DETERMINISM, CHANCE, AND FREEDOM

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Introduction

In the mid-1950s the Regius Professor of Divinity at Oxford, Leonard Hodgson, gave the Gifford Lectures in the University of Glasgow. They were entitled *For Faith and Freedom*, and in them Hodgson pointed out that people routinely notice three kinds of events.[1] Some events are determined, as when a tree limb that breaks falls from the tree. Others are random, as when a tornado destroys one house while leaving its neighbors untouched.[2] Still others are freely chosen, as when a student decides to skip class and play golf. Let us call these determined, chance, and free events.

Some philosophers, theologians, and scientists have adopted the view that only one of these kinds of events is what it seems to be. Determinism is one such view. It is the claim that all events, not just some, are determined. Hard determinism is the view that, since all events are determined, no chance or free events occur; soft determinism is the view that, although all events are determined, some determined events have an additional aspect of chance or freedom.[3] Determinism received a boost from early modern science because scientists like Isaac Newton thought that the world is causally determined.[4]

Albert Einstein and Determinism

Albert Einstein's theories about relativity subverted Newton's view that space and time are absolute, but they did not subvert his view that events in the world are causally determined.

Quantum mechanics did. Einstein helped launch quantum mechanics by an address he gave in 1909 in which he argued that the wave and particle theories of light are both descriptions of reality: "I thus believe that the next phase of theoretical physics will bring us a theory of light that can be interpreted as a kind of fusion of the wave and of the emission theories of light."[5] He admitted it was puzzling: "Is it possible to combine energy quanta and the wave principles of radiation? Appearances

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[1] Leonard Hodgson, *For Faith and Freedom* (Oxford: Basil Blackwell, 1956), I:136-145.

[2] On windless days limbs that break always fall; they never fly away into the sky. Tornados sometimes destroy one house without touching others, and sometimes destroy all the houses in an area, apparently at random.

[3] For a discussion of dual-aspect monism see John Polkinghorne, *Science and Theology* (Minneapolis: Fortress Press, 1998), 54-55. William James named these two versions of determinism "hard" and "soft," but both versions were known before James; see Richard Taylor, "Determinism,"in *Dictionary of Philosophy,* ed. Paul Edwards (New York: Macmillan Publishing Co., Inc. & The Free Press, 1967), I:368.

[4] Apparently Newton thought that his extensive writings about the Bible were more important than his writings about optics and gravity, an estimate not widely shared today.

[5] Walter Isaacson, *Einstein: His Life and Universe* (New York: Simon & Schuster, 2007), 156.

are against it, but the Almighty–it seems–managed the trick."[6]

But in the 1920s Niels Bohr, Werner Heisenberg, and others began to develop quantum theory in ways that Einstein could not accept. They spoke of the behavior of photons as random; they insisted that it is impossible to know both the position and momentum of certain sub-atomic particles; and, strangest of all, they said that the behavior of one particle could effect instantaneously the behavior of another at a distance without any causal relationship between them or any information being transferred between them. The sub-atomic world they described is one of chance rather than determinism and one known in terms of probabilities rather than certainties.

Einstein said that if there is randomness in nature, "it means the end of all physics,"[7] and he was unconvinced of what he later called "spooky action at a distance."[8] Initially he rejected indeterminism outright, but as quantum theory was confirmed by experiments and became increasingly established among theoretical physicists, he conceded that it was true but insisted that it was an incomplete account: "I am convinced that this theory undoubtably contains a part of the ultimate truth."[9] He spent his last years searching for "a unified field theory that would subsume [quantum mechanics] into a more deterministic framework."[10] In 1926 he wrote of quantum mechanics, "The theory says a lot, but it does not really bring us any closer to the secrets of the Old One. I, at any rate, am convinced that He does not play dice."[11] When he repeated the remark about dice at a conference the following year, his friend Max Born responded that human beings should not tell God how to run the world.[12]

Consistent with his rejection of randomness in nature, Einstein affirmed hard determinism: "I am a determinist. Everything is determined . . . by forces over which we have no control. It is determined for the insect as well as for the star. Human beings, vegetables, or cosmic dust, we all dance to a mysterious tune, intoned in the distance by an invisible player."[13] However, "I am compelled to act as if free will existed because if I wish to live in a civilized society I must act responsibly. I know that philosophically a murderer is not responsible for his crime, but I prefer not to take tea with him."[14]

Born wrote to Einstein, "I cannot understand how you can combine an entirely mechanistic universe with the freedom of the ethical individual."[15] Just as Einstein had thought that indeterminism

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[6] Ibid., 157.

[7] Ibid., 325.

[8] Ibid., 450.

[9] Ibid., 349.

[10] Ibid., 316.

[11] Ibid., 335.

[12] Ibid., 326; see also 609, n. 45.

[13] Ibid., 391-92.

[14] Ibid., 392-93.

[15] Ibid., 392.

would mean the end of physics, so Born thought that determinism would mean the end of ethics. He had a point; it is not clear how human beings can be responsible moral agents if they have no freedom.

John Calvin and Determinism

The debate about determinism is not a debate between science and theology, for there is a long and respected tradition in Christian theology which embraces a deterministic view of the universe. The theologians' determinism differs from that of Einstein, however, in that he saw the world as determined by the laws of nature; the theologians rejected that idea and called it *fate*. Their version of determinism is that the world is determined by the will of God; this is theological rather than physical determinism.

One of the most biblical and traditional of these theologians was John Calvin. He was not a fatalist: "We do not, with the Stoics, contrive a necessity out of the perpetual connection and intimately related series of causes, which is contained in nature; but we make God the ruler and governor of all things."[16] Calvin believed that "all events are governed by God's secret plan,"[17] that "whatever happens in the universe is governed by God,"[18] and that "nothing takes place without his deliberation."[19] In fact, "not one drop of rain falls without God's sure command."[20] He found it comforting that, "when the world appears to be aimlessly tumbled about, the Lord is everywhere at work."[21] God "directs everything by his incomprehensible wisdom."[22]

Consequently, "nothing takes place by chance."[23] But what about freedom? Calvin believed that before human beings committed sin, they were free, but when they sinned, they forfeited their freedom. But even in their sinning, they were in a sense doing God's will: "God wills to take place what he forbids to be done."[24]

Calvin thought of God as commanding events rather than permitting them: "They babble and talk absurdly who, in place of God's providence, substitute bare permission,"[25] and "It would be ridiculous for the Judge only to permit what he wills to be done, and not also to decree it and to command its

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[16] John Calvin, *Institutes of the Christian Religion*, trans. Ford Lewis Battles. The Library of Christian Classics, XX-XXI (Philadelphia: The Westminster Press, 1960), I.XVI.8.

[17] Ibid., I.XVI.2.

[18] Ibid., I.XVII.2.

[19] Ibid., I.XVI.3.

[20] Ibid., I.XVI.5.

[21] Ibid., I.XVII.11.

[22] Ibid., I.XVI.4.

[23] Ibid.

[24] Ibid., I.XVIII.3.

[25] Ibid., I.XVIII.1.

execution."[26] In short, "God does not permit but governs by his power."[27]

We have seen that Einstein thought there is an overarching determinism which subsumes the random behavior of the quanta; in a similar manner Calvin thought that God's overarching governance of every event that occurs in the universe subsumes the free choices of human beings. However, unlike Einstein, Calvin believed that determinism is compatible with human moral responsibility. The words "compatibilism" and "congruism" are used to affirm the claim that God's governance of all things is compatible with human beings being responsible for their moral actions.[28]

Leonard Hodgson and Determinism

Not all theologians are determinists. For example, Leonard Hodgson argued that all three kinds of events–determined, chance, and free–are just what they seem to be, and he called attention to a situation in which all three occur. Before a ball game, in order to decide which team will begin on the offensive, we flip a coin. We do this freely, for a purpose; in doing it, we create a situation in which there is chance; and, once the coin is released, it will turn and land according to causally determined laws of physics. "It has long seemed to me that this familiar experience has not been given by philosophers the attention it deserves," Hodgson wrote.[29]

If Hodgson was correct, then some events in the world are determined and others are not. