

JONATHAN EDWARDS AND DETERMINISM

RYAN D. TWENEY

This paper argues a new interpretation of Jonathan Edwards's psychological account of human action. In *Freedom of the Will* (1754), Edwards adapted a sophisticated version of Newtonian determinism to the understanding of human thinking and action. Rejecting a mechanistic determinism, in which antecedent faculties "cause" actions, Edwards instead advocated a systemic view. Thus, rather than the "greatest apparent good" causing the "will," which in turn caused an action, Edwards claimed that "The will is as the greatest apparent good," thus grounding a systemic and dynamic account. Misunderstanding of his view has led to much confusion and a failure to properly locate Edwards within the history of American thought. © 1997 John Wiley & Sons, Inc.

Jonathan Edwards (1703–1758), sometimes regarded as the first of America's indigenous psychologists, has received much attention from historians interested in the development of American thought. A recent bibliography¹ lists 651 studies published between 1979 and 1993, including 91 dissertations! Nonetheless, in spite of the enormous secondary literature, he remains a difficult figure to assess, especially since his works have often been taken as legitimating one or another theological preconception. In fact, little has been done to trace the specific influence of his ideas on later American *psychological* thought, and much of what has been done has missed one of the crucial aspects of his influence.²

The present paper will attempt to establish a reading of Edwards focused upon his concept of determinism. The huge literature on Edwards by modern scholars (dating, roughly, from the appearance of Perry Miller's seminal intellectual biography in 1949), while rich and provocative, is confusingly full of alternative conceptualizations of the nature of his system of mental philosophy.³ In the usual view, Edwards is seen as trying to apply Enlightenment insights and methods to the knotty problem (endemic in all Calvinist thought) of reconciling predestination—the logical consequence of a truly omniscient and omnipotent god—with the need to persuade sinners to reform their ways. How, in short, could moral imperatives be made to work if one's ultimate salvation or damnation were already divinely decided? The early Puritan colonies provided a partial answer by establishing a strict theocracy, in which "Visible Saints" made the important social and political decisions, as well as the religious ones, but this system was breaking down under the pressure of economic growth and the growing diversity of New England.⁴

Edwards reset the Calvinist debate upon psychological grounds. He thus resolved some theological dilemmas, opening the way to the so-called "New Divinity," but he also established a new way to conceive of the workings of mind.⁵ As part of his defense of Calvinism, Edwards argued that all human thought and action was causally determined and that there was no such thing as "free" will. The goal was to defeat what he regarded as the heretical tendencies of Arminianism, the doctrine that sinners could choose to do right, thereby meriting salvation by their own efforts.⁶ Written toward the end of his life, the best statement of

RYAN D. TWENEY is Professor of Psychology at Bowling Green State University, Bowling Green, Ohio 43403, email: tweney@bgnet.bgsu.edu. His major interests are in the application of cognitive historical models to the understanding of scientific thinking. In addition to a number of papers, he is the editor of a previously unpublished notebook by Michael Faraday (London, 1991).

his position is the 1754 book, *A Careful and Strict Enquiry into the Modern Prevailing Nations of That Freedom of Will, Which is Supposed to be Essential to Moral Agency, Virtue and Vice, Reward and Punishment, Praise and Blame*.⁷ Although the book was surprisingly “secularized” in its arguments, it was also part of a larger programmatic attempt to justify Calvinist predestinarianism in the face of what Edwards saw as an increasingly virulent Arminianism.

Edwards’s *Enquiry* is only part of a larger argument. Three works are of special significance for an understanding of his psychological views: the *Treatise on Religious Affections* of 1746, in which Edwards sought to delineate the signs by which true conversion could be known, the *Enquiry* of 1754, in which the Arminian account of will was refuted, and *The Great Christian Doctrine of Original Sin Defended* of 1758, a kind of “empirical” investigation of human conduct.⁸ Taken together, the three provide a complete “Calvinist Psychology,” in which the first establishes the uncertainty of who can be regarded as “saved” or “not saved,” the second locates human thought and action within a naturalized (and deterministic) universe, and the third sets out a descriptive approach to the actual nature of sinful human conduct.⁹

Commentators differ in the particular aspects of Enlightenment thought that Edwards reflected. One of three major emphases (not necessarily mutually exclusive ones) are found in most of the secondary literature on this issue: (1) that Edwards was primarily a follower of Locke (usually attributed to Perry Miller but also the main point of Foster), (2) that he was primarily a follower of Berkeley (first suggested by Fraser in 1871, though later retracted by him), and (3) that he was primarily a mystic (noted by Woodbridge Riley and many of the theological commentators).¹⁰ In recent years, a larger number of sources has been identified, including some outside the tradition of specifically British thought. Most notably, Fiering argued for a strong influence due to More and Malebranche, as well as other 18th century moral philosophers.¹¹ Yet, however tangled the intellectual origins of Edwards’s thought, he did specifically ground the *Enquiry* in Locke’s formulation: thus, for example, Locke is frequently discussed in the *Enquiry*, whereas neither Berkeley nor Malebranche is mentioned. In this respect, Edwards followed the common practice of his day. As Alice Baldwin noted in a survey of works cited in sermons by pre-Revolutionary New England clergy, Locke was second in citations only to the Bible!¹²

In the present paper, I locate Edwards’s deterministic psychology with respect to the systemic determinism associated with Isaac Newton. Newton is mentioned frequently in Edwards’s unpublished scientific writings, which deal extensively with physical topics.¹³ However, the context of the *Enquiry* makes it more difficult to see its Newtonian roots. Furthermore, insofar as Locke was himself responding to issues created by the success of Newton’s *Principia*, my argument will also clarify the extent to which Edwards can and cannot be said to be a Lockean.

NEWTON AND DETERMINISM

Isaac Newton (1642–1727) revolutionized physical science by showing how a specific formulation of the laws of motion could account for both the lawful behavior of moving bodies subjected to forces, extensively studied since Galileo’s time, and the similarly lawful (but phenomenologically very different) planetary motions of the solar system. In many respects, Newton’s *Principia* was the epitome of Enlightenment thought: “Newtonianism,” the belief that similar law-based syntheses were possible in all realms of knowledge, was important to many 18th century works on human nature and society.¹⁴

American colonial thought was heavily influenced by the Newtonian synthesis. In spite of their overwhelming commitment to religious foundations of knowledge, colonial thinkers were not hostile to scientific approaches. In fact, the reverse was true; the new scientific results that flowed from the 17th century scientific revolution were closely followed by a number of theological thinkers in America and, in some cases, were incorporated with surprising speed into sermons, tracts, and public political discourse.¹⁵ Such Puritan “science” was frequently very provincial. For example, a peculiarly deformed cabbage root led Cotton Mather to interpret it as an omen; in Michael Winship’s words: “Mather later grasped its meaning . . . when war subsequently broke out with the Indians.”¹⁶ More seriously, in 1745, Cadwallader Colden explicated a presumptive explanation of the causes of gravity, whereas Thomas Prince, in a 1727 sermon, used scientific accounts from the *Transactions* of the Royal Society to account for earthquakes and droughts.¹⁷

One way to interpret Newton’s achievement is to claim that insofar as he separated the question of what gravity actually *is* from the question of *how it works*, he further separated metaphysical approaches from those that we would now regard as scientific. In the *Principia*, what counts for the demonstration is acceptance of the laws of motion, namely, that bodies continue in a state of rest or motion unless acted upon by a force, that the change in motion caused by a force is proportional to the force and inversely proportional to the mass of the moving body (expressed in the familiar equation, $F = m a$), and that every action is accompanied by an equal and opposite reaction. “Force” here, like mass and like motion, is a primitive term not itself explained by the theory. The forces between masses are assumed to operate across empty space; thus, Newton’s account presupposes “action at a distance.”¹⁸ Given these starting points, the bulk of Book I of the *Principia* is concerned with a mathematical exposition of theorems that follow from the axioms concerning the nature of motion, while Book III demonstrates that the motions of the earth, planets, and comets can be fully described by the principles laid out in Book I.

