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Senior Editor's Note

Stephen H. Daniel

Ever since Berkeley started publishing his ideas in the first decade of the 18th century, commentators and critics have found outlets for discussing his life and doctrines. But in 1977 Ned Furlong and David Berman recognized a need to communicate information about not only the latest news and publications on Berkeley scholarship but also short notes relating to his life and thought. So in October of that year, with the support of the Department of Philosophy at Trinity College Dublin and the Royal Irish Academy, they published the first issue of the *Berkeley Newsletter*, a modest 12-page pamphlet distributed to a handful of scholars in Europe and North America.

The *Newsletter* appeared annually in its first nine years and every two years from 1987 to 1998 (when it ceased publication with Issue #15). In 2005 Bertil Belfrage spearheaded an effort to resurrect the *Newsletter*; and with the help of Silvia Parigi, Laurent Jaffro, Tom Stoneham, and especially Marc Hight and Hampden-Sydney College in Virginia, the *Newsletter* appeared as Issue #16 in the online format you now see before you.

After reestablishing the *Newsletter* and guiding it through two issues, Bertil stepped down as senior editor last year. During those two years, it became evident that an online journal could accommodate full-length research articles as well as the notes, reviews, and announcements that characterized the newsletter. We have decided, therefore, to change the name of the journal from the *Berkeley Newsletter* to *Berkeley Studies* (Issue #18) to reflect its expanded mission. We will continue to provide updated bibliographic entries and news items; but we also invite those interested in Berkeley scholarship to visit the website of the International Berkeley Society (<http://georgeberkeley.tamu.edu/>) and to consult the IBS publication *Berkeley Briefs* for information about events relating to the study of Berkeley.

As in other professional journals, articles and notes published in *Berkeley Studies* are peer reviewed and listed in indexing sources (e.g., *The Philosophers Index*, the *International Philosophical Bibliography*).

One final note: some readers might remember that the IBS issued a pamphlet in 1988 entitled *Berkeley Studies*. It contained an essay by J. V. Luce about his father, A. A. Luce, and was intended by its editors, Ray Houghton and David Berman, to be the first of a series of pamphlets to be distributed to members of the IBS. However, no subsequent issues appeared. Ray and David have graciously given us permission to use that title.

Texas A&M University, College Station
sdaniel@philosophy.tamu.edu

Algebraic Money: Berkeley's Philosophy of Mathematics and Money

C. George Caffentzis

Our spinning school is in a thriving way. The children begin to find a pleasure in being paid in hard money.¹

In the early 1730s George Berkeley began to explore the conceptual field between ideas and spirits that he previously claimed to be empty. In this field he found a rich set of concepts including “notions,” “principles,” “beliefs,” “opinions,” and even “prejudices.” Elsewhere I have referred to this phase in Berkeley's thought as his “second conceptual revolution.”² I believe that it was motivated by his increasing need to develop a language to discuss the social, moral and theological concerns vital to him and his circle.

This second conceptual revolution made possible two of his most important contributions to 18th century thought: *The Analyst* (1734) and *The Querist* (1735-37). Even though they were written almost simultaneously, these texts are rarely discussed together, since the former is categorized as a critique of the foundations of the calculus, while the latter is taken a tract advocating the development of a specie-less economy in Ireland. Using new textual and contextual evidence, however, I will show with that these two texts have a common basis in Berkeley's second conceptual revolution, in that the rejection of intrinsic values (either epistemic or monetary) and the revaluation of notions, principles, and prejudices are crucial to the critique of both Newtonian mathematics in *The Analyst* and Newtonian monetary theory and policy in *The Querist*.

Specifically, I will argue that Berkeley's famous demonstration of the absurdities of Newton's method of fluxions devalued geometric reasoning and gave a new pride of place to algebraic reasoning. On the basis of this revaluation in mathematics, Berkeley more confidently undermined the concept of intrinsic monetary value and suggested the development of a monetary system based on “tickets, tokens and counters” (what I call “algebraic money”).

The issues posed by the transition from a specie-based to a specie-less currency were clearly some of the most important and controversial in the Age of Enlightenment. Berkeley's contributions to understanding the significance and feasibility of such a

¹ George Berkeley to Thomas Prior, 5 March 1737, in *The Works of George Berkeley*, ed. A. A. Luce and T. E. Jessop (London: Thomas Nelson, 1948-57), 8: 245. Hereafter: *Works*.

² Constantine George Caffentzis, *Exciting the Industry of Mankind: George Berkeley's Philosophy of Money* (Dordrecht: Kluwer, 2000), 180, 250-81.

transition and its benefits for Ireland certainly add support the claim that he was “the most engaging and useful man in Ireland in the eighteenth century.”

I. *The Analyst* and *The Querist* as Products of Berkeley’s “Second Conceptual Revolution”

In 1734 and 1735 George Berkeley began a new phase in his ecclesiastic career by becoming the Bishop of Cloyne. In those years, he also wrote and published (with the help of friends like Samuel Madden, Thomas Prior, and Lord Percival) two important pamphlets, *The Analyst* and *The Querist*. One dealt with mathematics and the other with money, but both had profound consequences on their respective fields and are often cited in histories of mathematics and economics. They are, however, rarely examined comparatively. This lacuna in the literature on Berkeley’s writings is strange for two reasons.

First, these two works are products of an important moment in Berkeley’s conceptual creativity (his “second conceptual revolution”) and in the development of his political and social sensibilities. One would be surprised, for example, that such a politically aware figure like Berkeley, who for almost a decade lobbied Parliament and the Queen in a failed effort to fund his utopian multi-racial college in the Bermudas, did not recognize that *The Analyst* and *The Querist* put into question the work of the Whig establishment’s intellectual centerpiece, Isaac Newton—both as a mathematician (in his role as “the Great Author” of the method of fluxions) and as the Master of the Mint (in his role as an originator of the gold standard). But what for Berkeley might have appeared as a seamless critical connection between these two works has not been noticed in a commentary literature that still seems to be ruled by disciplinary rubrics.

Second, there is a long and insightful interpretive tradition that has connected changes in mathematical thought with transformations in monetary reality (and vice versa). Participants in this tradition include the founders of modern social thought like Karl Marx and Georg Simmel as well as their more recent heirs such as Alfred Sohn-Rethel and Joel Kaye.³ The claim that money stimulated the mathematization of the social (and natural) world, and that mathematics makes possible the monetarization of the social (and natural) world is, of course, an essential theme in the philosophy of money. Adherents of this interpretive tradition would immediately suspect that there would be significant intertextual transformations between *The Analyst* and *The Querist* worth noting. And that is what I highlight here.

After some general comments on these themes, I will provide an important example of how *The Analyst* and *The Querist* are related. I argue that Berkeley’s critique of the

³ Cf. Georg Simmel, *The Philosophy of Money*, trans. Tom Bottomore and David Frisby (London: Routledge & Kegan Paul, 1978); Alfred Sohn-Rethel, *Intellectual and Manual Labour: A Critique of Epistemology* (London: Macmillan Press, 1978); and Joel Kaye, *Economy and Nature in the Fourteenth Century: Money, Market Exchange, and the Emergence of Scientific Thought* (Cambridge: Cambridge University Press, 1998).

application of geometric representation to the defense of “analysis” and his allied reevaluation of algebraic representation in *The Analyst* are implicated in and support the conception of money developed in *The Querist*.

Of course, the fact that Berkeley wrote *The Analyst* and *The Querist* at around the same time does not automatically justify treating them comparatively. But other evidence, both contextual and textual, supports the hypothesis that both of these works constitute elements of a common project. In this section I examine two pieces of this evidence: (a) the importance of “notions” in the development of Berkeley’s philosophy in the 1730s, including in both *The Analyst* and *The Querist*; and (b) the identity of the antagonists addressed in both texts: infidel mathematicians (e.g., the Royal Astronomer and Savilian Professor of Geometry, Edmond Halley), followers of Newton, libertines, and atheists.

Regarding Berkeley’s introduction of his doctrine of notions, it is useful to recognize how he was something of a philosophical prodigy, and he paid for it. He published major (and minor) works on mathematics, vision, and philosophy between his 22nd (1707) and 28th (1713) years that clearly identified him politically as a Tory and intellectually as a clever but harsh critic of materialism, libertinism, and atheism. His critique of these tendencies was based on the dichotomy he drew between ideas and spirits. Ideas were passive and detached, while spirits were active, creative, and capable, among other things, of making relations among ideas. Most important, one could neither have ideas about spirits nor describe spirits and their operations (e.g., willing, loving, hating) using words that refer to ideas. This limitation, however, was needed in order to get the quick results he desired—namely, “proof” of the inconceivability of unperceived things or objects and “proof” of the contradictory character of matter.⁴

However, just as Berkeley had to pay for his early identification with the Harley–St. John Tory regime (1710–1714) by spending the rest of his life under the cloud of “Jacobitism,” he also later had to deal with puzzling aspects of his initially successful philosophic program. Given the constraints of the idea/spirit dichotomy, he could not carry on a legitimate discourse concerning the life of spirits *unless* he found an appropriate referent for the part of language that is normally taken to refer to spirits and their operations, including their relation-making ability and products. To do this he introduced a specific term of art, “notion,” to distinguish it from “idea.” Previously he often used “notion” as synonymous with “idea,” but with the revision of the *Principles* and *Dialogues* in 1734, he granted that though he had no *idea* of the words *will*, *soul*, and *spirit*: “we have some

⁴ An early “proof” of the falsehood of “the opinion strangely prevailing amongst men, that houses, mountains, rivers and in a word all sensible objects have an existence natural or real, distinct from their being perceived by the understanding” is achieved in Berkeley’s *Treatise on the Principles of Human Knowledge*, sec. 4. See George Berkeley, *Philosophical Works Including the Works on Vision*, ed. Michael R. Ayers (London: Everyman, 1993), 90. [Hereafter: PHK and section number; or in the case of the *Principles* Introduction, PHK IN section.]

notion of soul, spirit, and the operations of the mind, such as willing, loving, hating, in as much as we know or understand the meaning of these words” (PHK 27).⁵

This admission of a capacity of words to signify non-ideas in a meaningful way had many positive (and a few negative) consequences for Berkeley. Its primary benefit was that it made it possible to carry on sophisticated discourse about the “soul, spirit, and the operations of the mind” consistently—not a trivial detail for a bishop whose job was to minister to such souls! But it also confronted him with a challenge of *policing* the range of notional entities that were in their nature unimaginable.

When he was dealing with notions he could not with confidence use his old critical experimental technique of claiming that, since he had no idea of x and doubted whether anyone else did, x-talk was illegitimate. This “subjective empiricist” technique worked splendidly for a critique of abstract ideas.⁶ But such a test could not apply to notions, since they cannot be experienced or perceived in the same way as ideas. Accordingly, the act of willing and its actor (which one has notions about) are literally un-*imagine-able*. Without such an introspective test (i.e., either I *have* that idea or I don’t), how can one set the bar on the existence of notions, including the fluxion?

Toward the end of *The Analyst* Berkeley reveals that, “Of a long time I have suspected that these modern analytics were not scientific, and gave some hints thereof to the public twenty-five years ago.”⁷ But his older 1710 test for the existence of ideas—“if therefore I cannot perceive innumerable parts in any finite extension that I consider, it is certain they are not contained in it”—does not work for notions in 1734, since being perceived is not a criterion of their existence (PHK 124). Indeed, to have perceived a notion (in the technical sense) is in itself a contradiction!

During Berkeley’s “second conceptual revolution,” notions become more central to his thought, and *The Analyst* and *The Querist* share his concerns about them. In *The Analyst* Berkeley is concerned about the use of notional terminology to mask logical and

⁵ Another lengthy 1734 addition to the *Principles* that expands on this point is: “We may not I think strictly be said to have an idea of an active being, or of an action, although we may be said to have a notion of them. I have some knowledge or notion of my mind and its acts about ideas, inasmuch as I know or understand what is meant by those words. What I know, that I have some notion of. . . . It is also to be remarked, that all relations including an act of the mind, we cannot so properly said to have an idea, but rather a notion of the relations and habitudes between things” (PHK 142). But I should point out that Berkeley never completely standardized the technical distinction between ideas and notions into a strict linguistic dichotomy in his work. He often used terms like “idea or notion” (for example, “of Extension prior to Motion” in *Querist* 12, and he used the phrase “true Idea of money” in *The Querist* to refer to what I have called his “notional” conception of money. [Citations from *The Querist* (by section) are taken from *Bishop Berkeley’s “Querist” in Historical Perspective*, ed. Joseph Johnston (Dundalk, Ireland: Dundalgan Press, 1970).] For an excellent discussion of Berkeley’s doctrine of notions, see Daniel E. Flage, *Berkeley’s Doctrine of Notions: A Reconstruction based on His Theory of Meaning* (New York: St. Martin’s Press, 1987).

