NOTES

[1] Helmut Peukert, *Science, Action, and Fundamental Theology: Towards a Theology of Communicative Action*, translated by James Bohman (Cambridge, Mass.: The MIT Press, 1986) xxiii.

[2] See Michael J. Buckley, S.J., "Toward the Construction of Theology: a Response to Richard P. McKeon," *The Journal of Religion*, Supplement, 15, 58 (1978) 52-63.

[3] This paper is reworked and integrated into a much more extensive study of its thesis by the author in a work that was published in 1988 by Yale University Press, *At the Origins of Modern Atheism*. Because of its later date of publication this paper was able to incorporate the suggestions of the members of the conference at Castel Gandolfo and to respond to some early questions about the book.

[4] Galileo Galilei, *Dialogues Concerning Two New Sciences*, Third Day, Theorem VI, Proposition VI, Corollary III, translated by Henry Crew and Alfonso de Salvio with an introduction by Antonio Favaro (New York: Dover Publications, 1914) 194. As Stillman Drake remarks, the name "Simplicio" comes from the sixth century Greek commentator on Aristotle. See Galileo Galilei, *Dialogue Concerning the Two Chief World Systems*, translated with revised notes by Stillman Drake (Berkeley: University of California Press, 1974) 467-468n7.

[5] Galileo Galilei to Elia Diodati 9 June 1635, in *Commercio Epistolare di Galileo Galilei*, edited and illustrated by Eugenio Albèri (Florence: Società Editrice Fiorentina, 1859) II:57. Cf. Favaro, *op. cit.*, xi.

[6] Galileo, *Two New Sciences*, First Day, p. 2: "Sagredo: 'Now since mechanics has its foundation in geometry, where mere size cuts no figure, I do not see that the properties of circles, triangles, cylinders, cones and other solids will change with their size.'... Salviati: 'The common opinion here is absolutely wrong.... There are some intelligent people who maintain this same opinion, but on more reasonable grounds and cut loose from geometry....'" Salviati will insist that his contribution, which makes this a new science, is the introduction of demonstration by the geometrical methods proving his conclusions "in a rigid manner from fundamental principles." See *ibid.*, 6.

[7] Isaac Newton, *Philosophiae Naturalis Principia Mathematica*, "Actoris Praefatio ad Lectorem." The third and final edition (1726) of this work has been assembled and edited by Alexandre Koyré and I. Bernard Cohen with the assistance of Anne Whitman (Cambridge, Mass.: Harvard University Press, 1972) [henceforth cited as K-C], 1:15. All citations from the *Principia* have either been translated by the author or checked against the Latin text in his use of the standard English translation of Andrew Motte (1729), revised by Florian Cajori: *Sir Isaac Newton's Mathematical Principles of Natural Philosophy and His System of the World* (Berkeley: University of California Press, 1962) [henceforth cited as Cajori], xvii.

[8] James Collins, *Descartes' Philosophy of Nature* (Oxford: Blackwell, 1971) 61. Collins maintains that this statement is accurate enough for Descartes' general physics, but must be modified in the more differentiated and specialized portion of his scientific study.

[9] Pappus of Alexandria, *Synagoge* [*Collection*], 8, preface 1-3, in *Selections Illustrating the History of Greek Mathematics*, English translation by Ivor Thomas, Loeb Classical Library (Cambridge, Mass.: Harvard University Press, 1941) 2:614-620. Pappus makes quite clear that the understanding he is reporting is not one that is general among Greek theoreticians of mechanics by attributing it to the

school of Heron of Alexandria. For Heron, it is the movement of the point which generates the line, the movement of the line which generates the surface, the movement of the surface which generates the solid. The science which studied or described movements would lie at the basis of geometry. See Heron of Alexandria, *Mensauration: Definitions*, 14: 1-24 in *op. cit.* 2:468-469. Newton gives a similar description of the generation of the "quantitates mathematicas, non ut ex partibus quam minimis constantes, sed ut motu continuo descriptas, hic considero. Lineae describuntur, ac describendo generantur, non per appositonem partium, sed per motum continuum punctorum; superficies per motum linearum; solida per motum superficium; anguli per rotationem laterum; tempora per fluxum continuum; et sic in caeteris. Hae [sic] Geneses in rerum natura locum vere habent, et in motu corporum quotidie cernuntur." "Introductio ad Quadraturam Curvarum," in *Isaaci Newtoni Opera quae exstant omnia*, with commentary and illustrations by Samuel Horsley (London: Joannes Nichols, 1779-1785) [henceforth cited *Newtoni Opera Omnia*], 1:333.

[10] *Principia* 3, General Scholium, K-C 2:764; Cajori, p. 546.

[11] Isaac Newton, *Opticks, or a Treatise of the Reflections, Refractions, Inflections and Colours of Light*, 3, query 28, based on the 4th ed. (London, 1730/New York: Dover, 1952) [henceforth *Opticks*], 369.

[12] Newton to Bentley, December 10, 1762, in *The Correspondence of Isaac Newton*, edited by H. W. Turnbal (Cambridge: Cambridge University Press, 1959) 3:233.

[13] *Opticks* 3, query 28, 369.

[14] See Michael J. Buckley, S. J., "God in the Project of Newtonian Mechanics," in *Newton and the New Direction in Science*, eds. G. V. Coyne, M. Heller and J. Zycinski (Vatican City State: Vatican Observatory, 1988) 85.

[15] *Opticks* 3, query 31, 405-406.

[16] Isaac Newton, "A Short Schema of the True Religion," in *Sir Isaac Newton. Theological Manuscripts*, selected and edited with an introduction by H. McLachlan (Liverpool: University Press, 1950) [henceforth NTM] 48.

[17] Isaac Newton, "Seven Statements on Religion," *NTM*, 58.

[18] Newton, "A Short Schema of the True Religion," *NTM*, 48.

[19] *Ibid.*, 49 [enumeration added].

[20] *Principia*, preface to the first edition, K-C 1:16; Cajori, xvii-xviii.

[21] *Principia* 3, General Scholium, K-C 2:760-761; Cajori, 544-545. Newton puts his position precisely: "Deitas est dominatio Dei."

[22] Newton, *Opticks*, query 28, 369. It is critical to note that for Newton the only way in which one could posit a mechanical principle for the ultimate explanation of natural phenomena was by "feigning Hypotheses."

[23] James P. Ferguson, *An Eighteenth Century Heretic: Dr. Samuel Clarke* (Kineton: Roundwood, 1976) 23-25.

[24] Samuel Clarke, *A Demonstration of the Being and Attributes of God* (London: J. Knapton, 1705) [henceforth *DBAG*], "Preface."

[25] *DBAG*, 26-27 and 44-45 [italics his].

[26] Cajori, xxxiii.

[27] *DBAG*, 111-112ff [italics his].

[28] *DBAG*, 126.

[29] Leonard Lessius, *De providentia numinis et animi immortalitate, libri duo adversus Atheos et Politicos* in the *Opuscula Leon. Lessii, S.J.* (Paris: P. Lethielleus, 1880). ET: *Rawleigh His Ghost: Or a Feigned Apparition of Syr Walter Rawleigh, to a friend of his, for the translating into English, the Booke of Leonard Lessius (that most learned man) entitled De providentia Numinis, et Animi immortalitate; written against Atheists, Polititians of these days*, 1558-1640, edited by D. M. Rogers (London: Scholars Press, 1977) 1.1, 5.