Newton’s conception of the physical universe is very different from the mechanical linkages that constitute the Cartesian universe.¹⁹ Descartes’ physics relied upon “vortices” of “subtle matter” to account for gravitational influences and regarded forces as “occult” hypothetical entities. The transmission of force, for Descartes, could occur only through contact action, a “push–pull” universe. If the earth attracted the moon, then there had to be some intermediary matter to convey the gravitational force—hence the vortices that caused the moon to be “dragged along” in their wake. By contrast, Newtonian dynamics required inverse square-law forces acting across space to account for the interaction of noncontiguous bodies. Newton, in the *Principia*, offered no explanation of what causes the forces; “I have not been able to discover the cause of those properties of gravity from phenomena, and I frame no hypotheses.”²⁰ But he is clear about the Cartesian vortices: Book II of the *Principia*, which deals with the motions of bodies in a resisting fluid, is a demonstration that the attractive forces of gravity cannot be due to such mechanisms: “[T]he hypothesis of vortices is utterly irreconcilable with astronomical phenomena, and rather serves to perplex than explain the heavenly motions.”²¹

In England, Newton’s displacement of Cartesian physics quickly gained acceptance among natural philosophers, a process that was delayed elsewhere, especially in France. Of particular note are the arguments leveled against Newton’s synthesis by Leibniz; for him, Newton’s use of action at a distance was an absurd introduction of an “occult quality.” Furthermore, Leibniz was not sympathetic to the notion that metaphysical concerns could be left unresolved by accounts that concentrated on the “how” of gravitational motion. Newton was defended by Samuel Clarke in a series of letters exchanged with Leibniz between 1705 and

1716 and published in 1717.²² To be sure, and in spite of his disclaimer (“I frame no hypotheses”), Newton did engage in speculation about the causes of gravity. But he rejected the notion, one that Leibniz shared with Descartes, that one had to specify those causes before any meaningful physical account could be given; it was enough to show *how* gravity worked, leaving the question of its ultimate nature for other inquiries. Thus, in the Preface to the 1717 edition of the *Opticks*, Newton said “And to shew that I do not take gravity for an essential property of bodies, I have added one Question concerning its cause, chusing to propose it by way of a Question, because I am not yet satisfied about it for want of experiments.”²³ In the Question itself (Question 31), Newton speculated on the ultimate particles of matter and on their properties, considering the possibility that these particles “are moved by certain active principles, such as is that of gravity. . . . These principles I consider, not as occult qualities, supposed to result from the specific forms of things, but as general laws of nature . . . ; their truth appearing to us by phaenomena, though their causes be not yet discover’d.”²⁴

In spite of his own caution, Newton’s account was read as having both metaphysical and theological import.²⁵ For many “Newtonians” his principles quickly became assimilated to arguments in favor of a mechanistic “clockwork” universe, one in which all phenomena were the result of the motions of contiguous bodies. The analogy between the workings of a clock and the workings of the universe was not new (and had been used extensively by Descartes), but the Newtonian synthesis seems to have given it new life; for Newton, it was used in the claim that the principles of mechanics seemed insufficient to account for all of the properties of the universe (as in the *Optics*, Questions 28 and 31); Newton felt that god would in fact have to “rewind” the solar system from time to time to preserve its stability.²⁶ Leibniz made much of this view of Newton’s, perhaps with a sarcastic awareness that analogizing Newton’s universe to a clock was a subtle commentary on Newton’s concept of absolute time (with which Leibniz disagreed): “Sir Isaac Newton, and his followers, have also a very odd opinion concerning the work of God. . . . God Almighty wants to wind up his watch from time to time: otherwise it would cease to move. . . .”²⁷ After the mid eighteenth century, and especially when Newton’s ideas took hold in France, such clockwork conceptions advanced rapidly. It is thus important to note that the context of “Newtonianism” when Edwards wrote his *Enquiry* in 1754 included a range of positions, from “mechanistic” accounts that, like Descartes’s, relied upon contact action, to idealistic accounts (Clarke, Berkeley) which placed an immanent divine principle into every physical event.

It is important to keep the variety of these accounts, all of which are “Newtonian,” in careful focus; failure to do so has confused most of the previous scholarship on the role of science in Edwards’s thought. In particular, consider the relationship among the three terms *mechanism*, *materialism*, and *determinism*. Determinism is the most general of these, with the “Two M’s” representing specific types of determinism:

Determinism: The view that processes are determined, that is, that the state of a process at time $t + 1$ is a function of its state at time t .

Mechanism: The specific deterministic view that physical processes occur by the direct transmission of force among discrete bodies in contact.

Materialism: The specific deterministic view that all processes are a manifestation of the properties of matter.

Note, first of all, that materialism is a determinism that makes a specific ontological claim; it is consistent with mechanism, though in principle the two positions do not necessitate each other. For the present argument, the more important distinction is between deter-

minism in general and mechanism in particular. To see that these are in fact different positions, consider a “Rube Goldberg” device in which a button press initiates a series of mechanical actions (a swinging pendulum, a train of rolling ball bearings, etc.); these ultimately lead to a match being struck. The device is mechanistic because each effect depends upon a preceding cause which is discrete and separable; the button *causes* the pendulum to swing, which *causes* the wheel to turn, and so on. Such a device is, of course, a deterministic system, in that each state of the system at time t is determined by the state of the system at time $t - 1$. Now consider the laws of motion that govern the path of, say, a cannonball. This, too, is a deterministic system, like the mechanical device, but the motion of the cannonball does not itself amount to a mechanism, in spite of the fact that the mechanism of the cannon initiated its motion. Once in flight, however, the trajectory of the ball does not depend, as “effect,” upon the prior occurrence of a “cause.” Instead, the equation of motion is a description of a continuous dynamic event; by solving the equation, one can predict where the ball will land, how fast it flies, and so on, but it is a mistake to regard the motion as “mechanistic.” More usefully, the ball should be seen as part of a deterministic *system* in which the laws of motion relate the observed motions in time to the dynamic unfoldings of the relevant forces and masses.

Clearly, Newton’s system is deterministic, but it is not so clear that it is either materialistic or mechanistic; the notion of action at a distance would seem to make it non-mechanistic, unless one posits the existence of an intermediary physical and/or material ether. While Newton toyed with an ether idea in the *Opticks*, he came to no committed position. Just as clearly, Newton was uncomfortable with materialist interpretations of his system. In spite of his qualms, however, by the middle of the 18th century, many British and French Newtonians had accepted materialism as a fundamental premise.²⁸ The significance of these distinctions for Edwards must be understood: Edwards was very clearly a determinist, very clearly not a materialist, and (the principal argument of the present paper) *not a mechanist*.²⁹

JOHN LOCKE

The determinism that Edwards inherited from Newton is relevant to his use of Locke as well. For John Locke (1632–1704), whose work was often paired with that of Newton,³⁰ the recent successes of the scientific revolution—Newton’s *Principia* in particular—meant that it was necessary to ask how human knowledge was possible on such a grand scale; how, in short, we could create a psychological system of understanding that made abstract knowledge possible. Locke can thus be seen as the “epistemological” or “psychological” counterpart to Newton; and, like Newton, he inspired Leibniz to write an extensive reply (which, however, was not published until 1765).³¹

In seventeenth century England, events such as the founding of the Royal Society signaled a new emphasis on the clarity of demonstration, through both experimentation and clear, precise argument.³² Locke’s own scientific researches reflected this emphasis. Thus, both Locke and Edwards were staunch advocates of the “plain style” of speaking and writing. Like John Wilkins, a founding member of the Royal Society, both were concerned that discourse, like preaching, be “Plain and natural, not being darkened with the affectation of scholastical harshness, or rhetorical flourishes.”³³ For Locke, concern with the precise signification of words was a major consequence of his theory of ideas; all of Book III of the *Essay* is centered upon this problem.³⁴ Edwards continued this concern, a fact reflected in the careful use of terms throughout the *Enquiry*, and his reliance upon arguments having as their basis a close analysis of the meanings of such words as “will” and “liberty.” Considerations

of rhetorical style were, of course, central to someone as gifted in preaching as was Edwards, and it is interesting to note that the avoidance of metaphor, so characteristic of his style in the *Enquiry*, did not extend to his sermons—as the famous example of Edwards’s comparison of the depraved sinner to a “loathsome serpent” or a spider in *Sinners in the Hands of an Angry God* makes clear! Finally, the clarity of mathematical demonstration is itself, like the clarity of a properly conducted experimental result, part of a social context of persuasion. Thus, the very fact that Newton’s achievements were seen as dependent upon his use of mathematics served as a further warrant for their truth. Edwards was no mathematician, but he was a clear and precise thinker. It is thus not farfetched to suggest that, even more than for Locke, Edwards’s emphasis on precision of argument is “Newtonian.”

Edwards accepted Locke’s psychological explanation of the relation between objects, ideas, and knowledge. Most importantly, Edwards drew from Locke the distrust of faculty formulations of mind; in Locke’s words, “If it be reasonable to suppose and talk of faculties, as distinct beings, that can act, . . . ‘tis fit that we should make a speaking faculty, and a walking faculty, and a dancing faculty, by which those actions are produced.”³⁵ To elaborate upon the causal sequence that produces particular actions, Edwards took Locke’s account of the will as his starting point: “Mr. Locke says, ‘The will signifies nothing but a power or ability to choose.’”³⁶ Locke’s notion of the will as a power was an important part of his position; since he also regarded freedom as a “power or ability to chuse.” It followed that it made no sense to speak of the “freedom of the will,” since that would be to predicate one power or ability of another power or ability. Locke argued that voluntary action was a product of “the will” acting upon knowledge of the results of an action, but he made clear, as in the quote about the singing and dancing faculty, that “the will” was not to be taken as an independent entity but rather as a “way of talking.”³⁷ Both Locke and Edwards thus subsequently refer to “the” will, although, according to Locke, “It is the Mind that operates, and exerts these Powers; it is the Man that does the Action.”³⁸

For Locke, the question of the freedom of the will was moot, an issue that could arise only if the will were regarded as an autonomous, separable, agent or faculty of mind. Instead, rejecting a faculty view, Locke argued that we are free insofar as we can postpone choosing long enough to examine and reflect upon the consequences of a choice. Such a solution, in effect, externalizes the question of freedom of the will; freedom to choose, as defined by the presence of actual alternative choices of action and the actual ability to carry out the relevant alternatives, is the essential condition of freedom, not a psychological entity possessing special properties. In this respect, Edwards’s account of the will is precisely Lockean.

EDWARDS’S DETERMINISM

It was noted earlier that Edwards’ account of the will was deterministic but was not committed to materialism and was not mechanistic. This distinction is important. Without it, a good deal of misunderstanding can result. For example, because Edwards is not a materialist, some have inferred that he was not a Newtonian, a position that makes sense only on the specific reading of Newton as a materialist. Edwards, of course, was not writing a treatise on physics, and the point may therefore seem unimportant. Yet, on my reading, confusion on the issue is consequential for the interpretation made of Edwards’s psychology. For example, Jon Pahl held that Edwards occupied a moderate position, in which “the compulsion of determinism” was characteristic of natural necessity but not moral necessity. Pahl thus confused both the nature of determinism and the distinction made by Edwards between natural and

moral necessity. Similarly, Norman Fiering argued that “everything Edwards ever said about causation and the order of the universe was already to be found in the philosophical speculations of the Cartesians before Newton published a word.” Yet, as I have shown earlier, Cartesian physics was mechanistic, whereas Newton’s (and Edwards’s) was not. Thus Fiering’s claim that there are Cartesian sources for Edwards’s notions of causality is unsupportable.³⁹

There has also been resistance to the claim that Edwards worked in a Lockean context. Thus, perhaps because he is insistent upon characterizing Edwards as a “mediator” between extremes, Pahl denied that Edwards was opposed to faculty conceptions: “Perry Miller initiated the tendency to see Edwards’s conception of the human as ‘unified,’ and while I to some extent agree, at times the emperor seems to be wearing no clothes. Edwards used faculty language freely, and this linguistic fact can only be evaded to a point.” Pahl then argued that, since Edwards can be said to have an implicit faculty concept of will, then that will can be said to be “free.”⁴⁰ Such a claim ignores Edwards’s own strictures about his terminology, denies a fundamental methodological presupposition in all of Edwards’s writings concerning precision of language, and renders impossible any consistent interpretation of the responses to Edwards. My reading is consistent with Blight and with Miller, not Pahl, in this regard. In general, the recent attempts to rescue Edwards from the consequences of his determinism appear to be motivated by a larger agenda, using Edwards to justify a “kinder and gentler” Calvinism. But no such rescue is possible unless Edwards’ use of determinism is systematically misread.

Like Locke, Edwards externalized the issue of freedom, but his determinism was more explicitly drawn than Locke’s: “By ‘determining the will,’ if the phrase be used with any meaning, must be intended, causing that the act of will or choice should be thus, and not otherwise.”⁴¹ Further, the act of will was construed in a *proximal* fashion, rather than globally, in terms of the longer-term goal of the act: “The thing nextly chosen or preferred when a man wills to walk, is not his being removed to such a place where he would be, but such an exertion and motion of his legs and feet, etc., in order to it.”⁴² For Edwards all thought and all action must be understood as determined. Rather than being “free” in the sense of “undetermined,” the will was itself part of a causal nexus that included the understanding and the “inclinations” or “affections.” Edwards was very careful in phrasing his account; thus, perhaps the most important passage in the *Enquiry* is the following:

I have rather chosen to express myself thus, *that the Will always is as the greatest apparent good, or as what appears most agreeable, is*, than to say that the Will is *determined* by the greatest apparent Good, . . . because an appearing most agreeable or pleasing to the Mind, and the Mind’s preferring and choosing, seem hardly to be properly and perfectly distinct.”⁴³

Edwards’s view of human action thus emphasized the unitary nature of mind and action, a kind of naturalism that opposed the intellectualistic separation of intellect from affect, or of either from will:

[I]t is that motive, which, as it stands in the view of the mind, is the strongest, that determines the will. . . . By “motive,” I mean the whole of that which moves, excites or invites the mind to volition, whether that be one thing singly, or many things conjunctly.”⁴⁴

Note that any simplistic mechanical causation (“First comes the motive, then comes the decision, then comes the action”) is inconsistent with this view. Far from being a mechanical determinist, Edwards argued for a systemic determinism in which a variety of causal factors operate continuously to produce the proximal, moment-by-moment, phenomena of human

action. In effect, Edwards adopted a process-oriented view of the nature of human action, and a view that emphasized the importance of the *microstructure* of human action.⁴⁵

In elaborating upon his notion of cause, Edwards made a distinction between cause as “that which has a positive efficiency or influence to produce a thing,” versus causes which “have truly the nature of a ground or reason why some things are, rather than otherwise. . . . Thus the absence of the sun in the night, is not the cause of the falling of the dew at that time, in the same manner as its beams are the cause of the ascending of the vapors in the daytime.”⁴⁶ In Aristotelian terms, it is tempting to say that Edwards thus distinguished between the efficient cause and the formal and/or material causes, the latter being generally undifferentiated by Edwards. In terms of his complex view of the causes of human action, however, Edwards was not relying upon efficient causality, nor was he explicit about how to separate the “ground” from the “reason.” In fact, Edwards rejected an Aristotelian notion of causation. Further, because of the dynamic character of his account of action, he in effect rejected any kind of simple “typology” of causes, Aristotelian or otherwise. Instead, causation was a matter of “necessary connection,” in which antecedents were necessarily followed by their consequents. The sophistication of Edwards’s causal theory was captured by Guelzo: “One can no more say that the will is ‘caused’ by perception than one can say that a bird is ‘caused’ to lay eggs—our definition of ‘bird’ implies egg-laying. Moral ‘cause’ is only connection, consequent following on its antecedent.”⁴⁷

In a famous example, Edwards described a drunkard seated before a glass of drink.⁴⁸ If he chooses to drink, then it is the apparent good of the drink’s effects that determines the choice. But if he chooses not to drink because of an intent to abstain, then he has merely substituted the virtue of abstinence for the immediate pleasure as the “greatest apparent good.” In both cases, the chosen action is part of a deterministic system which is relentlessly causal. To resolve the Calvinist dilemma, i.e., to show that we could still blame or praise the drunkard depending on his choice—in spite of the strict determinism behind either choice—Edwards argued that it was possible to blame or praise because the determinative aspect of the person’s inclination was itself praise or blameworthy. Thus, even though the drunkard cannot help drinking, he can be blamed for drinking because the drinking is a reflection of a blameworthy moral character; the drunkard’s character is the “ground or reason” of the choice.

For Edwards, a distinction needed to be drawn between “natural necessity” and “moral necessity.” Blame and praise could be applied only in the moral realm, of course, but Edwards was explicit in arguing that the distinction between the two kinds of necessity was based on the nature of the things connected, not on the nature of the connection. That is, an event was seen as naturally necessary if it could not be otherwise than it was, given some antecedent natural events. Similarly, a morally necessary act was one that could not be otherwise than it was, given some antecedent moral events. For Edwards, the kind of necessity embodied in both cases was the same; again we see a clearly naturalized view of human action. Why then did he require a distinction between the two kinds of events? Because, said Edwards, one needs to define the domain of moral events in order to justify the allocation of praise and blame! That is, theological presuppositions, and the central Calvinist dilemma, require the distinction; it is *not* demanded by the requirements of an adequate scientific or philosophical account of the will.

In the final analysis, Edwards’ careful account of the operations of the will is especially notable because of the sophistication of his analysis of causation. While he agreed with Locke that a faculty approach is inadequate, his determinism was more sharply drawn than Locke’s. Edwards did not simply posit “a” cause for “an” effect, nor a “set” of causes for a

“set” of effects; instead, his analyses emphasized the importance of considering the entire deterministic framework of each human action. Ultimately, for Edwards, the first cause of all events was divine, of course, but the process by which events played out was rich, varied, and spread across time. In this respect, Edwards reflected the Newtonian heritage; for Newton also, causality was not simply a matter of finding “the” cause but instead involved the dynamic description of the operation of laws. Thus, it is not sufficient to characterize the orbit of the moon as “caused” by gravity. Instead, Newton showed that a full account, as manifested in the particular equations of motion of the moon’s orbit, requires a demonstration that the empirically determined equations can be derivationally related to the underlying laws of motion. The equations of motion that describe the moon’s orbit can then be seen as manifestations of the underlying laws of motion. In effect, the deterministic earth-moon system “is as” the equations of motion (to purloin Edwards’s phrasing). By analogy, Edwards’ account of the operation of the will can be seen as showing that the moment-by-moment dynamics of human action reflect the operation of the underlying laws of cognition; thus the will “is as” the greatest apparent good.

The systemic nature of Edwards’s account of causality, and its close relation to Newton’s views, is clearly revealed in his response, in Part IV of the *Enquiry*, to Isaac Watt’s *Essay on the Freedom of the Will in God and Creatures*.⁴⁹ Watts (1674–1748), who may have served Edwards as a “stand-in” for Leibniz, had based part of his argument for the freedom of the will on the question of whether there were things chosen by god that were matters of perfect indifference; atoms, for Watts, are such entities—since they are perfectly alike, there would be no reason to prefer one over another. The choice, therefore, is one in which “the most High, in some instances, chooses to do one thing rather than another, where the things themselves are perfectly without difference.”⁵⁰ It thus followed that divine free will *does* exist; God was not bound by necessity to have chosen the one over the other and thus God, at least, possesses a truly free will. To refute this claim, Edwards argued that even on the assumption that atoms are all alike, they must necessarily differ in place: further, “If the laws of motion and gravitation, laid down by Sir Isaac Newton, hold universally, there is not one atom, nor the least assignable part of an atom, but what has influence, every moment, throughout the whole material universe.”⁵¹ Given this, the effects on other atoms could not be identical but would be a function of their position; they are therefore not identical atoms in the relations that they bear to other parts of the material world. Edwards does not miss the chance to place this rather abstruse bit of physical theory in a broad context:

To illustrate this, let us suppose two bodies moving the same way, in straight lines, perfectly parallel one to another; but to be diverted from this parallel course, and drawn one from another, as much as might be by the attraction of an atom, at the distance of one of the furthest of the fixed stars from the earth; these bodies being turned out of the lines of their parallel motion, will, by degrees, get further and further distant, one from the other; and though the distance may be imperceptible for a long time, yet at length it may become very great. So the revolution of a planet round the sun being retarded or accelerated, and the orbit of its revolution made greater or less, and more or less elliptical, and so its periodical time longer or shorter, no more than may be by the influence of the least atom, might in length of time perform a whole revolution sooner or later than it otherwise would have done; which might make a vast alteration with regards to millions of important events. So the influence of the least particle may, for ought we know, have such effect on something in the constitution of some human body, as to cause another thought to arise in the mind at a certain time, than otherwise would have been; which in length of time (yea, and that not very great) might occasion a vast alteration through the whole world of mankind.⁵²

The passage implicates virtually the entire universe in a web of continuous causal relationships. God could not, in such a universe, have made a “free choice” between two “identical” atoms since their placement in space might occasion a “vast alteration” and thus provide a difference in the goodness of the outcome. Note too that the question of the determinants of human action, in such a universe, is rendered exceedingly complex. For Edwards, the problem of the will is approached via a Newtonian *world* view. For Edwards, as for Newton, gravitational forces act at a distance, extend to infinity, and constitute an affirmation of the deterministic character of everything that exists and everything that happens.

The ultimate nature of gravitational force did not trouble Edwards; for him, as for Henry More and Samuel Clarke, the “cause” of gravity was to be found in the divine realm.⁵³ In an unpublished manuscript, Edwards considered the cause of the nature of substances, a nature that included gravitational attraction:

The reason why it is so exceedingly natural to men to suppose that there is some latent substance . . . that upholds the properties of bodies [N.B.—as do the Cartesians], is because all see at first sight that the properties of bodies are such as need some cause that shall every moment have influence in their continuance. . . . [M]en are wont to content themselves in saying merely that it is something; but that ‘something’ is he by whom all things consist.

Such a resolution of course supports the judgment of Edwards as ultimately an idealist, resembling in this respect Berkeley even if his psychological account is closer to that of Locke.⁵⁴

In the final analysis, Edwards thus advocated a kind of causality that works in exactly the same fashion whether we are considering human actions or planetary motions. We can see now why it was necessary for Edwards to establish that moral and natural necessity are alike (except in the things connected): that was the only way to reconcile his view of the natural universe as lawful with his view of human nature as a part of that lawful universe.

EPILOGUE: EDWARDS IN LATER AMERICAN THOUGHT

“Edwards on the Will” remained important to American psychological thought in the nineteenth century. In large part, the later response to Edwards was conditioned by the increasing influence of Scottish “common sense” philosophy in the United States.⁵⁵ Yet one could not simply reject all notions of empiricist knowledge, since the success of science in general and of Newton in particular had to be accommodated. For the realists, this was accomplished by regarding certain ideas (in particular, the ideas of cause and effect) as fundamental, on the grounds of common sense. Hume’s skepticism about causality could thus be avoided and, with it, his critique of the proofs of the existence of god.⁵⁶

Inspired primarily by Thomas Reid (1710–1796), both Nathaniel Taylor (1786–1858), a leading figure in the “New Haven” response to Unitarianism, and Thomas C. Upham (1799–1872), of Bowdoin College, argued in favor of a faculty organization of mind, in order to preserve an autonomous, freely-acting will.⁵⁷ Both Taylor and Upham took issue with Edwards’s account of causation. For Taylor, moral agents had to be regarded as the proximate cause of their own actions; hence, efficient causes could not be dispensed with.⁵⁸ Upham’s response was more complex, and reflects an interesting progression of ideas. In his 1827 *Elements of Intellectual Philosophy*, Upham did not emphasize a faculty approach to mind.⁵⁹ Although he accepted many of the aspects of Edwards’s account of the will, the definition of will given by Edwards was garbled: “The volition will always be determined by the strongest motive; in other words, the will always is, as the greatest apparent good.”⁶⁰ The

careful use of causal language that Edwards worked out is lost here, of course: Upham confused the wordings “determined by” and “is as,” thereby losing a critical aspect of Edwards’s analysis.

In later years, Upham’s account of will was modified; he adopted an explicit faculty view, categorizing the mind into the intellect, the sensibilities, and the will. The shift to a faculty point of view was apparent in his *Philosophical and Practical Treatise on the Will* published in 1834.⁶¹ This work contained a lengthy discussion of causality, one much more in accord with Edwards, and one that resulted in the conclusion that the will is subject to the operation of laws (i.e., that it is determined). At the same time, his account of the *freedom* of the will drew, in good Scottish fashion, upon the immediacy of the experience of free will: “It is impossible for me to explain what the Freedom of the Will is in words, but I know what it is in experience and in fact, and have never been destitute of that knowledge, and it is impossible that I should be destitute of it.”⁶² This leaves a contradiction, of course, to which Upham freely admits: “We find things which cannot be explained everywhere;” “Should we account it . . . strange, that, in the two distinct doctrines of the will’s freedom and the will’s subjection to law, we should find something which withstands our penetration and baffles our sagacity?”⁶³ In effect, Upham left the problem of free will unresolved.

Upham’s account of the will remained in print in America for decades and exerted a strong influence on the later content of what Kuklick characterized as the “collegiate philosophy” in America. Perhaps his irresolution succeeded in bridging the gap between those who saw Edwards as the essential touchstone of Calvinist orthodoxy and such oppositional religious and theological movements as Unitarianism.⁶⁴ Upham is a kind of symbol of the importance of the issue for America’s “indigenous psychologists.” Even as the predominant theological concerns shaped the debate, however, the underlying causal models continued to draw the attention of the most serious of the commentators, and the importance of grounding an account of mind in the most astute possible reading of science became more evident.

NOTES

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1. M. X. Lesser, *Jonathan Edwards: An Annotated Bibliography, 1979–1993* (Westport: Greenwood Press, 1994). See also, for the literature on Edwards prior to 1979, M. X. Lesser, *Jonathan Edwards: A Reference Guide* (Boston: G. K. Hall & Co., 1981).

2. Joseph A. Conforti, *Jonathan Edwards, Religious Tradition, & American Culture* (Chapel Hill: University of North Carolina Press, 1995) examines the development of Edwards as an icon of popular culture, and his continual construction and reconstruction by nineteenth and twentieth century scholars. For accounts of his impact on psychology, see James G. Blight, “Jonathan Edwards’s Theory of the Mind: Its Applications and Implications” in *Explorations in the History of Psychology in the United States*, J. Brozek, ed. (Lewisburg: Bucknell University Press, 1984), 61–120; Rand B. Evans, “The Origins of American Academic Psychology,” in *Explorations*, Brozek, ed., 17–60; and J. W. Fay, *American Psychology before William James* (New Brunswick: Rutgers University Press, 1939). A spectacular misreading of Edwards is given by A. A. Roback, *History of American Psychology* (New York: Library Publishers, 1952). For an account of the specific role of conscious experience in the reaction to Edwards, see James Hoopes, *Consciousness in New England: From Puritanism and Ideas to Psychoanalysis and Semiotic* (Baltimore: Johns Hopkins University Press, 1989). Hoopes’s study, unfortunately, regarded “psychology” and “psychoanalysis” as nearly synonymous, treating Edwards as a precursor of ideas of the unconscious.

3. Perry Miller, *Jonathan Edwards* (New York: William Sloane Associates, 1949). See also Ola Elizabeth Winslow, *Jonathan Edwards, 1703–1758: A Biography* (New York: Macmillan, 1940), which concentrated on the personal and social aspects of Edwards’s life. There is no recent “standard” biography of Edwards. Miller

(1905–1963) is generally regarded as having brought new attention to the role of Puritanism generally (and Edwards specifically) in the development of American literature and thought. See, in addition to his biography of Edwards, Miller's *The New England Mind: The Seventeenth Century* (New York: Macmillan Co., 1939) and *The New England Mind: From Colony to Province* (Cambridge: Harvard University Press, 1953). In recent years, Miller's scholarship has been heavily criticized; see, for example, George Selement, "Perry Miller: A Note on His Sources in *The New England Mind: The Seventeenth Century*," *William and Mary Quarterly* 31 (1974): 453–464. For a sampling of recent "revisionist" scholarships on Edwards, see the papers in *Jonathan Edwards and the American Experience*, Nathan O. Hatch and Harry S. Stout, eds. (New York: Oxford University Press, 1988), and, for a brief overview, Joseph Conforti's review of Hatch and Stout, "Jonathan Edwards and American Studies," *American Quarterly* 41 (1989): 165–171.

4. For a traditional account that regards the Calvinists as conservative, see Vernon L. Parrington, *The Colonial Mind, 1620–1800* (New York: Harcourt, Brace and Co., 1927). Good accounts of the theocratic basis of New England governance are Thomas Jefferson Werthenbaker, *The Puritan Oligarchy: The Founding of American Civilization* (New York: Charles Scribner's Sons, 1947) and Bruce Kuklick, *Churchmen and Philosophers: From Jonathan Edwards to John Dewey* (New Haven: Yale University Press, 1985). The enlightenment roots of the revolution itself are usefully covered by Staughton Lynd, *Intellectual Origins of American Radicalism* (New York: Pantheon Books, 1968). Jon Butler, "Coercion, Miracle, Reason: Rethinking the American Religious Experience in the Revolutionary Age" in *Religion in a Revolutionary Age*, Ronald Hoffman and Peter J. Albert, eds. (Charlottesville: University Press of Virginia, 1994), 1–30, noted that churches in all of the colonies were, in effect, tax supported, as was Edwards's church in Northampton in particular. Edwards as conservative has often been contrasted with Benjamin Franklin as liberal, his longer-lived contemporary. See, for a recent discussion, David Levin, "Edwards, Franklin, and Cotton Mather: A Meditation on Character and Reputation" in *Jonathan Edwards*, Hatch and Stout, eds., 34–49. That Edwards was "Enlightened" in any sense was denied, for example, by Oliver Wendell Holmes, "Jonathan Edwards," *International Review* 9 (1880): 1–28; Holmes regarded Edwards as "medieval," an especially interesting stance, since Holmes himself was a determinist! See Oliver Wendell Holmes, *Mechanism in Thought and Morals* (Boston: James R. Osgood, 1871). On the "warfare" between science and religion see also John C. Burnham, *How Superstition Won and Science Lost: Popularizing Science and Health in the United States* (New Brunswick: Rutgers University Press, 1987). For an unabashed defense of the "theological objectivism" of Edwards thought, see Clyde A. Holbrook, *The Ethics of Jonathan Edwards: Morality and Aesthetics* (Ann Arbor: University of Michigan Press, 1973).

5. The standard account of Puritan psychological thought prior to Edwards remains Miller's *New England Mind: The Seventeenth Century*. A good brief introduction to the context of American Calvinism prior to Edwards was given by Miller in the section introductions to *The American Puritans: Their Prose and Poetry*, Perry Miller, ed. (Garden City, Doubleday Anchor Books, 1956). See also J. Rodney Fulcher, "Puritans and the Passions: The Faculty Psychology in American Puritanism," *Journal of the History of the Behavioral Sciences* 9 (1973): 123–139; and Norman S. Fiering, "Will and Intellect in the New England Mind," *William and Mary Quarterly* 29 (1972): 515–558. On the "New Divinity" followers of Edwards, see F. H. Foster, *A Genetic History of the New England Theology* (Chicago: University of Chicago Press, 1907), as well as Miller, *Jonathan Edwards*, and Kuklick, *Churchmen and Philosophers*.

6. Kuklick, *Churchmen and Philosophers*. The term "Arminian" derives from the Dutch theologian Jacobus Arminius (1560–1609), who rejected the Calvinist doctrine of predestination, arguing instead for free will as a manifestation of god's pity for fallen humans. His views were declared heretical by a Calvinist Synod in 1618. See R. L. Colie, "Arminius and Arminianism" in *Encyclopedia of Philosophy*, Paul Edwards, ed. (New York: Macmillan, 1967), 164–165. No one in New England explicitly allied him or herself with Arminius: Edwards's use of the term was pejorative. See also Conrad Wright, *The Beginnings of Unitarianism in America* (Boston: Starr King Press, 1955).

7. Jonathan Edwards, *A Careful and Strict Enquiry into the Modern Prevailing Notions of That Freedom of Will, Which is Supposed to be Essential to Moral Agency, Virtue and Vice, Reward and Punishment, Praise and Blame* (Boston: S. Kneeland, 1754). The best modern edition is *Jonathan Edwards: Freedom of the Will*, Paul Ramsey, ed., vol. 1, *Works of Jonathan Edwards* (New Haven: Yale University Press, 1957). The most extensive recent study of Edwards's work on the will focused upon his theological agenda: Allen C. Guelzo, *Edwards on the Will: A Century of American Theological Debate* (Middletown: Wesleyan University Press, 1989).

8. In Jonathan Edwards, *Original Sin*, Clyde A. Holbrook, ed., vol. 3, *Works of Jonathan Edwards* (New Haven: Yale University Press, 1970).

9. Blight, "Jonathan Edwards," has the best account of the psychological model that underlies Edwards's descriptions in the *Religious Affections* and the *Original Sin*. Oddly, Blight said relatively little about the *Enquiry*, focusing instead upon Edwards's account of experience, particularly the experience of religious conversion.

10. Miller, *Jonathan Edwards*; Foster, *Genetic History of the New England Theology*; I. Woodbridge Riley, *American Philosophy: The Early Schools* (New York: Dodd, Mead & Co., 1907); Alexander Campbell Fraser, "Appendix C. Samuel Johnson and Jonathan Edwards" in *The Works of George Berkeley, D. D.; Formerly Bishop of Cloyne, Including his Posthumous Works*, A. C. Fraser, ed., vol. 3, (Oxford: at the Clarendon Press, 1901), 390–398.

11. Norman Fiering, *Jonathan Edwards's Moral Thought and its British Context* (Chapel Hill: University of North Carolina Press, 1981). In particular, Fiering argued that the influence of Malebranche on Edwards has been ne-

- glected by scholars. He claimed that even the specific wordings used by Edwards are based on Malebranche, a point that has been obscured since most scholars have used the relatively common Thomas Taylor translation of the major work, *Father Malebranche's Treatise Concerning the Search After Truth* . . . T. Taylor, trans., (London: by L. Lichfield, for Thomas Bennet, 1694), rather than the quite scarce translation by Richard Sault that appeared in the same year and (according to Fiering) may have been available to Edwards: *Malebranche's Search after Truth. Or, A Treatise of the Nature of the Humane Mind, and of its Management for Avoiding Error in the Sciences* . . . Done out of French. . . , Richard Sault, trans., (vol. 1, London: for F. Dunton, 1694; vol. 2, London: for S. Manship, 1695). See also the Appendix, "Malebranche in Colonial America" in Charles J. McCracken, *Malebranche and British Philosophy* (Oxford: Oxford University Press, 1983), 329–340.
12. Alice M. Baldwin, *The New England Clergy and the American Revolution* (Durham: Duke University Press, 1928).
13. See especially Jonathan Edwards, *Scientific and Philosophical Writings*, Wallace Anderson, ed., vol. 6, *Works of Jonathan Edwards* (New Haven: Yale University Press, 1980).
14. Isaac Newton, *Mathematical Principles of Natural Philosophy*, Andrew Motte, trans., Florian Cajori, ed. (Berkeley: University of California Press, 1934). Originally published in 1687 in Latin; this translation first published in 1729. This edition also reprints the important preface to the 1713 second edition by Roger Cotes. A useful brief summary of the argument is given by Dudley Shapere, "Newtonian Mechanics and Mechanical Explanation" in *Encyclopedia of Philosophy*, Paul Edwards, ed., vol. 5 (New York: Macmillan Publishing Co., 1967), 491–496. The standard biography is Richard S. Westfall, *Never at Rest: A Biography of Isaac Newton* (Cambridge: Cambridge University Press, 1980). A classic account of Newton's influence on American political thought is Arthur O. Lovejoy, *Reflections on Human Nature* (Baltimore: Johns Hopkins University Press, 1961). For a recent review of this conception, see Richard Striner, "Political Newtonianism: The Cosmic Model of Politics in Europe and America." *William and Mary Quarterly* 52 (1995): 583–608.
15. On Puritan conceptions of science see Perry Miller, *The New England Mind*, especially Chapter 26. Some have expressed a need for caution in evaluating the role of science in colonial times in America. In particular, regional differences have been overlooked by scholars. See Ronald L. Numbers, "Science and Religion" in *Historical Writing on American Science*, Sally Gregory Kohlstedt and Margaret W. Rossiter, eds. (Philadelphia: History of Science Society, 1985), 59–80.
16. Michael P. Winship, "Prodigies, Puritanism, and the Perils of Natural Philosophy: The Example of Cotton Mather," *William and Mary Quarterly* 51 (1994): 92. Note also that Burnham, *How Superstition Won*, has argued that superstitious beliefs (like those associated with Mather's cabbage) remained characteristic of American popular culture in both the nineteenth and twentieth centuries.
17. Cadwallader Colden, *An Explication of the First Causes of Action in Matter; and of the Cause of Gravitation* (London: for J. Brindley, 1746; first published New York: by James Parker, 1745). Colden argued that matter does have an active nature and could serve as its own first cause. For a sample account of earthquakes, part of the great "Earthquake Debate" that followed a severe quake in the Boston area in 1727, see Thomas Prince, *Earthquakes the Works of God and Tokens of Just Displeasure*, . . . [Sermon] at the Particular Fast in Boston, Nov. 2 and the General Thanksgiving, Nov. 9 . . . , second edition, corrected (Boston, for D. Henchman, 1727). Droughts and rainfall were the subject of Prince's *The Natural and Moral Agency of God in Causing Droughts and Rains. A Sermon* . . . in Boston, . . . (Boston: Kneeland and Green's, 1749). Interestingly, according to Mark Valeri, "The Economic Thought of Jonathan Edwards," *Church History* 60 (1991): 37–54, Edwards also delivered a sermon (which has not been published) on the earthquake of 1727, attributing it in part to god's displeasure over economic vices. Edwards, as Valeri notes, was in general unsympathetic to the materialistic capitalism of his day.
18. This aspect of the approach was first explicitly drawn out by Roger Cotes, in a separate preface to the 1713 second edition. Cotes's preface is in the Cajori edition cited above, xx–xxxiii.
19. On the difference between Newtonian and Cartesian physics, see Charles Coulton Gillespie, *The Edge of Objectivity: An Essay in the History of Scientific Ideas* (Princeton: Princeton University Press, 1960). Edwards probably knew Samuel Clarke's translation of Jacques Rohault, *Rohault's System of Natural Philosophy, Illustrated with Dr. Samuel Clarke's Notes Taken Mostly out of Sir Isaac Newton's Philosophy, with Additions*, Samuel Clarke, trans. (London: for James Knapton, 1723). Rohault was a Cartesian, but Clarke's very extensive notes effectively presented the Newtonian alternative. See L. L. Laudan, "Introduction," in the reprint of Clarke's edition of Rohault (New York: Johnson Reprint Corp., 1969).
20. Newton, *Principia*, Book III: General Scholium, 547. In the *Opticks, or, A Treatise of the Reflections, Refractions, Inflections & Colours of Light*, fourth edition (London: for William Innys, 1730; repr. New York: McGraw–Hill Book Co., 1931), Newton entertained some speculations on this matter, which bedeviled physics until the emergence of field theory in the nineteenth century. See L. Pearce Williams, *The Origins of Field Theory* (New York: Random House, 1966) for a good introduction to the issues, and, for analyses of the emergence of field theory, Mary B. Hesse, *Forces and Fields: The Concept of Action at a Distance in the History of Physics* (London: Thomas Nelson and Sons, 1961) and Nancy J. Nersessian, *Faraday to Einstein: Constructing Meaning in Scientific Theories* (Dordrecht: Martinus Nijhoff, 1984).
21. Newton, *Principia*, Book II: Scholium, 396.
22. *The Leibniz-Clarke Correspondence, Together with Extracts from Newton's Principia and Opticks*, H. G.

Alexander, ed. (Manchester: Manchester University Press, 1956). Alexander's "Introduction," pp. ix–lvi, contains an excellent account of the controversy. Fiering, *Jonathan Edwards's Moral Thought*, 295, stated that Edwards never read this exchange of letters, but did not indicate why he makes this claim. On the face of it, Fiering's claim seems unlikely, since the correspondence was published long before Edwards wrote the *Enquiry*; Samuel Clarke, *A Collection of Papers Which Passed Between the Late Learned Mr. Leibniz and Dr. Clarke . . .* (London: for James Knapton, 1717). Ramsey, "Editor's Introduction," *Freedom*, 114, noted that the Leibniz–Clarke Correspondence was not listed in Edwards's personal catalogue of works read, although it was widely available in New England at the time.

23. Newton, "Advertisement II," [1717], in *Opticks*, xix. See also his comment, written in 1693 to Richard Bentley, "You sometimes speak of Gravity as essential and inherent to Matter. Pray do not ascribe that Notion to me; for the Cause of Gravity is what I do not pretend to know," in *Isaac Newton's Papers & Letters on Natural Philosophy*, I. Bernard Cohen, ed. (Cambridge: The Harvard University Press, 1958): 298. Perry Miller provided an interesting account of Bentley and Newton in his section introduction to the Bentley correspondence in this volume, 271–278. See also 110 in Wallace Anderson's "Introduction" to the Yale edition of Edwards's *Scientific and Philosophical Writings*.

24. Newton, *Opticks*, 401.

25. A good account of the changes in meaning of the term "mechanistic" is found in G. N. Cantor and M. J. S. Hodge, "Introduction: Major Themes in the Development of Ether Theories from the Ancients to 1900" in *Conceptions of Ether: Studies in the History of Ether Theories, 1740–1900*, G. N. Cantor and M. J. S. Hodge, eds. (Cambridge: Cambridge University Press, 1981), 1–60. See especially 15–24. Note also that, according to Cantor and Hodge (p. 48), the term "mechanical" changed meaning; by the nineteenth century it was being used to describe any Newtonian system that relied upon Newton's laws of motion. In the present paper, I use the term consistently only in its earlier sense.

26. Otto Mayr, "A Mechanical Symbol for an Authoritarian World" in *The Clockwork Universe: German Clocks and Automata, 1550–1650*, Klaus Maurice and Otto Mayr, eds. (New York: Neale Watson Academic Publications, 1980), 1–9. See also Robert H. Hurlbutt III, *Hume, Newton, and the Design Argument*, rev. ed. (Lincoln: University of Nebraska Press, 1985).

27. Leibniz, "Mr. Leibniz's First Paper, being an Extract of a Letter Written in November, 1715" in *Leibniz-Clarke Correspondence*, Alexander, Ed., 11.

28. See John W. Yolton, *Thinking Matter: Materialism in Eighteenth-Century Britain* (Minneapolis: University of Minnesota Press, 1983).

29. Edwards was not the only one to see that Newton's determinism was not mechanistic. In fact, Samuel Clarke held a similar view, although to very different ends. For him, the point was to defend the freedom of an autonomous will; see Clarke's *A Discourse Concerning the Being and Attributes of God, the Obligations of Natural Religion, and the Truth and Certainty of the Christian Revelations*, fifth edition (London: for James Knapton, 1719).

30. Newton and Locke even in modern times are often paired as exemplars of "The Enlightenment;" see Gerd Buchdal, *The Image of Newton and Locke in the Age of Reason* (London: Sheed and Ward, 1961). Locke's scientific education and his relation to the founders of the Royal Society was described by Kenneth Dewhurst, *John Locke (1632–1704), Physician and Philosopher: A Medical Biography, With an Edition of the Medical Notes in His Journals* (London: Wellcome Historical Medical Library, 1963). Catherine Wilson, *The Invisible World: Early Modern Philosophy and the Invention of the Microscope* (Princeton: Princeton University Press, 1995), has argued that Locke's epistemology was actually conservative, and that he objected to the use of "invisible mechanisms" to account for phenomena, preferring instead, like Newton, to rely on the lawful correlation of visible phenomena. Leibniz, by contrast, was extremely interested in such "invisible worlds," as attested by his monadology and by his use of infinitesimals in the development of the calculus. Some of the psychological implications of Leibniz's infinitesimals and the very different Newtonian "fluxions" are discussed in Elke M. Kurz and Ryan D. Tweney, "The Practice of Mathematics and Science: From Calculus to the Clothesline Problem" in *Rational Models of Cognition: Essays on John Anderson's Account of Adaptive Cognition*, Michael Oaksford and Nicholas Chater, eds. (Oxford: Oxford University Press, in press). See also Elke M. Kurz, "Representational Practices of Differential Calculus," (Ph.D. diss., Bowling Green State University, 1997).

31. Gottfried Wilhelm Leibniz, *New Essays Concerning Human Understanding . . .*, Alfred Gideon Langley, trans. (New York: Macmillan, 1896). David E. Leary provided a good brief summary of Leibniz's psychological views in "The Historical Foundation of Herbart's Mathematization of Psychology," *Journal of the History of the Behavioral Sciences* 16 (1980): 150–163.

32. See Steven Shapin and Simon Schaffer, *Leviathan and the Air-Pump: Hobbes, Boyle, and the Experimental Life* (Princeton: Princeton University Press, 1985) for an account of the emergence of experimentation as a social means of persuasion, and Geoffrey Cantor, "The Rhetoric of Experiment" in *The Uses of Experiment: Studies in the Natural Sciences*, David Gooding, Trevor Pinch, and Simon Shaffer, eds. (Cambridge: Cambridge University Press, 1989), 159–180.

33. John Wilkins, *Ecclesiastes, or, A Discourse Concerning the Gift of Preaching As It Falls Under the Rules of*

- Art, third edition (London, by T. R. and E. M. for Samuel Gellibrand, 1651). The passage was quoted by Wilbur S. Howell, *Eighteenth-Century British Logic and Rhetoric* (Princeton: Princeton University Press, 1971), 456.
34. For Locke's account of language, see Howell, *Eighteenth-Century British Logic*, 489–502, and Hans Aarsleff, *From Locke to Saussure: Essays on the Study of Language and Intellectual History* (Minneapolis: University of Minnesota Press, 1982). Barbara M. Stafford, *Artful Science: Enlightenment Entertainment and the Eclipse of Visual Education* (Cambridge: MIT Press, 1994) has argued that the Enlightenment produced a reaction against the “deceptiveness” of visual imagery and a search for new ways to establish the verifiability of truth claims, a process that privileged text over the visual. By extension, plain text would be similarly privileged over “rhetorical flourishes.” In an earlier book, *Body Criticism: Imaging the Unseen in Enlightenment Art and Medicine* (Cambridge: MIT Press, 1991), Stafford dealt extensively (and critically) with Locke's theory of abstraction.
35. John Locke, *An Essay Concerning Human Understanding*, P. H. Nidditch, ed. (Oxford: Clarendon Press, 1975.) bk. II, ch. 21: 242. The *Essay* was first published in 1690. Nidditch reprinted the fourth edition of 1700, with indications of the differences among earlier editions. Edwards evidently based his argument on the will on a reading of Locke's first, 1690, edition, though he clearly had the later edition available to him; the issue is important because Locke made critical revisions to his account of the will after the first edition, revisions which Edwards did not take fully into account. See Paul Ramsey, “Editor's Introduction” to Edwards, *Freedom*, especially 53–54.
36. P. 138, quoting Locke, bk. II, ch. 21, §17: 242. See also Edwards, *Freedom*, Ramsey, ed.: 163–165. Locke's argument that it makes no sense to speak of the freedom of the will is detailed in Ch. 21 of bk. II: 233–287.
37. Bk II, ch. 21, §18: 242.
38. Bk II, ch. 21, §19: 243.
39. Jon Pahl, *Paradox Lost: Free Will and Political Liberty in American Culture, 1630–1760* (Baltimore: Johns Hopkins University Press, 1992), 151, Fiering, *Jonathan Edwards's Moral Thought*, 343, and Guelzo, *Edwards on the Will*, 29–30, also denied that Edwards was a Newtonian, but noted only Edwards's reaction to atomism, which did differ from Newton's. As I have argued, some recent commentators have misunderstood the nature of Edwards's determinism. Thus, for example, Merle Curti, *Human Nature in American Thought* (Madison: University of Wisconsin Press, 1980) regarded Edwards as *defending* the freedom of the *faculty* of will! A more careful account, and one which includes an astute criticism of the philosophical adequacy of Edwards's account of will, is that by Morton White, *Science & Sentiment in America: Philosophical Thought from Jonathan Edwards to John Dewey* (London: Oxford University Press, 1972). Much of the misunderstanding can seem almost willful, particularly when an overriding theological concern is present (as has often been the case, even very recently).
40. *Paradox Lost*, 216, n. 39.
41. Edwards, *Freedom*, Ramsey, ed., 141.
42. *Ibid.*, 138.
43. Edwards, *Enquiry*, 8, emphasis in the first edition of the *Enquiry*, but not the 1957 edition. I have modernized Edwards's spelling in this quote, but have retained the capitalization and emphasis, because I believe their absence (as in the modern edition edited by Ramsey) alters the force of this important passage.
44. Edwards, *Freedom*, Ramsey, ed., 141.
45. Blight “Jonathan Edwards's Theory of the Mind,” 1984, noted that this places Edwards close to recent cognitive accounts of human nature; some earlier commentators saw a parallel with behaviorism, for example, Joseph Haroutunian, *Piety Versus Moralism: The Passing of the New England Theology* (New York: Henry Holt and Co., 1932). On the need for understanding the microstructure of cognition, see my “A Framework for the Cognitive Psychology of Science,” in *Psychology of Science: Contributions to Metascience*, Barry Gholson, et al., eds. (Cambridge: Cambridge University Press, 1989): 342–366. On the need for dynamic approaches to cognition and action, see the papers in *Mind as Motion: Explorations in the Dynamics of Cognition*, Robert F. Port and Timothy Van Gelder, eds. (Cambridge: MIT Press, 1995).
46. Edwards, *Freedom*, Ramsey, ed., 180.
47. Guelzo, *Edwards on the Will*, 49. Ramsey has noted, in his “Introduction” to the *Enquiry*, 34–35, that Edwards's notion of causation resembled Hume's, although without Hume's further commitment to the uncertainty of knowledge of causation. See also Blight, “Edward's Theory of the Mind.”
48. The example of the drunkard was used in *Freedom*, 143; Locke used the example also, (as was noted by Edwards just before his own description of the drunkard example) but to very different purpose. For Locke “uneasiness” precedes an act of the will (see *Essay*, 252–253), a position that Edwards rejected, since his account required no antecedent emotional state, given that the will “is as” the apparent good. Note also that this is a further example where Edwards explicitly rejected a mechanistic account.
49. Isaac Watts, *Essay on the Freedom of the Will in God and in Creatures, and on Various Subjects Connected Therewith*. In *The Works of the Reverend and Learned Isaac Watts, D.D.: Containing, Besides his Sermons, and Essays on Miscellaneous Subjects, Several Additional Pieces*, George Burder, David Jennings, and Phillip Doddridge, comps., vol. 6 (London: J. Barfield, 1810): 239–280 (First published 1734). Edwards dealt with Watts primarily in Part IV, Section 7 and 8 of *Freedom*, Ramsey, ed., 375–396.
50. Quoted by Edwards, *Freedom*, Ramsey, ed., 385. Wallace Anderson, in discussing Edwards's reply to Watts,

