Principia." (The Archbishop was John Tillotson, husband of Cromwell's

Lord Montague and John Locke and others of Newton's circle, Brewster pretends that no one in England ever had even a clue that Newton suffered such a malady.[2] He claimed that he would present the true story of "that temporary indisposition which, from the view that has been taken of it by foreign philosophers, has been the occasion of such deep distress to the friends of science and religion."

Sir David Brewster

What Brewster meant by such is that he accepted the patronage of one Lord Braybrooke to go public with components of the private "Newton" file, attempting to put a different spin on the recently-surfaced Huyghens' report.[3] For that purpose, Braybrooke gave Brewster access to the pertinent correspondence of Newton, John Locke, and Samuel Pepys, kept in reserve all these years. Brewster argued that Huyghens must be wrong because Brewster can cite parts of the eighteen-month period prior to Huyghens' May 29, 1694 report, where Newton appears sane. However, in his concern to present examples of sanity, Brewster includes incidents a year earlier than what Huyghens reported, and uses that to show that Huyghens could not have been right. Further, the evidence he does present only multiplies the confusion as it is of varying degrees of relevancy and accuracy. His method seems to be one of wearing down the opposition.

II. The Facts in the Case of Newton's 'Alienation of Mind'

Simply compare what Huyghens related (see footnote 1) with what Brewster submitted from Newton's previously-unknown letters from 1693. Here are two examples. Newton lashed out against Samuel Pepys, the Secretary to the Admiralty, who had worked to reward Newton with a post in the new government: "…[F]or I am extremely troubled at the embroilment I am in, and have neither ate nor slept well this twelvemonth, nor have my former consistency of mind. I never designed to get anything by your interest, nor by King James's favour, but am now sensible that I must withdraw from your acquaintance, and see neither you nor the rest of my friends any more. . . ." Huyghens had indicated November, 1692, as the approximate date of Newton's mental problems; Newton, in September, 1693, references a difficult "twelvemonth" period—roughly a variance of two months in the time of onset.

To John Locke, the man who would eventually succeed in arranging for Newton's post at the Royal Mint, Newton wrote: "Being of opinion that you endeavoured to embroil me with women, and by other means, I was so much affected with it, as that when one told me you were sickly and would not live, I answered, 'twere better if you were dead." This, from mid-September 1693, was just after Newton had begun to recover.

So, there is little doubt that, from the winter of 1692 until September 1693, Newton suffered his difficulties, climaxing in August and early September. Without attempting to explain Newton's dismay over embroilments with women, it seems that one contributing factor was Newton's anxiety over an appointment from the King. Brewster both produced the letters and failed to impugn Newton's testimony! Regardless, Brewster is able to summarize: "In reviewing the details which we have given . . . from the beginning of 1692 till 1695, it is impossible to draw any other conclusion than that he possessed a sound mind."

Such humbuggery—or to use Poe's word, cant—was little to Poe's liking.

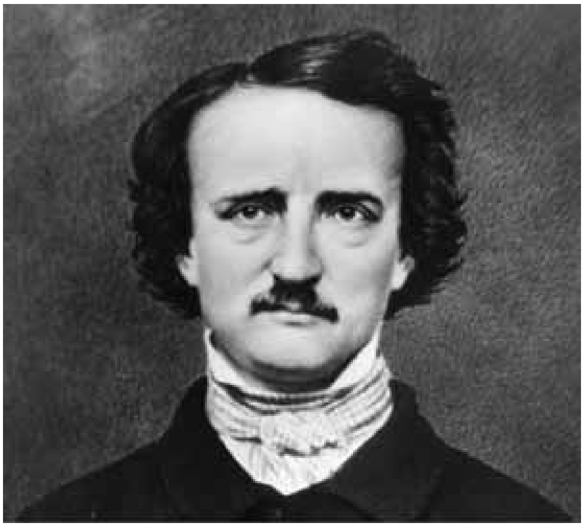
niece and politically very close to Lord and Lady Russell, through whom, he became closely tied to the new rulers, William and Mary.)

2. Brewster: "…[T]his incident has been for more than a century unknown to his own countrymen, and has been accidentally brought to light by the examination of the manuscripts of Huygens."

3. Lord Braybrooke was the grandson of both Prime Minister George Grenville and General Charles Cornwallis. Grenville authored the infamous Stamp Act. After the "world turned upside down" on Cornwallis at Yorktown, Virginia in 1781, he extracted revenge as Military Governor in India and then Ireland.

III. Poe's Exposure of Brewster's Method

Edgar Allan Poe not only was brilliant at taking the air out of the sails of the British Empire's epistemological frauds, but he exploited the frauds so as to make Americans better. The frauds were aimed at the weaknesses and undeveloped aspects of American culture; hence, they were efficient instruments for confronting Americans on matters of continued mental subservience to the British Empire, long after the Revolutionary War had been won.



Edgar Allan Poe

Memorable is Poe's satirical treatment of both the deductive method of Aries Tottle and his "greatest disciples… one Nueclid and one Can't," and the inductive method of "one Hog," or Francis Bacon, whose scheme was tied "altogether to Sensation… The savants now maintained that the Aristotelean and Baconian roads were the sole possible avenues to knowledge… two preposterous paths—the one of creeping and the one of crawling—which they have dared to confine the Soul that loves nothing so well as to soar…"[4] At the center of the deductive/inductive ideology was the British Association for the Advancement of Science, headed by Sir David Brewster.

Poe's 1836 essay, "Maelzel's Chess Player,"[5] took on Brewster's method, one whose appeal to commonsensical matters primarily dulled the senses as to reality. Poe had read Brewster's 1835 *Letters on Natural Magic*, where Brewster had promulgated a non-solution of the puzzle of a chess automaton, judging it to be a "thorough and satisfactory explanation." As in the brachistochrone contest, the answer was correct, though it was based on fallacious reasoning. Poe wrote that it suffered from "a course of reasoning exceedingly unphilosophical," though it "has contrived to blunder upon a plausible solution."

In brief, audiences in Europe and America had been challenged by the puzzle of what appeared to be a chess-playing machine. Brewster's "thorough and satisfactory explanation" simply showed a way that a human could have been hidden inside the machine. Plenty of diagrams were provided as to what panel could slide where and in what order. Poe agreed that a human was, indeed, inside the apparatus, but seized upon Brewster's humbuggery—the conceit, that showing one of many possible sequences of mechanical manipulations to hide a human in the apparatus, constituted a proof. Rather, for Poe, it was merely a demonstration of the possibility of doing so. Poe proceeded to display an actual solution by relentlessly honing in on the subtle but distinctively human characteristics that could be detected in the operation of the chess automaton.[6] Poe would do no differently with today's proponents of artificial intelligence who are confused that machines somehow will replace the human mind.

Poe's treatment of Brewster's problem with the chess-automaton problem mirrored Brewster's problem with Newton's breakdown. And even though Brewster was never quite as ridiculous as Newton's submission, Poe's treatment of Brewster also reflected Bernoulli's treatment of Newton.[7] By the claw of Brewster's treatment of the case of Newton's mental wonderings, one may know the method of British cultural warfare against science.

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4. "Mellonta Tauta" was published in 1849, Poe's last year.

5. J. N. Maelzel, the designer of the metronome and of a hearing apparatus for Beethoven, toured the United States in 1825 with his chess automaton, one designed by Wolfgang von Kempelen. Poe witnessed the display several times.

6. The best, and more complete, account of this matter is to be found in "Edgar Allan Poe: The Lost Soul of America" by the Poe expert, Allen Salisbury. "Fidelio", Vol. XV, 2006. http://schillerinstitute.org/fid_02-06/2006/061 -2_Poe_Allen-S.html

7. Much more could be said about Poe's grasp of epistemology and science. Here, merely note: Poe promoted the first American biography of Gottfried Leibniz; and he also praised, with considerable insight, the project to finally publish the complete works of Johannes Kepler—especially since a "singular fatality seems, indeed, not only to have accompanied that wonderful man through life, but to have attached itself even to his works after death."