⁶ See David Berman, *Berkeley: Experimental Philosophy* (New York: Routledge, 1999), 5-10.

⁷ George Berkeley, *The Analyst*, sec. 50, in *Works*, 4: 95. Hereafter: *Analyst* section number.

conceptual absurdities. He uses the term “notion” often in the text and he explicitly categorizes the suspect fluxion as a notion (cf. *Analyst* 10, 38–40). Consequently, one can see *The Analyst* as an attempt to *police* the notion of “notion” in mathematics.

In contrast, in *The Querist* “notion” is utilized as the intellectual basis of money, in that the crucial aspect of money is not that it truly signifies some idea (e.g., an ounce of gold), but that it *excites* the players in the monetary game to industry, that is, to work and to invest productively. As Berkeley rhetorically queries:

Whether it be not the opinion or will of the people, exciting them to industry, that truly enricheth a nation? And whether this doth not principally depend on the means for counting, transferring, and preserving power, that is, property of all kinds?
(*Querist* 31)

As a consequence, the key issues concerning money involve will, action and power; all of these are fundamentally notional entities. Thus the truth of monetary signs is not, as Locke would have it, whether coins accurately contain the metal they claim on their face.⁸ As Berkeley sees it, in the realm of money the distinction between “real” and the “notional” is not crucial:

Whether the opinion of men, and their industry consequent thereupon, be not the true wealth of Holland and not the silver supposed to be deposited in the Bank at Amsterdam? (*Querist* 44)

Whether there is in truth any such treasure lying dead? And whether it be of great consequence to the public that it should be real rather than notional? (*Querist* 45)

But the concerns generated by his notional conception of money made Berkeley clarify to his readers the need for precautions against abuse that would be largely irrelevant when dealing with a specie-dominated money. As I have expressed it elsewhere, readers might have argued with some justice that “the *Querist*’s enlightened liberation from the superstitious magic of Gold and Silver opened up so many possibilities for arbitrary, willful manipulation of the currency that it was best to stay with the old, chaotic, but relatively abuse-proof system.”⁹ Berkeley had to assure his readers that his National Bank would be designed to effectively *police* the notional character of money and a large part of *The Querist* is devoted exactly to describing mechanisms for the task.

In this way, both *The Analyst* and *The Querist* evince their participation in the increasing importance of notional entities in Berkeley’s work at the time. But there are other commonalities worth noting, most obviously of which is an overlap in the open and hidden antagonists of both texts. Antagonists were very important for Berkeley. In this regard, his temperament can be deceptive. By all accounts he was a sweet, calm and welcoming person. As an intellect, however, he was polemical. His work is often

⁸ See Constantine George Caffentzis, *Clipped Coins, Abused Words and Civil Government: John Locke’s Philosophy of Money* (New York: Autonomedia, 1989).

⁹ Caffentzis, *Exciting the Industry*, 299.

conceived and produced in the context of bitter ideological struggle. This disposition cost him much, including the most prized project of all, the multi-racial St. Paul's College in the Bermudas. During most of his productive life, his "extremist" texts inspired antagonism and suspicion in a Whig-dominated government. Moreover, in this struggle, he "took no prisoners." In fact, he was positively draconian when it came to imagining punishments for his enemies, the libertines, atheists, and blasphemers.¹⁰

Consequently, in Berkeley studies it is important to "know the enemy," although it is often not easy to "name names." Berkeley believed that he and his Church lived through perilous times and faced many mortal enemies (whom he was often loath to name). Certainly these enemies would include the late 17th century Whig Junto in London that lived on and triumphed in the more than twenty years of the Robinocracy. There was also a powerful opposition in Ireland among the gentry whose representatives in the Irish Commons had voted to stop paying the agistment tithe (a tithe on cattle) to the Anglican Church of Ireland in 1734. Berkeley believed that libertines were agitating against paying tithes and gave ideological support to the tithe revolt.¹¹

However, the intellectual figure who stands out as Berkeley's antagonist in both *The Analyst* and *The Querist* is Newton. Newton was an important part of the Whig intelligentsia, and he led the chief public organs of mathematics and money, the Royal Society and the Royal Mint, for the first quarter of the 18th century. Moreover, he was the "inventor" of the method of fluxions and the "inaugurator" of the gold standard.¹² Of course, in *The Analyst* Newton is referred to not as the living "mathematical infidel" addressed in the text (after all Newton had been dead for seven years by the time of publication), but as "the Great Author" of the notion of the fluxion.¹³ In *The Querist*

¹⁰ See, for example, the hair-raising deserts he recommended for them in the 1721 *Essay Towards Preventing the Ruin of Great Britain* and the 1737 *Discourse Addressed to Magistrates and Men in Authority*.

¹¹ See Caffentzis, *Exciting the Industry*, 119-24.

¹² *Ibid.*, 358.

¹³ Berkeley considered Edmond Halley an enemy and an acceptable object of odium (if not necessarily *odium theologicum*). Halley was a life-long ally of Newton's and held many prestigious posts in post-Settlement Britain. He was the Royal Astronomer from 1720 until his death, he was appointed Savilian professor of geometry in Oxford in 1704, and had been an official at the mint at Chester during the Great Recoinage of 1696. Here was a man who blended mathematics and money almost as deeply as Newton did. He was traditionally assigned the role of "infidel mathematician" in *The Analyst*. However, in their Introduction to *The Cambridge Companion to Newton* [(Cambridge: Cambridge University Press, 2003), 22], I. Bernard Cohen and George E. Smith claim that "the target of Berkeley's attack was later identified as the physician Samuel Garth." This is hardly likely, since Berkeley addresses the infidel mathematician as a living personage, and Samuel Garth had died in 1719. Halley was still very much alive in 1734 and was by all accounts still a spry 78 years old (he experienced a stroke two years later). Nonetheless, there is a Garth-Halley connection. Apparently Joseph Addison had written Berkeley in 1719 (since Berkeley was still in Italy that year) that Garth "in his last illness had refused the consolations of religion on the ground that Edmond Halley had convinced him that there was no truth in it" (see Luce, *Life of Berkeley*, 164). Talk concerning Halley's free-thinking (deism bordering on atheism) was not confined to private correspondence. Halley had a

Berkeley does not refer directly to the former Master of the Mint; but anyone who wrote of specie in Britain during this period had to deal with the work and legacy of Newton.¹⁴

Berkeley had a very complex relation with Newton. He did recognize that Newton was not an atheist (although there were many rumors circulating about his dismissal of Trinitarianism and his possible monophysitism).¹⁵ He also recognized the importance of Newton's *Principia*, for all his philosophical differences with Newton's notions of absolute space and time. Indeed, Newton's interventionist Pancreator conception of God has some resemblance to the Berkeley's loquacious God who continually delivered sensory ideas for his creatures.

But emanating out from Newton were ever-enlarging and overlapping fields of opponents including "The Great Author's" followers (e.g., Halley), whom he called "Philomathematical Infidels of these Times," libertines, free-thinkers, and materialists, even though Newton—being somewhat like the absent-minded but pernicious king of Laputa in Swift's *Gulliver's Travels*—perhaps was not a member of any of these sects. This common source of evil, according to Berkeley's lights, would inevitably bring one to see a common problematic posed by *The Analyst* and *The Querist*.

number of brushes with ecclesiastic authorities. For example, as Colin A. Ronin points out, in 1691 Halley was "refused a Chair [in astronomy] at Oxford because of charges of religious and moral apostasy" [Colin A. Ronin, *Edmond Halley: Genius in Eclipse* (Garden City, NY: Doubleday and Company, 1969), 93]. Unfortunately, Ronin confuses Berkeley with another of Halley's antagonists, Richard Bentley (121). [For an account of this incident and its background, see S. P. Rigaud's and Sir David Brewster's remarks quoted in Eugene Fairfield MacPike, *Correspondence and Papers of Edmond Halley* (New York: Arno Press, 1975), 266-68.] In his *Defence of Free-Thinking in Mathematics* Berkeley makes clear (at least to those familiar with Garth's death) that Halley is the major infidel referred to in *The Analyst*. He does this by directly mentioning Addison's 1719 testimony in response to the author of *Geometry no Friend to Infidelity, or a Defence of Sir Isaac Newton and the British Mathematicians*. The author of the *Geometry* ["Philalethes Cantabrigiensis"] had charged that those who claim to find infidels among prominent supporters of the "Doctrine of Fluxions" are "a pack of base profligate and impudent liars." Berkeley writes, "the late celebrated Mr. Addison is one of the persons, whom you are pleased to characterize in those modest and mannerly terms. He assured me that the Infidelity of a certain noted Mathematician [Halley], still living, was one principal reason assigned by a witty man of those times [Garth] for his being an Infidel." See Berkeley's *Defence*, sec. 7, ed. David R. Wilkins (2002), <http://www.maths.tcd.ie/pub/HistMath/People/Berkeley/Defence/Defence.pdf>.

¹⁴ Strangely, this receives no attention in *The Cambridge Companion to Newton*.

¹⁵ Newton's anti-Trinitarianism was something of an open secret among his friends (and a few of his enemies). Newton struggled to keep it *sub rosa*. As Scott Mandelbrote writes: "For Newton, the notion of the divine Trinity represents the culmination of the human tendency to corrupt religion into idolatry. . . . Newton wanted to confine suffering for his faith to the private experience of his closet, even though his personal beliefs were quite different from those of ordinary members of the Church to which he nominally belonged" (Mandelbrote, "Newton and Eighteenth-century Christianity," in *Cambridge Companion to Newton*, 421).

II. Money and Mathematics: A Précis of the History of the Relation and Its Application to Our Case

In the previous section I claimed that there are biographical reasons to compare *The Querist* and *The Analyst*—namely, the insistence on notional elements as the means for overcoming problems posed in theories of money and mathematics, and the common antagonists in each of these two areas. In this section I will deal with the wider set of connections between money and mathematics that lead me to suspect that there are many shared themes in these two texts.

Much 19th and early 20th century social theory centers on how the development of the form of money has had a profound influence of mathematics and vice versa. The most insightful commentator on this interaction was Georg Simmel, who argued that with the triumph of a monetary society, social life inevitably became both more mathematical and “intellectual,” in the sense that the participants in a monetarized economy are continually posing and confronting complex and ever lengthening series of means to achieve their ends.

Simmel’s *Philosophy of Money* (1900) is, in fact, a paean (and a dirge) that addresses the impact of money on social life. In his characteristic suggestive prose he writes in the section “The calculating character of modern times”:

By and large, one may characterize the intellectual functions that are used at present in coping with the world and regulating both individual and social relations as *calculative functions*. Their cognitive ideal is to conceive of the world as a huge arithmetical problem, to conceive events and the qualitative distinction of things as a system of numbers. . . . The money economy enforces the necessity of continuous mathematical operations in our daily transactions. The lives of many people are absorbed by such evaluating, weighing calculating and reducing of qualitative values to quantitative ones. (444)

But the mathematization of everyday life as a consequence of its monetarization is only the more obvious, often decried, aspect of the relationship between mathematics and money. According to Simmel, there is a more subtle, transcendental connection to be made: money creates the foundations for a mathematical conceptualization of value *tout court*, because it makes stable, reified, and objective values possible. The possibility of applying mathematics (be it arithmetic, geometry, or algebra) to human affairs necessitates a set of values that have these characteristics; otherwise there would be no point in attempting to apply mathematics to them or to reflect mathematically on them. If one lived in an Alice-in-Wonderland dream world, where a set of six “entities” and a distinct set of five “entities” are merged inexplicably into one of twelve “entities,” then both the scare quotes and the rules of addition would be useless in practice. In Simmel’s account, money, which is the ultimate product of economic exchange, in effect creates “a realm of values that is more or less completely detached from the subjective-personal substructure,” even though it arises from it (79). A mathematics (as well as a logic and

law) of human activity can only develop in a world of absolute values that are created in a monetary society.

Simmel's insight (as well as Marx's) had an impact on the history of mathematics in the twentieth century (as well as in the philosophy of mathematics via the Hegelian-Marxist influenced work of Imre Lakatos and social constructivism).¹⁶ Historical research on the major florescent periods of mathematics (and mathematical physics) was revised in its light. Thus, the connection between the beginning of coinage in Lydia in the 7th century B.C.E. and the development of geometry and other forms of mathematics in Magna Grecia in the following two centuries has become something of a well-traveled road.¹⁷ More recently, Joel Kaye has studied the tie between the revival of economic and monetary life and the development of a new mathematical physics in the later medieval period. He aims to "provide an outline of a mechanism of transference between the scholar's conception of the social world and his conception of the natural world, between his insights into the working of a monetized society and his insights into the working of a newly quantifiable and measurable nature."¹⁸

Of course, the interrelation of the rise of capitalism in the 15th and 17th centuries with the "mathematization of the world" of that period is the most developed site in this tradition of scholarship.¹⁹ The theory of probability has received the bulk of recent attention from this perspective, but the development of the calculus has often been connected with the impact of monetarization as well.²⁰

This research program leads me to suspect that Berkeley's almost simultaneous composition of *The Analyst* and *The Querist* was no accident, and that there are important cross-references and common themes between the economic and mathematical aspects of these works (as well as the "economic" and mathematical and philosophical work of Berkeley's immediate 17th antecedents and 18th century contemporaries). Accordingly, I

¹⁶ See Imre Lakatos, *Proofs and Refutations: The Logic of Mathematic Discovery*, ed. J. Worrall and E. Zahar (Cambridge: Cambridge University Press, 1976); and Paul Ernest, *Social Constructivism as a Philosophy of Mathematics* (Albany, NY: State University of New York Press, 1998).

¹⁷ Cf. Sohn-Rethel, *Intellectual and Manual Labour*; George Thomson, *The First Philosophers: Studies in Ancient Greek Society*, 2nd ed. (London: Lawrence & Wishart, 1961); and Sal Restivo, *The Social Relations of Physics, Mysticism, and Mathematics* (Dordrecht: D. Reidel Publishing Co., 1983).

¹⁸ Kaye, *Economy and Nature*, 12.

¹⁹ Cf. Frank J. Swetz, *Capitalism and Arithmetic: The New Math of the 15th Century* (La Salle, IL: Open Court, 1987); Mary Poovey, *A History of the Modern Fact: Problems of Knowledge in the Sciences of Wealth and Society* (Chicago: University of Chicago Press, 1998); Brian Rotman, *Signifying Nothing: The Semiotics of Zero* (Stanford, CA: Stanford University Press, 1987); and Restivo, *Social Relations*, chap. 15.

²⁰ Regarding probability, see Lorraine J. Daston, *Classical Probability in the Enlightenment* (Princeton: Princeton University Press, 1988), and Edith Dudley Sylla, "Business Ethics, Commercial Mathematics, and the Origins of Mathematic Probability," in *Oeconomies in the Age of Newton*, ed. Margaret Schabas and Neil De Marchi (Durham, NC: Duke University Press, 2003), 309-27.

will follow its path and in the following section I will present a common theme I have discovered: Berkeley's revaluation of algebraic representation and its use in monetary theory and practice.

III. Algebra ∴ Paper Geometry ∴ Specie

I have given some reasons why I believe that there are important common themes in both *The Querist* and *The Analyst* above, but one can with justice say that there are other reasons to keep them separate. After all, *The Analyst* deals with recondite technical details in analysis (what is now largely called “the differential and integral calculus”) that were at the frontiers of mathematical practice in the first part of the 18th century, while *The Querist* is a critique of metallism (both theoretical and practical). *The Analyst* does not deal with money, while *The Querist* does not deal with the calculus; so why should they meet?

I argue that there is a central theme that both texts share—*representation*—and that both *The Analyst* and *The Querist* announce (a) a crisis of representation in their respective fields, (b) a critique of self-reflexive forms of representation, (c) a need to overcome the crisis by a revaluation of current systems of representation, and (d) the importance of algebraic methods in both mathematical and monetary representation.

The Analyst and *The Querist* deal with contrasting pairs of systems of representation: algebraic vs. geometric representation in the former, and specie vs. paper forms of money in the latter. Although in practice algebra and geometry since Descartes' *Geométrie* were being used cooperatively, algebraic and geometric “ideologies” were often in conflict with each other among mathematicians as well as philosophers.²¹ For example, as Douglas Jesseph points out, “Hobbes is famous for his rejection of the methods of symbolic algebra as a ‘scab of symbols’ which deface geometric demonstrations” (120); and Hobbes was not alone.²² Indeed, this algebra/geometry tension was very much in evidence in Berkeley's *Analyst* and has deep roots in his own thought.²³

²¹ See Douglas M. Jesseph, *Berkeley's Philosophy of Mathematics* (Chicago: University of Chicago Press, 1993), 89-92.

²² Newton in his last days was as concerned about this “scab” as was Hobbes almost a century before. Henry Pemberton, the editor of the third [1726] edition of the *Principia*, wrote: “I have often heard him [Newton] censure the handing of geometrical subjects by algebraic calculations. . . . Of their [the ancients'] taste and form of demonstration Sir Isaac always professed himself a great admirer: I have heard him even censure himself for not following them yet more closely than he did, and speak with regret of his mistake at the beginning of his mathematical studies in applying himself to the works of Des Cartes and other algebraic writers before he had considered the elements of Euclide with that attention, which so excellent a writer deserves” (cited in Niccolo Guicciardini, “Analysis and Synthesis in Newton's Mathematical Work,” *Cambridge Companion to Newton*, 318).

²³ Cf. Jesseph, *Berkeley's Philosophy of Mathematics*; and Richard J. Brook, *Berkeley's Philosophy of Science* (The Hague: Martinus Nijhoff, 1973), 147-70.

Similarly, in practice, even though most economies in the 18th century had both precious metal coinage and various forms of paper currency operating (and interchanging) side by side, the metallic and paper “ideologies” were often in conflict with each other. Indeed, the whole point of Berkeley’s *Querist* is to stimulate interest in creating a specie-less currency in Ireland due to his conviction that specie operated as a harmful “drug” there.

III.a The Dual Crises

The Analyst and *The Querist* were implicated in the dual “wars” of the representational systems of both mathematics and money which, as far as Berkeley was concerned, had reached crisis proportions in the early 1730s. The crisis of representation to which *The Analyst* points is of a system of representation that had enormous prestige in mathematics (viz., geometry), but for Berkeley that system was being subverted by mathematicians who were “infidels” not only against religion but also against the ideals of geometry itself. As Berkeley had emphasized in his early mathematical writings, geometric representation is rooted in perceivable extension, and its signifiers are diagrams that have immediate similitude with their signified. Geometric demonstrators employ diagrams to keep their selective attention grounded in making their proofs about the lines and figures of the science.²⁴ As a consequence, the early Berkeley admired the power of geometric reasoning especially as a pedagogical tool.

However, with the development of the calculus and Newton’s allied “method of fluxions” as its justification, Berkeley began to question the authority of geometric representation. He writes in *The Analyst*: “Of a long Time I have suspected, that these modern Analytics were not scientific, and gave some Hints thereof to the Public about twenty five years ago” (*Analyst* 50). For he believed, according to Jessephe:

the calculus is fundamentally a geometric theory, whose proper object is perceivable extension. Thus, the key terms in the calculus must be interpretable in terms of perceivable extension, i.e., we must be able to frame ideas corresponding to these terms. . . . a theorem of the calculus (such as the determination of the arc-length of a curve) concerns extended objects and cannot be legitimately obtained unless each step in the derivation has the appropriate ideas corresponding to it. (Jessephe 116-17)

It is exactly the “social contract” between demonstrator and the public—“each step in the derivation has the appropriate ideas corresponding to it”—that was violated by the “Great Author and his followers” in the field of analysis, thus bringing on a crisis of reason severe enough for Berkeley to return to it “after so long an Intermission of these Studies” (*Analyst* 50). This return was especially imperative in a period when ideas themselves were losing their exclusive role in Berkeley’s ontology.

²⁴ In my exposition of Berkeley’s views on geometry and the calculus I will refrain from pointing out a number of important problems that Berkeley’s philosophy of geometry posed even when applied to the most ideal setting. For more on these problems, see Brook, *Berkeley’s Philosophy of Science*, 164-69.

A similar crisis of representation was taking place in the money form throughout Europe and its colonies, but in Ireland especially. The millennia-old money system based on gold and silver coinage (which set the stage, according to Sohn-Rethel and others, for the development of the abstraction necessary for geometry) was in crisis in the Ireland Berkeley found on returning to claim his bishopric in 1734. Simply put, Ireland was experiencing a monetary catastrophe that was described vividly by Berkeley's friend, lawyer and political confidant, Thomas Prior, who in 1729 "calculated that in contemporary England there was available forty shillings per head of population, 13s, 4d in silver and the rest in gold, whereas in Ireland there was only 4s, 5.25d per head, of which 5d was in silver and the rest in gold."²⁵

This ten-to-one ratio of specie in England and Ireland deeply worried Berkeley, Prior, and their circle, since it seemed to condemn Ireland to perpetual poverty. On their analysis, the gold and silver money supply was not adequate for the needs of the country, for practical and theoretical reasons. In practice, they argued, (i) gold and silver coins made it possible for absentee landlords to live abroad and to have their rents (paid in gold or silver money) transported immediately to London or the continent, and (ii) the denominations of gold and silver coins were too large to be used for the small change required by rural cottiers and urban workers in their markets.

Theoretically, Berkeley and his friends refused to accept the mercantilist identification of the quantity of specie within a country with its wealth; and they refused to believe that the referent of a unit of money was an intrinsic value measured by an amount of precious metal. They maintained that the best measure of national wealth is coordinated collective activity (what Berkeley called "the momentum of the State"), which would increase every individual man's (and woman's?) power "according to his just pretensions and industry." In Ireland's case, though, gold and silver coinage was not conducive to increasing the momentum of the state. Moreover, the obsession to find and fix the correct referent of money as a value reflected by the gold or silver in a coin is misguided and destructive in a poor country like Ireland where disenfranchised "native" workers have developed a "cynical content" and were unwilling to exert themselves. This monetary semantics undermined the true function of money (which is notional), for the whole point of money is not to refer to a sort of thing or a collection of ideas (in the way a word like "stone" refers to a thing). It is rather to promote, transfer, and secure a commerce in the command over human labor—all of which are quite notional entities.

III.b The Critique of the Certainty of Self-Reflexive Representation

Where, according to Berkeley, did the two great systems of representation in mathematics and money go wrong? I believe that he traced the source of their crises (though not the motivations behind them) in their similar virtues—the chief being the self-reflexive aspect of their signifiers: diagrams in geometry, and precious metal coins for money. Both diagrams and specie coinage had their truth literally "written in them." Purportedly, they have a self-correcting, self-evident feature that the rival forms of representation (i.e.,

²⁵ Cited by Johnston, *Berkeley's "Querist"*, 68.

algebra and paper currency) do not; hence their superiority. In particular, *The Analyst* and *The Querist* question, respectively, the incorruptible epistemological virtues of geometry and precious metal coinage.

For example, at the beginning of *The Analyst*, Berkeley sets out the geometric code of behavior:

It hath been an old remark that Geometry is an excellent Logic. And it must be owned, that when the Definitions are clear; when the Postulata cannot be refused, nor the Axioms denied; when from the distinct Contemplation and Comparison of Figures, their Properties are derived, by a perpetual well-connected chain of Consequences, the Objects being still kept in view, and the attention ever fixed upon them; there is acquired a habit of reasoning, close and exact and methodical: which habit strengthens and sharpens the Mind, and being transferred to other Subjects, is of general use in the inquiry after Truth. But how far this is the case of our Geometrical Analysts, it may be worth while to consider. (*Analyst* 2)

The most important point about this “old remark” for us is the emphasis on “the distinct Contemplation and Comparison of Figures . . . the Objects being still kept in view, and the attention ever fixed upon them.” What is crucial about geometry is not only its deductive character, but its valuation of figures (geometric diagrams) in the process of deduction. Any student of geometry would understand Berkeley’s point, for the whole charm of geometric truth is its almost hallucinatory connection with the diagram. Truth seems to grow out of it, while it exemplifies this truth in its being.

Berkeley saw the diagram as an essential part of the process of geometric deduction from the beginning of his philosophical work. For example, in his description of how a geometric proof that deals with one particular triangle can be generalized, he writes in the Introduction of the *Principles*:

though the idea I have in view whilst I make the demonstration, be, for instance, that of an isosceles rectangular triangle, whose sides are of determinate length, I may nevertheless be certain it extends to all other rectilinear triangles, of what sort of bigness soever. And that, because neither the right angle, nor the equality, nor determinate length of the sides, are at all concerned in the demonstration. It is true, the diagram I have in view includes all these particulars, but then there is not the least mention made of them in the proof of the proposition. (PHK IN 16)

In this analysis of generalization in geometry, the diagram plays an essential role in setting up the problem.²⁶ Indeed, in the case at hand, it is a particular idea that is to be generalized and be a sign of all triangles. Nonetheless, the proper functioning of the diagram in geometric reasoning requires that a sort of social contract be made between the demonstrator and the public. That is, nothing can be brought into the demonstration that is not “in view.” The proof must be clear, transparent and open to generalized

²⁶ On the interpretational problems posed by Berkeley’s insistence on the importance of diagrams in geometric reasoning, see Brook, *Berkeley’s Philosophy of Science*, 164-68.

attention, for the issue of generalization applies not only with respect the object, but also with respect to the *general attention* that is being paid to the demonstration by the mathematical public.

Berkeley clearly expresses this requirement in Section 34 of *The Analyst* where he writes:

If it is said that Fluxions may be expounded or expressed by finite lines proportional to them: Which finite Lines, as they may be distinctly conceived and known and reasoned upon, so they may be substituted for the Fluxions, and their mutual Relations or Proportions be considered as the Proportions of Fluxions: By which means the Doctrine becomes clear and useful. I answer that if, in order to arrive at these finite Lines proportional to the Fluxions, there be certain Steps made use of which are obscure and inconceivable, be those finite lines themselves ever so clearly conceived, it must nevertheless be acknowledged that your proceeding is not clear nor your method scientific.

If the geometric demonstrator is to be scientific, he or she is required to use diagrams in a way that is compatible with their intent “as Signs of all possible finite Figures, of all sensible and imaginable Extensions or Magnitudes of the same kind” (*Analyst* Qu. 6). In other words, if analysis is a geometric science, which it claims to be, then it must consider geometrical diagrams as “Representatives of all assignable Magnitudes or Figures of the same kind” (*Analyst* Qu. 17) *and no more*.

Thus, *as long as analysis is geometric*, it is limited by the restrictions on geometric demonstration that, for example, algebra is not. Berkeley suggested the difference in the following query: “Whether because, in stating a general Case of pure Algebra, we are at full liberty to make a Character denote, either a positive or negative Quantity, or nothing at all, we may therefore in a geometrical Case, limited by Hypotheses and Reasonings from particular Properties and Relations of Figures, claim the same Licence?” (*Analyst* Qu. 27). As Berkeley repeatedly points out, he is not questioning the *truth* of analysis’ results, but rather the *ethics* of the production of these truths. In particular, the self-reflexive power of the geometric diagram was subverted by the Great Author and his followers in order to justify their results, creating a crisis for geometry itself, unless it can reassert its restriction to finite extension.

A similar problem emerged in the dominant representational system of money, that is, specie. The power of that system is dependent on its self-reflexive character. In its terms, something is a sign of value V precisely because it *has* an “intrinsic” value V. It can take a “natural” place in the realm of exchange as something of a god, since it can measure the value of all other commodities through its own self-evident value. Berkeley questions the power of this self-reflexive character of specie by subverting the traditional conception of money when he asks “Whether money is to be considered as having intrinsic value, or as being a commodity, a standard, a measure, or a pledge, as is variously suggested by writers?” (*Querist* 23). His negative answer to this question is suggested in the remaining part of the same query: “And whether the true idea of money, as such, be not altogether that of a ticket or counter?”

In fact, throughout *The Querist* Berkeley dethrones the self-reflexive semantic role of specie and promotes another role that makes it nugatory. For example, consider the following queries (employing the standard ethnic prejudices of the day):

What makes a wealthy people? Whether mines of gold and silver are capable of doing this? And whether the negroes, amidst the gold sands of Afric, are not poor and destitute? (*Querist* 29)

Whether there be any virtue in gold or silver, other than as they set people at work, or create industry? (*Querist* 30)

Whether even gold or silver, if they should lessen the industry of its inhabitants, would not be ruinous to a country? And whether Spain be not an instance of this? (*Querist* 43)

In other words, the crucial semantic questions that are posed by those who take the intrinsic value of gold and silver—for example, what is the ratio of fine gold to fine silver in various European countries?—are not relevant to Berkeley's concept of money. Newton, as Master of the Mint, wrote concerning this ratio in his *Memorial on the State of the Gold and Silver Coin* (1717):

In the end of King William's reign, and the first year of the late queen [Anne], when foreign coins abounded in England, I caused a great many of them to be assayed in the mint, and found by the assays that fine gold was to fine silver in Spain, Portugal, France, Holland, Italy, Germany, and the northern kingdoms.²⁷

His research led him to recommend that the gold guinea be reduced by 6d to a value of 21s in order to increase the silver coinage in Britain. The result, however, was not as Newton expected: "After 1717 less than £600,000 worth of silver was minted during the rest of the [18th] century, while for the same period well over £70 million of gold coin was produced."²⁸ Thus Newton inadvertently presided over the initiation of the gold standard that was imposed worldwide with the triumph of Britain in the Napoleonic wars a century later.

Berkeley's response to such investigations and recommendations was to show that the purported self-reflexive intrinsic value of specie did not have the transcendent virtues attributed to it. He queried the Newtons of the world who took the gold/silver exchange rate as the crucial monetary variable: "Whether altering the proportions between the several sorts can have any other effect but multiplying one kind and lessening another without increase of the sum total?" (*Querist* 27). In other words, the very variability of the ratio of exchange between gold and silver indicated that the claimed god-like objective status was questionable.

²⁷ Reprinted in *Considerations on the silver currency . . . containing a report of Sir Isaac Newton on the state of the gold and silver coin* (Dublin: J. Miliken, 1805), 49.

²⁸ Derek Gjertsen, *The Newton Handbook* (London: Routledge and Kegan Paul, 1986), 364-65.

Indeed, what Berkeley did was simply to change the goal of the semantic game of money by substituting, for questions like “How much gold was in this guinea?” to questions like “How much industry does this guinea excite?” He thus literally changed the subject.

III.c The Revaluation of Systems of Representation

The Analyst and *The Querist* revealed crises in forms of representation in money and mathematics that had been dominant for more than two millennia. Ironically, in the moment of triumph and expansion of both the geometric and the metallist forms of representation in the 18th century, Berkeley found a rapidly disintegrating situation that required an intellectual and semantic revolution: new forms of representation had to replace the old, failing ones. Inevitably, he turned to the “other” representational systems in their respective fields—algebra and paper currency—and revalued them.

In the last section of *The Analyst* Berkeley puts forth a number of queries that ask the reader to revalue algebra. In his previous writings, he had had very little to say about algebra, and what little he said was presented in a light ludic manner. Indeed, his first publication *Miscellanea Mathematica* in 1707 included “De Ludo Algebraico,” a text that literally transformed algebra into a game. It is a description of an algebraic board game Berkeley invented “for the entertainment of undergraduates as a way to randomly generate a set of algebraic equations (or questions in the parlance of the day) that had to be solved competitively.”²⁹ The players randomly generated a series of algebraic equations (or “questions”) and competed in solving them.

He wrote of algebra then, “You see what a mere game algebra is, and that both chance and science have a place in it. Why not, therefore, come to the gaming table?”³⁰ It was an important game, for he did give algebra fulsome praise:

And, indeed, how difficult would it be to assign the limits of algebra, when it has latterly extended to natural philosophy and medicine, and daily sets about the most valuable arguments. . . . it may be laid down for certain that wherever greater and less are brought forward, wherever any ratio or proportion can be admitted, there algebra finds a place.³¹

In his few other direct references to algebra, he uses it as an example to make a point about how symbolic systems do not satisfy the Lockean semantic program that requires that one sign = one idea.³² Thus in the *Principles* he writes of algebra as a system “in which though a particular quantity be marked by each letter, yet to proceed right it is not requisite that in every step each letter suggest to your thoughts, that particular quantity it

²⁹ Caffentzis, *Exciting the Industry*, 262.

³⁰ Translated in Jesseph, *Berkeley's Philosophy of Mathematics*, 115.

³¹ Berkeley, “On the Algebraic Game,” trans. by G. N. Wright, *The Works of George Berkeley*, ed. George Sampson (London: George Bell and Sons, 1897), 1: 57.

³² Caffentzis, *Exciting the Industry*, 188-94.

was appointed to stand for” (PHK IN 19). And in *Alciphron* VII.14 he implicates algebra with the realm of notions.³³ For he begins the section by declaring that:

signs . . . have other uses besides barely standing for and exhibiting ideas, such as raising proper emotions, producing certain dispositions or habits of mind, and directing our actions in pursuit of that happiness, which is the ultimate end and design, the primary spring and motive, that sets rational agents at work: that signs may imply or suggest the relations of things; which relations, habitudes or proportions, as they cannot be by us understood but by the help of signs, so being thereby expressed and confuted, they direct an enable us to act with regard to things.

Clearly, emotions (e.g., love and hate), dispositions or habits of mind, directions of action, and relations are exactly what Berkeley defined as notions in the 1734 revision of the *Principles* and the *Dialogues*. He points out in the notional realm there can be “a conceived good” even though it cannot be exhibited as an idea to the mind. He then turns, as clinching example, to what he calls an algebraic sign, the square root of a negative number, and claims that it is useful “in logistic operations, although it be impossible to form an idea of any such quantity” (*Alciphron* VII.14).

Another way of seeing the relation of algebra to the notion is by noting its closeness to arithmetic in Berkeley’s thought. As Jesseph puts it, Berkeley’s philosophy of arithmetic “extends without significant modification to include algebra.”³⁴ This connection is not unique to Berkeley, of course. Many commercial arithmetic texts follow their sections on the mechanics of addition, subtraction, multiplication and division with a set of problems from the business world that we would now consider algebraic (e.g., the “rule of three” in the *Treviso Arithmetic* of 1478).³⁵ But Berkeley’s view of arithmetic (and thus algebra) is both formalist and instrumentalist. As he writes in the *Principles*: “In arithmetic therefore we regard not the things but the signs, which nevertheless are not regarded for their own sake, but because they direct us how to act with relation to things and dispose rightly of them” (PHK 122). Berkeley’s emphasis on action with respect to arithmetic (and algebra) is evident and immediately implicates them with a notional function in mental economy. Arithmetic and algebra (unlike geometry) direct the “how,” but they do not demonstrate the “that.” They involve the “right” and “wrong” disposition of the will, not the “true” or “false” of the understanding. But as Flage has argued, the former is exactly what notions are, “the actions of the mind or disposition of the mind to act in certain ways.”³⁶ Thus arithmetic and algebra are directly notional while geometry remains ideational.

Given the difficulties of a geometry embroiled with fluxions and the gradually improving status of algebra in his thought, it should not be surprising that by 1734 Berkeley would have raised algebra to the status of a science. Consider the series of queries concerning algebra in *The Analyst* Qu. 41–46, including:

³³ Citations of *Alciphron* (by dialogue number and section) are taken from *Alciphron in Focus*, ed. David Berman (London: Routledge, 1993).

³⁴ *Berkeley’s Philosophy of Mathematics*, 284.

³⁵ Swetz, *Capitalism and Arithmetic*, 101-109.

³⁶ Flage, *Berkeley’s Doctrine of Notions*, 188.

Whether in the most general Reasonings about Equalities and Proportions, Men may not demonstrate as well as in Geometry? Whether in such Demonstrations, they are not obliged to the same strict Reasoning as in Geometry? And whether such their Reasonings are not deduced from the same Axioms with those in Geometry? Whether therefore Algebra be not as truly a Science as Geometry? (*Analyst* Qu. 41)

Whether, although Algebraic Reasonings are admitted to be ever so just, when confined to Signs or Species as general Representatives of Quantity, you may not nevertheless fall into Error, if, when you limit them to stand for particular things, you do not limit your self to reason consistently with the Nature of such particular things? And whether such Error ought to be imputed to pure Algebra? (*Analyst* Qu. 46)

This transformation of Algebra into a science that can include notions (that is, significant, useful, but non-ideational elements like “imaginary numbers”) is a decisive development in Berkeley’s philosophy of mathematics. Paradoxically, indeed, Berkeley’s move makes possible an even higher level of abstraction in mathematics than afforded by those fields that were still in the thrall of the diagram.

A similar transformation takes place for paper currency in *The Querist*. It should be clear that paper currency was an alternative to specie for some time before 1734, and it joined with a set of other paper instruments like bills of exchange, stocks, checks, and debt documents to overwhelm gold and silver coinage in Europe. As Fernand Braudel points out about 18th century European economies:

In Amsterdam, London and Paris, we have seen that company shares were quoted on the Exchanges. Add to this “bank notes” of various origin and one has an enormous mass of paper money. Sages at the time said that it should not be more than three or four times the value of the mass of metal money. But ratios of 1 to 15 or more are extremely probable at certain periods in Holland and England.³⁷

Moreover, Berkeley had direct experience living in a largely specie-less economy in Rhode Island a few years before.³⁸ Consequently, the proposal to “de-specie-ize” the Irish economy was not as unprecedented as it might have sounded.

It is true that paper currency was being criticized as dangerous throughout the Atlantic world in the aftermath of Law’s experiment in 1719-20 and the inflation in the North American colonies presumably brought about by unregulated paper money creation. But though he recognized the difficulties posed by paper currency, Berkeley was convinced that if it were properly regulated, paper currency in Ireland would solve many social difficulties. Money in Berkeley’s view was notional, in that it did not represent an idea or a collection of ideas but rather was involved in “raising proper emotions, producing certain dispositions or habits of mind, and directing our actions in pursuit of that

³⁷ Fernand Braudel, *The Wheels of Commerce [Les Jeux de l’échange]*, trans. Sian Reynolds (Berkeley: University of California Press, 1992), 113.

³⁸ Caffentzis, *Exciting the Industry*, 80-100.

happiness, which is the ultimate end and design [of human activity]” (*Alciphron* VII.14). But paper money is exponentially notional in that it does not represent any particular value, but in Berkeley’s scheme it is literally created by a National Bank. His proposal was that a National Bank be founded, “That Bank Notes be minted (a) to the Value of one hundred thousand Pounds, in round numbers for one Pound to Twenty. (b) That such Notes be issued, either to particular Persons on Cash or Security; or else, to the Uses of the Publick on its own Securities.”³⁹ Indeed, this Bank need not have any starting “fund” at all, and hence not even need a “fig leaf” of representationality (although Berkeley was not against providing such a “fig leaf” if it was politically required.⁴⁰

Ironically enough, if the notional aim of the paper currency (viz., exciting industry) succeeds, then it will eventually lead to a healthy economy and “in the event, multiply our Gold and Silver.” So Berkeley urges, in order to increase the skill and industry of the people, they must be encouraged by “ready Payments” (as the children Berkeley was referring to in this essay’s epigraph):

These Payments must be made with Money, and Money is of two sorts: Specie or Paper. Of the former, we neither have a sufficient Quantity, nor yet Means of acquiring it. Of the latter Sort, we may have what we want, as good and current as any Gold for Domestic Uses. Why should we not therefore reach forth our Hand, and take of that Sort of Money which is in our Power; and which makes far the greater Part of the Wealth of the most flourishing States in Europe?⁴¹

Berkeley’s revaluation of paper money and his emphasis on the notional, non-ideational aspects of money were simultaneous, interacting developments. Indeed, I claim that his philosophical revaluation of notions (as well as principles, opinion and even prejudices) gave him the intellectual ability to challenge the powers supporting specie, while his philosophy of money concretized his “second conceptual revolution.”

III.d Algebraic Money: The Importance of the Ludic (Counters)

I have traced parallel developments in the dual systems of representation in mathematics and money in Berkeley’s thought. Now the question is: do the parallels ever intersect? Is there a textual support for going beyond mere homology to actually connecting algebra with paper currency?

I believe that there is, if we consider the notion of money as a counter. Indeed, Berkeley asks in *Querist* 23 “Whether the true Idea of Money, as such, be not altogether that of a Ticket or Counter?” But what does the counter count? He immediately suggests the answer: “Whether the value or price of things be not a compounded proportion, directly as the demand, and reciprocally as the plenty?” (*Querist* 24); and “Whether the terms

³⁹ George Berkeley, “The Plan or Sketch of a National Bank,” in Johnston, *Berkeley’s “Querist,”* 205.

⁴⁰ Caffentzis, *Exciting the Industry*, 293-94.

⁴¹ Berkeley, “The Plan of a National Bank,” 207.

crown, livre, pound sterling, etc. are not be considered as exponents or denominations of such proportion? And whether gold, silver, and paper are not tickets or counters for reckoning, recording and transferring thereof?" (*Querist* 25).

According to the OED, in early 18th century mathematical terminology, an "exponent" is "the ratio or proportion between two numbers or quantities, the quotient arising when the antecedent is divided by the consequent. Thus 6 is the exponent of the ratio that 30 was to 5." Counters thus count ratios and proportions. But in Berkeley's 1734 terms, ratios and proportions are relations and therefore notions. Because "general reasonings about equalities and proportions" are identified with algebra (*Analyst* Qu. 41), the counters that reckon, record, and transfer these proportions are doing algebra-like operations.

The connection between money, algebra, and the queries found in the works of the mid-1730s thus retrieves a theme that Berkeley had raised as early as his "De Ludo Algebraico." As I noted in *Exciting the Industry of Mankind*:

the mature Querist poses "questions" just as the youthful player of the Algebraic Game finds chance has posed for him or her "questions" in the form of algebraic equations. The Querist's solution is to be found in the algebraic movement of the spirits which have been released from the delusion that their pegs and counters are the "solution" to their question, rather it is their activity that is the solution. The Irish economy has to be ludified if the solution to the final question of *The Querist*, was to be found, according to the Querist.⁴²

For Berkeley, "algebraic money" was the solution to the fundamental economic problems of Ireland. Accordingly, the primacy of the question as the linguistic correlate for money is vindicated and the parallel crises are brought together.

Conclusion

Berkeley was a subtle thinker, especially later in his life. Even though he was always a passionate advocate throughout his life, the brash but powerful dichotomies of his youth were replaced by a more nuanced conception of the subjects of his studies, including mathematics and money. His promotion of algebra and paper currency over geometry and specie was not eliminative. On the contrary, he was anxious in both the fields of mathematics and money to devise more generalized and effective notions of rigor that would harmonize the past (i.e., Euclidean geometric reasoning and the specie-dominated monetary system) with the needs of the present (i.e., a coherent presentation of the powerful results of the calculus and a recognition of the increasing importance of paper and credit-based monetary instruments). "Algebraic money" is therefore a phrase that

⁴² Caffentzis, *Exciting the Industry*, 262-63.

tries to capture Berkeley's effort to achieve this vital harmony of the past and the new in two major fields of representation: mathematics and money.⁴³

University of Southern Maine
caffentz@usm.maine.edu

⁴³ Berkeley's *Analyst* had an impact on the more self-conscious development and differentiation of an algebraic and a geometric approach to the calculus. Colin Maclaurin's influential geometric book on the calculus, *Theory of Fluxions* [1742], was partly written as a response to Berkeley's criticism of Newton's theory, while Louis Lagrange's work on the calculus at the end of the 18th century seemed to agree with Berkeley's suspicion of the ethics of the fluxion diagram-makers [see Carl B. Boyer and Uta C. Merzbach, *A History of Mathematics*, 2nd ed. (New York: John Wiley and Son, 1989), 480]. As Judith V. Grabiner writes, "For Maclaurin, the calculus was at heart geometric; for Lagrange, the calculus was algebraic. Maclaurin's great *Treatise of Fluxions* has over 350 diagrams; Lagrange's masterwork on the calculus, the *Théorie des fonctions analytiques*, search as one will, contains none—just pages of text and formulas" ["The Calculus as Algebra, the Calculus as Geometry: Lagrange, Maclaurin and their Legacy," in *Vita Mathematica: Historical Research and Integration with Teaching*, ed. Ronald Calinger (Washington, D.C.: Mathematical Association of America, 1996), 132].

Berkeley and the Separate State of the Soul: A Note¹

Roomet Jakapi

According to Berkeley's published view, the human soul is a spiritual substance: "as it perceives ideas, it is called the *understanding*, and as it produces or otherwise operates about them, it is called the *will*" (PHK 27). The existence of the soul consists in *perceiving* and *willing/acting*. In other words, the existence of the soul consists in *thinking*, in a broad, more or less Cartesian, sense of the term. Berkeley claims, furthermore, that "the soul always thinks" (PHK 98). As long as the soul exists, first in this world and then in the next, it perceives some ideas and presumably "operates about them."² Put differently, no episodes of non-thinking occur, ever. For example, the soul cannot fall into, and wake up from, a *dreamless* sleep. Right before I fall asleep, I think, but the next moment I wake up, and the thinking goes on. If I have *no* perceptions "in the meantime," no time passes between these two moments. Each soul has its own time, as it were:

Time therefore being nothing, abstracted from the succession of ideas in our minds, it follows that the duration of any finite spirit must be estimated by the number of ideas or actions succeeding each other in that same spirit or mind. (PHK 98)

In short, there is no universal time or duration in which all finite spirits participate.

Berkeley's curious concept of time has implications for his view of the eternal, post-mortally existence of souls. These implications are evident in the beginning of *Notebook B* (NB 1-14), but also present in the *Principles*. In the latter work, Berkeley provides a metaphysical argument for the natural immortality of the soul (PHK 141), but he does not examine the nature of the post-mortally state of the soul. In other words, he aims to show *that* the soul is immortal, but does not explain *what* this post-mortally existence is *like* or how it is to be conceived. Nonetheless some conjectures about his views can be made if we read the argument for immortality in the light of his account of soul and time, that is, in connection with *Principles* 2, 27, 97-98, and 135-40.

¹ Earlier versions of this paper were presented at Berkeley conferences in Rennes (2003), Helsinki (2007) and Gaeta (2007). I would like to thank participants of these conferences, especially Geneviève Brykman, Talia Bettcher, Bertil Belfrage, Howard Robinson, George Pappas and Marc Hight, for helpful comments and constructive criticism.

² Cf. George Berkeley, *Philosophical Works Including the Works on Vision*, ed. Michael R. Ayers (London: Everyman, 1992), NB 357: "If uneasiness be necessary to set the will at work. Qu: How shall we will in Heaven."

Berkeley's argument may look like a standard argument for immortality, but it has certain distinctive features. When introducing the argument, in sect. 141 of the *Principles*, he already assumes that immaterial souls or minds—active and perceptive entities—are the only substances in the world. Bodies are mere collections of ideas, passive appearances in minds. Minds are wholly distinct from, and have nothing in common with, bodies. Thus Berkeley says:

the soul is indivisible, incorporeal, unextended, and it is consequently incorruptible. Nothing can be plainer, than that the motions, changes, decays, and dissolutions which we hourly see befall natural bodies . . . cannot possibly affect an active, simple, uncompounded substance: such a being therefore is indissoluble by the force of Nature, that is to say, *the soul of man is naturally immortal*. (PHK 141)

The soul is created such that it will survive the collapse of the body. Immortality thus follows from the nature of the soul.

Given Berkeley's notion of time and his account of the essential features of the soul, the argument seems to imply that the post-mortal state of the soul will be a state of perception and action, not a state of "insensibility" and "inactivity." To say that the soul will not cease to exist (or will not be annihilated) is to say that it will continue to *think*, for, according to Berkeley's theory, it cannot *exist* without *thinking*. So, when I die, my body collapses, but my soul will not die or fall into a "dreamless sleep." Rather, the soul, then separated from the body, will have some "new ideas" to perceive and "operate about." In fact, Berkeley acknowledges this in a letter to Samuel Johnson:

it seems very easy to conceive the soul to exist in *a separate state* (*i.e.* divested from those limits and laws of motion and perception with which she is embarrassed here), and to exercise herself on *new ideas*, without the intervention of these tangible things we call bodies. It is even very possible to apprehend how the soul may have ideas of colour without an eye, or of sounds without an ear.³

The disembodied soul will perceive (and act as well) without eyes, ears, nerves and the brain. Thus, in accordance with Anglican Orthodoxy, Berkeley subscribes to the doctrine of the *separate* or *intermediate state* of the soul, as it was called. According to this doctrine, the disembodied souls of good Christians will perceive something extremely pleasant, they will feel the foretaste of heavenly rewards, whereas bad people will perceive something undesirable, they will feel the foretaste of hellish punishments. Exactly what faculties and capacities would the disembodied soul have, was a matter of debate in Berkeley's time.⁴

Berkeley was also committed to the doctrine of the general resurrection of the dead. He discusses resurrection in *Principles* 95, claiming that his immaterialist conception of the

³ Berkeley to Johnson, 25 November 1729, in *The Works of George Berkeley*, ed. A. A. Luce and T. E. Jessop (London: Thomas Nelson, 1948-57), 2: 282; emphasis added. [Hereafter: W.]

⁴ See, for example, Samuel Colliber, *Free Thoughts Concerning Souls* [1734] (Bristol: Thoemmes, 1990), 24-36, 86-118.

body solves all difficulties pertaining to the notion of bodily resurrection.⁵ A natural reading of the relevant passages in the *Principles* suggests that the human soul survives bodily death and continues to perceive and act in a disembodied (separate) state until it is reunited to its resurrected body. More precisely, the soul will *perceive* its body again and live happily ever after, or will be punished in hellfire, as the case may be.

Berkeley's immaterialist account of the journey of the soul through time into eternity is carefully constructed, even if the parts of the story aren't explicitly tied together in the *Principles*. But why is he, in his published work, so reticent on the nature of the post-mortual state(s) of the soul? Why doesn't he extend his conception of time beyond this world (like he does in the *Notebooks*)?⁶ An obvious reason is that the treatise in question is concerned with metaphysics and natural religion, not revealed religion. The argument for immortality, Berkeley holds, is sufficient for his metaphysical and theological purposes in that treatise.

However, there may be another reason. The subjectivist conception of time led Berkeley to strange conclusions about the afterlife. In his letter to Johnson, from 24 March 1730, he says:

A succession of ideas I take to *constitute* Time, and not to be only the sensible measure thereof, as Mr. Locke and others think. But in these matters every man is to think for himself, and speak as he finds. One of my earliest inquiries was about Time, which led me into several paradoxes that I did not think fit or necessary to publish; particularly the notion that the Resurrection follows the next moment to death. (W 2: 293)

How is the "resurrection paradox" to be interpreted? Does he mean that no time passes between my bodily death and resurrection since no succession of ideas occurs between these two events? If so, then my time doesn't flow between my death and resurrection, even if, from a conventional public point of view, thousands of years go by. I die (like I fall asleep), but the very next moment I wake up (like from a dreamless sleep). The train of ideas that constitutes my time does not stop at my bodily death. For right after my death (say in the year 2007) I resurrect on the Last Day (say in the year 4007) and the train of ideas in my soul continues. So the concept of private time does not quite fit with the common conventional notion of public time.

What about the separate state of the soul, then? Did Berkeley secretly dismiss the doctrine of the separate state and, like Hobbes and perhaps Locke, adopt some form of mortalism? Or did he believe that the separated soul would perceive ideas but not in

⁵ For a detailed account of Berkeley's view on resurrection, see Marc A. Hight, "Berkeley and Bodily Resurrection," *Journal of the History of Philosophy* 45 (2007): 443-58.

⁶ NB 14 reads as follows: "Eternity is onely a train of innumerable ideas. hence the immortality of the Soul easily conceiv'd. or rather the immortality of the person, that of the soul not being necessary for ought we can see." Cf. NB 590: "No broken Intervals of Death or Annihilation. Those Intervals are nothing. Each Person's time being measured to him by his own Ideas."

succession? Or did he believe that the order and succession of ideas in the separate state is essentially different from the order and succession of ideas in this life and thus cannot be considered as a part of *a person's time*? Given the textual evidence we have, the latter position seems most likely.

There is hardly any reason to doubt that Berkeley believed the doctrine of the separate state of souls. It has to be considered that in the previous letter to Johnson he explicitly admits the existence of the separate state and gives some hints about how to think of it. Unlike some of his contemporaries (e.g., Samuel Colliber), Berkeley was not willing to go into detailed speculations about the cognitive capacities of the separated soul. He preferred to talk about afterlife by means of analogy and metaphor. Thus in the *Guardian* essay "The Future State" he speaks about the departure of the soul from its body by means of the following simile:

Let us suppose a person blind and deaf from his birth, who, being grown to man's estate, is, by the dead palsy or some other cause, deprived of his feeling, tasting, and smelling, and at the same time has the impediment of his hearing removed, and the film taken from his eyes. What the five senses are to us, that the touch, taste and smell were to him. And *any other ways of perception, of a more refined and extensive nature*, were to him as inconceivable as to us *those are which will one day be adapted to perceive those things* which "eye hath not seen, nor ear heard, neither hath it entered into the heart of man to conceive." And it would be just as reasonable in him to conclude, that *the loss of those three senses* could not possibly be succeeded by any *new inlets of perception*, as in a modern Free-thinker to imagine there can be no *state of life and perception without the senses he enjoys at present*. Let us further suppose the same person's eyes at their first opening, to be struck with a great variety of the most gay and pleasing objects, and his ears with a melodious consort of vocal and instrumental musick: Behold him amazed, ravished, transported; and you have *some distant representation, some faint and glimmering idea of the extatic state of the soul in that article in which she emerges from this sepulchre of flesh into Life and Immortality*. (W 7: 183-84, emphasis added.)

The senses we have in the present state will be lost at death; they are not suitable to receive those ideas that God will produce in the soul after its separation from the body. So the disembodied soul will perceive by means of some new faculties. These "new inlets of perception" as well as the objects to be perceived in that state are in fact inconceivable to us at present.

According to Berkeley, "all things, past and to come, are actually present to the mind of God, and . . . there is in Him no change, variation, or succession."⁷ God has a tenseless "vision" of the created, temporal world. God is not in time, but He knows each human soul and the succession of ideas that constitutes its time. He also knows the ideas He produces in disembodied souls.

⁷ Berkeley to Johnson, 24 March 1730 (W 2: 293).

On Berkeley's view, I would suggest, the soul in the separate state perceives and wills; it is separated not only from its body but also from the succession of ideas which constitutes its time.⁸ The ordering of ideas in the separate state is distinct from the ordering of ideas before death and after resurrection.⁹ The succession of ideas in the present state of the soul continues with the reunification of the soul and body at the resurrection: "the resurrection follows the next moment to death." In other words, the ordering of ideas in the disembodied soul is not the same as that in the embodied soul. The soul in the separate state has ideas, but these ideas, even if perceived in some sort of succession, are not elements in the succession of ideas that constitutes the time of the soul. The time of each soul is in fact endless since the succession of ideas in the soul does not stop at death: the succession continues with the resurrection and lasts for ever. In this way, time becomes eternity.

Tartu University
roomet.jakapi@ut.ee

⁸ For somewhat different interpretations, see H. Scott Hestevold, "Berkeley's Theory of Time," *History of Philosophy Quarterly* 7 (1990): 179-92, esp. 188-89, and David Berman, *George Berkeley. Idealism and the Man* (Oxford: Clarendon 1994): 61-70.

⁹ For this line of thought I owe thanks to Marc Hight and Howard Robinson.

Review

David Berman. *Berkeley and Irish Philosophy*.
London: Continuum, 2005, x + 234 pp.

This volume collects some of Berman's contributions to Berkeley scholarship from 1968 to 1996 that exhibit coherence under their collective title and a new introduction.

According to Berman, Berkeley was a thinker whose responses to the concerns of Irish philosophy from 1696 to 1757 blend an attack on theological representationalism with a pragmatic and emotive account of meaning that attempts to counteract the freethinking tendencies of contemporary society. His work on the Bermuda project and his reception, in Britain, Ireland and America, are better understood with this context in view.

The introduction suggests that a common mistake and a highly developed visual sense might have informed Berkeley's thinking on abstract general ideas. In Berman's account, Berkeley was a psychological philosopher, interested in experimental observation of how the mind works. This can be seen in his work on ideas as mental images that can be recalled at will. Using the terminology of late nineteenth-century work on visual imaging, Berman suggests that Berkeley was an eidetic imager, someone who "can easily produce all sorts of imagined objects—men with two heads, parts of bodies imagined on their own—but whatever he imagines must have a particular, detailed shape and color. . . . He could not, it seems, imagine vague, sketchy ideas" (11). Berman suggests Berkeley took all minds to be alike in this respect. However, subsequent empirical work on imaging by Francis Galton demonstrates he was wrong to do so. Berman does not acknowledge what this implies for Berkeley's argument against abstract general ideas—namely, that if some people are less visually accurate than Berkeley and can "imagine vague, sketchy ideas," they may well imagine a triangle that possesses none and all of the properties of scalene, equilateral, etc. triangles. If people can imagine such triangles, then Berkeley's assault on Platonic metaphysical ideas such as "triangularity" (28) loses one of its key arguments, and this is probably not one of the "positive implications . . . for Berkeley's idealism" (15) Berman was thinking might develop from his work on Berkeley's mental imaging.

The next chapter offers a general introduction to Berkeley's philosophy, emphasizing the role of inference and emotive meaning. Inference is essential to Berkeley's arguments in the *New Theory of Vision* that the size of objects is not directly perceived (25). Inference is also essential to the argument by design: just as one infers the existence of other minds on the basis of orderly physical movements in bodies that correspond to one's own, so there is still greater evidence in the orderly movement of the entire physical universe of the existence of a governing mind (34). Berman suggests Berkeley's account of emotive meaning—"that words and utterances can be meaningful even though they do not stand for ideas or inform, since they can be used to evoke emotions, attitudes and actions" (43)—is related to his immaterialism: "'Matter' is, in short, a perniciously emotive word, masquerading as a cognitive one" (32). "Matter" is used emotively, but transgresses the

pragmatic rules that emerge for the use of such emotive terms. As Berman later shows, those rules should be used only to promote good behavior.

The book continues its general delineation of the context of Berkeley's philosophy by reproducing reviews of Jonathan Bennett's *Locke, Berkeley, Hume* (1971) and George Pitcher's *Berkeley* (1977). These two reviews are early statements of the case that Berkeley was not thinking of Locke when writing against material substance, and that he had instead Hobbes and Descartes in his sights (60-61). It is worth noting that Berman again mentions Berkeley's liberation from Lockean semantics in this context (73).

The most substantial and consistent part of the book concerns Berkeley's relation to what Berman identifies as the only period of Irish philosophy, stretching from John Toland's *Christianity not Mysterious* in 1696 to Edmund Burke's *Philosophical Enquiry* in 1757. Berman here tries to show that Berkeley's work was shaped by two forces in Irish philosophy, theological representationalism and pragmatism, both closely tied up with Berkeley's views on language. Berman argues that Irish philosophy constitutes a school of theological representationalists (116-17), thinkers who argue that a finite being cannot have a clear and distinct idea of an infinite being, but that real knowledge of God is obtained through a knowledge of the effects of God in the physical world, effects that represent God sufficiently to gain knowledge of the divine attributes. Representationalism is used by William King to justify a pragmatic approach to Christian mysteries, such as the Trinity: "If theological statements can . . . produce practical theism, then they are true. They are not cognitively, but pragmatically true which is the valid sense of true for human beings in this life" (92). Berkeley is opposed to theological representationalism: "our (supposedly representative) notions either do or do not resemble their objects. If they do, then they give us proper knowledge of God. If they do not, then it is contradictory to say that the one is like the other. There is, Berkeley urges, no third possibility, no medium between likeness and non-likeness" (98). Yet the theory of emotive meaning developed in *Alciphron* achieves the same effects with regard to Christian mysteries as representationalism. Again Berkeley's linguistic thought is recognized as central to his entire philosophico-theological project. Berman singles out Swift, in his depiction of the academy of sciences at Lagado, and Burke, on the possibility of meaningfully using words without referring to clear and distinct ideas (understood as mental images), as sympathizing with or sharing Berkeley's non-cognitive view of language. It would have been interesting at this point to see Berman's responses to Roomet Jakapi's contention that Berkeley did indeed believe utterances concerning the mysteries of the revelation could be regarded as true or false.¹ The section closes with a consideration of Hutcheson's positive answer to the Molyneux question, based on the argument that figure, like number, is a real idea, and can be grasped through any of the senses by analogy; and an account of the impact of Irish philosophy in eighteenth-century America.

The final section of the book reproduces Berkeleiana first discovered or presented by Berman. These items include a description of an essay on the world as idea and spirit, to

¹ See Jakapi's "Emotive Meaning and Christian Mysteries in Berkeley's *Alciphron*," *British Journal for the History of Philosophy* 10 (2002): 401-11.

be found in *The Touchstone* (Cheapside: J. Noon, 1732); an account of the MS remarks of Mrs Berkeley in an interleaved copy of the 1776 *Life* that were only partially incorporated into later biographies; Berkeley's petition to the King requesting funds for St Paul's College; and a letter from George Berkeley Jr. to George Gleig, explaining the refusal to provide Samuel Johnson (of Lichfield) with biographical materials relating to his father. Berman presents four letters of Berkeley: one on tar water that contains an echo of *Siris*; a letter to Henry Clarke about a possible trip to Dublin; a letter to Orrery in part celebrating his talents, in part recommending Gilbert West's *Observations on the History and Evidence of the Resurrection* (1747); and finally perhaps Berkeley's last extant letter, written to Thomas McDonnell, who had wanted to answer Robert Clayton's *Essay on Spirit* (1750). The book closes with a consideration of the relationship of Berkeley to Samuel Beckett, in which Berman prefers appealing to Schopenhauer or Malebranche as sources for passages in Beckett that are often called Berkeleian, and notes Beckett's public denial that he learned anything about Berkeley from his tutor at Trinity, A. A. Luce.

This book is very useful in collecting Berman's important contributions to Berkeley scholarship, and in establishing the value of Berkeley's Irish context and later career for a full understanding of his work. Incorporation of responses to his critics alongside these essays when republishing them would have made the book richer still.

Tom Jones
University of St. Andrews
tej1@st-andrews.ac.uk

Review

Science et épistémologie selon Berkeley. Sébastien Charles, ed.
Sainte-Foy, Quebec: Presses de l'Université Laval, 2004. 177 pp.

Sébastien Charles has gathered together ten papers devoted to Berkeley's philosophy of science. The book is divided into three parts: the first is general ("Thinking: Philosophy of Science and Science according to Berkeley"), and the next two are more specific ("Understanding: Immaterialist Physics and Metaphysics"; and "Perceiving: Berkeley's Theory of Vision").

In the first essay, "Natural Philosophy and Religion: the Cases of Newton, Boyle and Berkeley," José Antonio Roblés indicates how Berkeley's thought, like that of Newton and Boyle, should be understood in the context of their apologetic aims. Although this argument is not new, it focuses our attention on the ways in which the religious interests of these three thinkers guide their scientific works (11). Roblés may not shed any new light on the authors considered individually, but his essay reminds us about the historical context in which their scientific activities were pursued.

The second essay ("Did Berkeley Anticipate the Problem of Induction?" by Atis Zakatistovs) proves that the empiricist tradition is not as consistent as might be expected concerning corpuscular science. Berkeley's anti-abstractionism leads him to an instrumentalist position opposed to Locke's realism. According to Zakatistovs, Berkeley considers a scientific concept only as a sign standing for a collection of sensations. To give a sense to the concept, one has to suppose that the sensations are regular. Such a concept has a signification only for *our* purposes. It is, in short, a "law of inferences" (32), not (as in the case of Locke's real essences) the real ground of our sensations. For Berkeley science is thus not deductive, and so his empiricist position necessarily gives rise to the problem of induction. Unlike Hume, though, Berkeley did not take it fully into account.

George Pappas's essay ("Abstract Ideas and *The New Theory of Vision*") ends the first part of the book. He shows that Berkeley's criticism of abstraction plays a central role in his thought from the beginning of his philosophical career. For example, "the thesis of the existence of abstract ideas, if it could be confirmed, would refute the essential positive ideas of NTV" (45). In that case, a general abstract idea would be common to several senses, which would contradict Berkeley's heterogeneity thesis. Furthermore, as Pappas plausibly argues, the existence of abstract ideas would be a proof of the distinction between primary and secondary qualities. By refuting the existence of abstract ideas, Berkeley deprives his opponents of an argument and thus strengthens his position.

Jean-Michel Vienne's essay ("Metaphysical Notions, Physical Notions") opens the second part of the volume. His aim is to show that Berkeley's use of the term "notion" is coherent. According to Vienne, the term is used to designate a mediate knowledge, a

knowledge attained either by effects or by the function of that term in a discourse. That is, it is a knowledge of the essence of something, but not of “the principle of the essence”—either because there is nothing else to know than the notion itself (i.e., what has been defined) or because activity cannot be represented. Notions are ultimately useful either theoretically or practically. But the convergence of their theoretical and practical functions should not hide a crucial distinction between the two kinds of notions, for theoretical notions denote, and practical notions do not. This distinction is central, because it allows Berkeley to maintain a substantialist ontology. One could wonder, however, whether this distinction is not more important than the convergence on which Vienne insists. And even if there were a real distinction between these two kinds of notions, it would not necessarily help us understand the specific issues addressed by each.

In the sixth essay, “Berkeley an Occasionalist in Spite of Himself? Of Causality in Malebranche and Berkeley,” Sébastien Charles studies Berkeley’s theory of causality in light of the *non sequitur* he attributes to Malebranchean occasionalism in the *Notebooks*. The problem here is that, according to Charles, Berkeley’s ontology leads him to a form of occasionalism (in which bodies are inactive); but at the same time, he maintains that all spirits are truly active (i.e., they are free). When attributed to finite spirits, though, such an activity remains mysterious. In particular, how is it possible for a finite spirit to cause ideas in another mind?—something that is implied by the fact that we supposedly move our legs ourselves. This suggests that Berkeley is not completely coherent here, but it is this important point that separates Berkeley from Malebranche. In Charles’ view, what distinguishes Berkeley and Malebranche is thus not only “a theoretical opposition concerning the nature of causality [but also] an anthropology and a theology” (86).

In the seventh essay (“Berkeley and the Theory of *Minima Sensibilia*”), David Raynor argues (contrary to most interpreters) that Berkeley’s *minima visibilia* are extended. He does not really give new and positive evidence for this claim (after all, Berkeley addresses the problem mainly in his *Notebooks*). But Raynor highlights some difficulties encountered by those who maintain that *minima visibilia* are unextended, particularly when evidence for that view was not necessarily endorsed by Berkeley. Moreover, Raynor makes his position more plausible by stressing the fact that Berkeley would not have been alone in holding such a doctrine, since Hume and Leibniz did so as well. Of course, Raynor’s position is not as sound as he thinks (which is again not surprising, considering how this is a problem that Berkeley does not explicitly address). But his criticisms are valuable, and they deserve to be answered in ways that are more sensitive to how arguments that are not clearly Berkeleian are often used.

In the eighth essay (“Microscopes and Visual *Minima*: Berkeley Critic of Instrumental Autopsy”), Philippe Hamou examines Berkeley’s position about microscopes in the context of a doctrine established toward the end of the seventeenth century (which Hamou calls the autoptical scheme). Berkeley criticizes the idea that microscopes would make vision “more perfect” (114) by pointing out that microscopes cannot modify visual acuity. As he puts it, it is not possible to see beyond the visual minimum, which defines the limit of perceptive consciousness. Instead, microscopes show another world. But that does not mean that microscopes are instruments that are any less scientific, for (in

Berkeley's account) science consists in linking ideas in ways that disclose natural regularities. Berkeley's conception of science is thus "operationalist" (123), because, for him, science consists in active engagement rather than in seeing passively.

In the ninth essay, Margaret Atherton aims to show "How Berkeley Can Sustain that Snow is White." She notes that there is nothing contradictory about saying that the real color of things is the color seen. To prove this point, she emphasizes (contra Margaret Wilson) Berkeley's arguments concerning color in the first part of *Dialogues between Hylas and Philonous*. According to Atherton, Berkeley wants to show that the perception of color does not have any objective counterpart. But this does not imply that there is no true color unless, like Hylas, one supposes that the true color of something is in the object perceived. Instead, Berkeley defines true color as the color which "varies regularly and in a predictable way" (139). Thus Atherton and Hamou agree on the interpretation of Berkeley's conception of science and truth: science does not reveal a world beyond appearances; rather, it allows us to associate more ideas.

In the tenth essay ("Vision and Geometry in Berkeley"), Dominique Berlioz examines Berkeley's position about the object of geometry, which is tangible and not visible. Indeed, as Berlioz acknowledges, visible objects are not organized in a Euclidean way; they are fleeting and heterogeneous. The sense of touch provides us with "the tactile experience of some objects in accordance with some definitions of Euclid's *Elements*" (151), but it still requires the imagination to create a geometrical space using diverse sensible data. At best, the visible shape is a sign for the tangible one; but it is a sign without reference, since the geometrical tangible object retains only some features of real objects. Geometry is thus not a copy of the world; it is rather a structuration of the world. But a question remains: what is the origin of the non-empirical parts of geometry? In answer to this, Berlioz suggests that geometry is a way of giving a form to sensible data that makes them intelligible and renders action easier.

Stephen Daniel ends the book with an afterward ("The Limits of Berkeley's Natural Philosophy"). He notes the "convergences" of the essays as a sign of the structure of the Berkeley's thought. According to Daniel, one of the main themes of Berkeley's enterprise is the setting of the limits of the diverse sciences. Such an operation requires a concept of limit, which, at the same time, articulates these domains of knowledge. By means of this process of grounding the sciences, each science is understood as legitimate in its domain because it is limited and linked to other sciences, particularly to the science that sets the limit. That is why the structure of Berkeley's thought should itself be seen as semiotic, in that the sciences themselves refer one to another.

This book gives a good and useful view of the state of interpretation rather than original research. Several elements contribute to provide this impression. First, the bibliography mentions only the works quoted in the essays, nothing more. It is impossible to consider it as a tool for research: it does not cover the whole field of the studies devoted to this aspect of Berkeley's thought. Secondly, many of its authors seem to admit that Berkeley had an instrumentalist conception of science. That deserves a more explicit discussion, particularly considering the volume's numerous affirmations concerning the truth of the

sciences. Lastly, and most surprisingly, there is not a word about *Siris*. Berkeley's last work is essential to understanding his position about the sciences; and it would have been interesting if contributors had discussed the book, half of which is devoted to medicine, chemistry, and philosophical reflection about the sciences. My criticisms, however, do not diminish the value of the collection, whose final merit is to present to the French reader studies that are generally available only in English.

Luc Peterschmitt
UMR "Savoirs, Textes et Langages," CNRS-Université Lille 3
luc.peterschmitt@wanadoo.fr

Review

John R. Roberts. *A Metaphysics for the Mob: The Philosophy of George Berkeley*.
New York: Oxford University Press, 2007. xx + 172 pp.

John Roberts argues that the key for understanding how Berkeley's metaphysical idealism is consistent with common sense lies in his account of spirits. According to that account, commonsense objects are considered significant or meaningful as objects of experience. Since nothing is meaningful apart from its place in a discursive context, all objects must be understood ultimately as expressions within a divine communication. Because communication is the proper domain only of minds, all intelligible objects of experience must be understood as intentional expressions of mind. Spirits, accordingly, are the active causes by which things in nature (i.e., ideas) are organized in terms of an interpretable language (84-85). It is this recognition of the essentially linguistic character of experience that allows spirits to know of the world and one another (xx).

To most readers, this way of summing up Berkeley's philosophy should not be too surprising. But Roberts uses it to turn Berkeley's celebrated pronouncement "*esse is percipi*" on its head, claiming instead that true *esse is not percipi* (5), because only spirits (i.e., persons) truly exist. He points out that if existence consists in something's being perceived and spirits are not perceived, then spirits cannot be said to exist. So to avoid thinking of the *esse* of spirits like that of ideas, Roberts proposes that, for Berkeley, only persons exist and ideas merely "subsist" (3).

Unfortunately, this way of speaking ignores how thinkers who thematize the distinction between "subsist" and "exist" (e.g., the Stoics) mean just the opposite. Roberts does not cite Berkeley's NB 429 remark that "existere is percipi or percipere," so he does not recognize how, drawing on Suarez's distinction between *esse* and *existere*, *existere* includes the being of both minds and objects in the world. No doubt, for Berkeley, the ontological status of spirits is not identical to that of ideas; but this does not mean (as Roberts suggests) that ideas have only a "secondary" status (126). Even though their being ideas depends on being perceived by some mind, their characterization as determinate ideas does not. That is why (as Roberts suggests) the appeal to the divine language argument is crucial. But instead of using the turn to the divine language to provide a semblance of autonomy to things in the world, Roberts describes Berkeley's use of the divine language as an indication of how objects exist only as functions of persons (83, 128).

Part of what drives Roberts's attempt to subordinate the ontological status of ideas to that of spirits is his concern with the Lockean "ideational" theory of language. According to that theory, a word (e.g., "spirit") is significant only if it refers to an idea (40-43). Roberts proposes that Berkeley early on seems to have adopted this position only to have quickly rejected it when he considered abstract ideas (52). In a similar way, Roberts imagines that Berkeley at one point flirted with the view that spirits might be understood as bundles of

ideas (xxi, 6-8). But here again, Roberts concludes that it is only Berkeley's endorsement of Locke's semantic theory that creates problems and makes his appeal to the concept of "notions" appear *ad hoc* (39).

But the problem here, of course, is not with Berkeley's struggle to accommodate Locke; it is with thinking that our understanding of Berkeley is enhanced by appealing to Locke's theory. Roberts concedes that Berkeley does not embrace Locke's semantics, but he then muddles his point by concluding that Berkeley nonetheless accepts some of the presuppositions of Locke's semantics (49-50). In terms of those presuppositions, spirits could be misunderstood as bundles of ideas. But once we wean ourselves away from using Locke as the filter through which to read the *Notebooks*, we can begin thinking of spirit as the activity of *identifying* ideas in relation to one another (i.e., "bundling" them). Readers of Berkeley do not therefore have to think that he ever maintained the so-called Humean bundle theory (7, 99, 103-4). Roberts does not consider this possibility because he reads Berkeley through Locke's eyes. That would explain why he reverts to the now discredited "standard reading" of the "+" sign, by which Berkeley supposedly expresses dissatisfaction with some of his *Notebook* entries on spirits (7, 112).

Of course, Roberts's strategy here is a common one—namely, claiming that we can get a "good, clean start" in describing Berkeley's basic views on existence "by locating them with respect to two traditions of the early modern period that inform and compete with his, those of Descartes and Locke" (8; also 9, 23). But once he imports Cartesian or Lockean treatments of abstraction, unity, substance, and existence into the discussion (13-37), he stirs up a dust in which Berkeley's distinctive views are quickly obscured.

Despite these methodological hindrances, Roberts comes up with several provocative insights about how Berkeley brings together his theories of spirits and the divine language of nature. For example, Roberts points out that, for Berkeley, we experience things as unities simply as a result of God's will (31-33). Contrary to what Locke says, we do not "selectively attend" to certain features of our experience to abstract the objects we perceive (57, 70), nor do we assume that the unity or existence of those objects is anything other than what we perceive. This commonsense apprehension of things forestalls efforts to discover supposedly more fundamental principles beneath what we experience. In this sense Berkeley proposes what Roberts calls a "Protestant semantics" in which the mob does not have to rely on the interpretations of scientific or philosophic priestcraft to know things in the world (52-53). Rather, common sense depends on understanding nature as a language of engagement and action (64-65).

This last point is central to Roberts's project, in that it highlights how the linguisticity of nature is also its mentality. To say, as Berkeley does, that ideas are signs of other ideas always already invokes the notion of mind because the activity of signifying is an act of mind (75-76). An idea can be *understood* only within a language, and a language indicates the presence of mind (77). From this Roberts concludes that thinking of an idea as an object means understanding it in the context of a mind using a language: "Treating the collection of ideas that constitutes a discourse as a suitable object of interpretation means we have to consider those ideas, those sensible things, *as being used by a spirit* for

the purposes of communication” (78). Nothing is intelligible, then, apart from its use in the divine discourse.

Here Roberts is close to an insight that would help him overcome the burden of the Cartesian notion of mind, but he never quite shakes off the view that spirits somehow must be things that are at least accessible reflectively (37). The final step would be to link mind and language *essentially*, making signification not only an indication of a mind’s activity but also the defining character of mind. That kind of move would fit nicely into Roberts’s scheme of portraying all objects ultimately in terms of what he calls “the personal stance,” in which objects of knowledge are linked intentionally and morally through spirit to reality as a whole (83). In such a view all things would be “appropriate targets of what are irreducibly evaluative activities” and could thus justifiably be called persons (128). In such a view, however, ideas are eclipsed by spirits. To maintain the ontological legitimacy of ideas would require abandoning the attempt to frame Berkeley’s account on a Cartesian or Lockean model. This, though, is something that Roberts is unwilling to do, because he thinks that immaterial simple substances have identities apart from the intelligibility of the objects they identify and associate (88-91).

Roberts thus argues that when we say of something that it is a spirit or mind, we do not “represent” or signify it; rather, we express a non-cognitive attitude toward it (80-82). That is, in thinking of a thing as an object of mind, we choose to think of it as an object of will, an object that is intended to be communicated. This apprehension of things as inherently intentional and necessarily related as signifiers and signifieds requires that we adopt what Roberts calls “the religious stance” (86-87), a stance in which we see all things as objects that are not only willed but also things for which the persons who perceive them are morally responsible (118-22). In this sense, the “religious stance” is the “personal stance.”

This way of speaking about the relation between minds and their ideas puts a strain on attempts to explain Berkeleian minds as either Cartesian substances or Lockean substrata. Nonetheless, Roberts tries to hang on to the Cartesian and Lockean accounts of mind, concluding that Berkeleian spirits are both Cartesian substances (though not Cartesian minds) and Lockean persons (though not Lockean substances) (88-90). The upshot of all of this is to make the Berkeleian notion of spirit a mishmash of views of his predecessors.

Thankfully, Roberts turns away from the “good, clean” dust-up provided by the filters of Descartes and Locke when he begins to describe Berkeleian spirits as the will that there be certain identifications and unities in our ideas (102). This shift away from thinking of will as something that someone *has* to what someone *is* indicates just how radically different Berkeley’s account is from Descartes’ or Locke’s (93-96). For Berkeley the essence or “very being” of a spirit is not to be a substratum in which experiences inhere, but rather it is to be the activity of assuming responsibility for those experiences (96, 100-4). Even in passive perception, this assumption of responsibility is an act of will, because it is a choice to interpret things in sign-signified relations (107-9, 118).

Here, of course, the question of occasionalism arises, in that it invites us to ask why we would intentionally will to interpret things in certain significant relations and not in others. That is, why would we adopt a certain perspective? Or why would we not adopt the religious stance? Those are the questions that one would have expected Roberts to have addressed in his penultimate chapter on occasionalism. Alas, that chapter shows only that if acts of will are understood as abstract occasions, then Berkeley is no occasionalist (122). Suppose, however, that occasionalism is not understood that way; then the question of how the possibility of freedom in human experience is compatible with divine sovereignty becomes really interesting. No doubt, Roberts's suggestion that Berkeley considers objects as images that (to use Wilfrid Sellars's term) "manifest" themselves *to us* as objects in *our* world brings Berkeley's immaterialism closer to common sense (129, 163). But in the end, what we want is an explanation of how it is possible to adopt a stance of faith in which we sense the communal character of a multiplicity of objects of experience. That would require a description of how the divine language of nature and the nature of mind are essentially linked. However, as long as the ghosts of Descartes and Locke are allowed to dictate strategies for interpreting Berkeley, that will not happen.

Stephen H. Daniel
Texas A&M University, College Station
sdaniel@philosophy.tamu.edu

Review

Robert Schwartz. *Visual Versions*.
Cambridge, MA: MIT Press, 2006. 277 pp.

Robert Schwartz's *Visual Versions* is a collection of essays on vision. It is organized in four main sections: the Berkeleian view of vision, perceptual inference, picture representation, and realist/non-realist commitments in visual perception studies. Most of the essays are already published but not easily accessible.

In this review I will concentrate on the first of the above mentioned sections. As in his *Vision: Variations on some Berkeleian Themes* (Oxford, Blackwell, 1994), the author uses elements of Berkeley's theory of vision to clarify contemporary theories and, conversely, contemporary theories to explain some problematic points of Berkeley's theory.

The first two essays are excerpted from chapters 1 and 2 of *Vision* and they serve to introduce the main themes of Berkeley's theory of visual perception of space.

The first essay deals with problems opened mainly by Berkeley's *New Theory of Vision* (hereafter *NTV*), sect. 2 where Berkeley writes "It is, I think, agreed by all that distance, of itself and immediately, cannot be seen. For distance being a line directed endwise to the eye, it projects only one point in the fund of the eye, which point remains invariably the same, whether the distance is larger or smaller." Discussing this section, Schwartz distinguishes three issues that it is important not to confound: (1) Berkeley's notion of distance; (2) the claim that visual perception of distance is not immediate; (3) the claim that in and of itself distance is imperceptible by sight. The author explains that "immediate" is here (as throughout the *NTV*) any perception which does not involve mental processing of any kind and which is a purely physiological process. According to the author, Berkeley thinks that distance cannot be immediately perceived by sight because of the one point argument. He then compares this thesis with some 20th century research results in the field (more precisely with experiences on retinal disparity) and asks if Berkeley was right or wrong. He concludes that information derived from retinal disparity is not enough to know the distance location of an object and, therefore, that Berkeley's stress on visual motor correlation is of great relevance.

The second essay deals with Berkeley's criticism of computational theories of visual perception of size. The author maintains that Berkeley's criticisms are still valid against contemporary computational models of visual perception of size.

The third essay is an explanation of Berkeley's notion of "minimum sensible" and a defense of its coherence. Understanding of this notion is achieved by introducing the main concepts involved in studies on phenomenal sense orders. In his *Notebooks* (hereafter NB), Berkeley characterizes the *minimum visibile* as the "simplest constituent or element" of visual extension, "wherein there are not contain'd distinguishable sensible parts" (NB 70, 439). In the essay, many puzzles about *minima visibilia* (arising mainly from propositions in NB) are discussed and explained. For example, take the case of whether *minima sensibilia* are extended or unextended. Schwartz distinguishes two different notions of "being extended." According to the first, something is extended if it has some phenomenal size; and since *minima sensibilia*, being uncomposed, have a phenomenal size of one unit, they have extension in this sense. According to the second, something is extended if it has parts; so since they are simple, *minima sensibilia* are, in this sense of the term *extension*, unextended.

The fourth essay is about Berkeley's heterogeneity thesis. According to this thesis: "The extension, figures and motion perceived by sight are specifically distinct from the ideas of touch, called by the same name; nor is there any such thing as one idea or kind of idea, common to both" (NTV 127). The explanation of the thesis is put forward with regard to number, distance, size and, most critically, figure. The author claims that visible figures and tangible figures share some basic definition without, however, being ideas of the same sort. According to the author, visual figures and tangible figures are of two different sorts because the phenomenal experiences of the two modalities do not resemble each other. The author proposes to solve the puzzle of ideas of figure sharing the same definition while and being at the same time of two different sorts by referring to Berkeley's distinction between general and abstract ideas. Visual and tangible ideas of, for example, a triangle could then be subsumed by the same general idea of a triangle and still be heterogeneous. In my opinion, the difficulty with this view is that, in Berkeley's definition, when two things can be ranged under the same general idea (which is not an abstract one), they are of the same sort and so they cannot be heterogeneous (cf. *Principles* 12).

The fifth essay treats again the question opened by the heterogeneity thesis by discussing "What Berkeley Sees in the Man Born Blind" (the title of the essay). Schwartz remarks that in the NTV, Berkeley tends to associate two different claims and to pass indifferently from one to the other. More specifically, Berkeley seems to think that if a connection between ideas is not necessary, it must be learned and vice versa. This association is responsible for the fact that from Berkeley on, discussions on heterogeneity are often indistinguishable from discussion on innateness. In this essay, Schwartz explains the heterogeneity between visible and tangible figures by maintaining that the visual field has a spatial structure, even if we do not always see this array as being of a certain figure: for example, we see "a circular array, although we do not *see it as* being circular" (75). The man born blind who recovers his sight does see some visual ideas of figure, but he does not see them as the same ideas he learned to perceive by touch. Visual extension and tangible extension are, in fact, incommensurable because both of them are based on a relation of "adjacency," but the

“next to” in visual space is not the same as in physical, tangible space. That is why visual figures and tangibles figures can be said to be heterogeneous even if in some cases a visible figure can be fitter than another in order to represent a tangible figure.

Laura Berchielli
University Blaise Pascal – Clermont-Ferrand, France
Laura.BERCHIELLI@univ-bpclermont.fr

News and Announcements

Invitation to participate in the
International Berkeley Conference
 at the Redwood Library in Newport, Rhode Island
 26-28 June 2008

The International Berkeley Society will sponsor a conference on Berkeley's life and thought at the Redwood Library in Newport, Rhode Island on 26-28 June 2008. The conference will feature presentations on various aspects of Berkeley's philosophy, as well as a reception at his home (Whitehall) and visits to places of interest such as Trinity Church (where Berkeley preached). Newport is especially active in the summer, and accommodations are usually very expensive. The conference organizers, however, have arranged for special rates at several bed-and-breakfast places near the Redwood so that participants and their families can enjoy this historic city and its attractions. To submit a proposal for inclusion on the program or for more information, contact Steve Daniel (sdaniel@philosophy.tamu.edu).

Invitation to participate in the
International Berkeley Conference
 at the University of Karlsruhe, Germany
 17-20 August 2009

George Berkeley (1685-1753) contributed to a wide range of academic disciplines; from philosophy to mathematics and empirical psychology; from theology to political economy and monetary policy. To celebrate the 300th anniversary of Berkeley's *An Essay towards A New Theory of Vision* (1709), we are now inviting distinguished scholars to give a diversified account of Berkeley's works with respect to his broad range of interest. The conference takes place at the Institute of Philosophy, the University of Karlsruhe, Germany. The conference is sponsored by the International Berkeley Society.

We herewith invite you either to read a paper, or to participate in a round-table discussion. It is important that we hear from you as soon as possible to arrange your place on the program. Let us hear from you before the end of April 2008 even if your plans are tentative so a preliminary program may be developed. The conference is organized by Wolfgang Breidert and Bertil Belfrage. For further information, please contact one of the organizers.

Wolfgang Breidert, Baumgartenstrasse 9, D-76316 Malsch, Germany.
Wolfgang.Breidert@gmx.de

Bertil Belfrage, Villan, S-57162 Bodafors, Sweden
bertil.belfrage@telia.com

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