misread this passage; see Edwards, *Scientific and Philosophical Writings*, Anderson, ed., 87–89. Edwards did use a principle like Leibniz's principle of sufficient reason. But doing this is not the same as accepting Leibniz's point on the identity of indiscernibles! Ramsey, "Editors Introduction," in Edwards, *Freedom*: 113–115 has a more careful treatment of the issue.

51. Edwards, *Freedom*, Ramsey, ed., 392. Note that Edwards here appeared to accept Newton's concept of absolute space.

52. *Ibid.*, 393.

53. Norman Fiering regarded Perry Miller's attribution of Edwards's ideas to Newton (in Miller, *Jonathan Edwards*, 71–99) as "ahistorical," and would presumably regard the argument of the present paper in a similar light. Perry Miller can be criticized for the specifics of his reading of Edwards's physical ideas, though not for suggesting that they were Newtonian in character. As noted, however, Fiering neglected the overwhelming differences between Cartesian physics and Newton's. It is known that Edwards read Newton (and Locke) while at Yale, between 1719 and 1722; many of his unpublished scientific notes dealt with Newtonian physics. See Anderson "Editor's Introduction" in Edwards, *Scientific and Philosophical Writings*, Anderson, Ed. See also Max Jammer, *Concepts of Force: A Study of the Foundations of Dynamics* (New York: Harper Torchbooks, 1962), for the theological bearing of More's, Clarke's, and Newton's concepts of force.

54. The quote is from Edwards, "The Mind," unpublished notebook, in Edwards, *Scientific and Philosophical Writing*, Anderson, ed., 380. There is uncertainty about the dating of this manuscript. As Anderson noted, it has long been regarded as an early work, perhaps dating from Edwards's college days (c. 1718). Anderson convincingly argued, however, that it dates from a much later time, parts of it perhaps not long before the composition of the *Enquiry*. See Anderson, 313–331. The issue is especially important for the frequent view that Edwards anticipated Berkeley even as a youth, a claim that is now suspect. As noted above, the claim that Edwards was a *Berkeleyan* idealist has been the subject of much debate. See Leon Howard, "*The Mind*" of Jonathan Edwards: A Reconstructed Text (Berkeley: University of California Press, 1963); Edwin S. Gaustad, *George Berkeley in America* (New Haven: Yale University Press, 1979); and Hoopes, *Consciousness in New England*, especially 75–81.

55. See Fay, *American Psychology*. Space does not permit an account of the earliest (non-Scottish!) controversy over Edwards. See especially [James Dana], *An Examination of the Late Reverend President Edwards's Enquiry on Freedom of Will; More Especially the Foundation Principle of his Book, with the Tendency and Consequences of the Reasoning Therein Contained, . . . With an Appendix, Containing a Specimen of the Coincidence Between the Principles of Mr. Edwards's Book, and Those of Ancient and Modern Fatalists* (Boston: Daniel Kneeland, 1770). Dana saw Edwards's *Enquiry* as an extremely threatening work; see Allen C. Guelzo, "From Calvinist Metaphysics to Republican Theory: Jonathan Edwards and James Dana on Freedom of the Will," *Journal of the History of Ideas*, 56 (1995): 399–418. Guelzo's article demonstrates the complexity of assigning either Edwards, his successors, or his opponents to "conservative" or "liberal" categories.

56. A good account of the scientific response to Hume is given by Richard Olson, *Scottish Philosophy and British Physics, 1750–1880: A Study in the Foundations of the Victorian Scientific Style* (Princeton: Princeton University Press, 1975). For the American context, see Rand Evans, "Origins."

57. Reid was also heavily influenced by Newton; see Ryan D. Tweney, "Isaac Newton's Two Uses of Hypothetical Reasoning," *Storia e critica della Psicologia* 1 (1980): 235–249. For Taylor and Upham, see Foster, *Genetic History*; Kuklick, *Churchmen and Philosophers*; and Evans, "Origins."

58. Guelzo, *Edwards on the Will*, 245–246, notes that Taylor did try to offer an alternative conception, replacing Edwards's "moral necessity" with "moral certainty," thus allowing more scope for free choice within what we might today regard as a conception of "probabilistic law." Such conceptions played an important part in later American thought; see Elke Kurz and Ryan D. Tweney, "The Heretical Psychology of Egon Brunswik" in *A Pictorial History of Psychology*, Wolfgang G. Bringmann, H. E. Leuck, R. Miller, and C. E. Early, eds. (Carol Stream: Quintessence Publishing Co., 1997), 221–232.

59. Thomas C. Upham, *Elements of Intellectual Philosophy: Designed as a Text-book* (Portland, Maine: William Hyde, 1827).

60. Upham, *Elements*, 401.

61. Thomas C. Upham, *A Philosophical and Practical Treatise on the Will* (Portland, Maine: William Hyde, 1834). Later, he added, as the third volume of his *Elements*, a slightly revised version of this book: *A Philosophical and Practical Treatise on the Will. Forming the Third Volume of a System of Mental Philosophy* (New York: Harper & Brothers, 1841). See also Todd L. Adams, "Agency Theory: The Dilemma of Thomas C. Upham," *Transactions of the Charles S. Peirce Society* 28 (1992): 547–568.

62. Upham, *Treatise on the Will*, 244.

63. Upham, *Treatise on the Will*, 279–280.

64. Kuklick, *Churchmen and Philosophers*; Haroutunian, *Piety Versus Moralism*; Hoopes, *Consciousness in New England*.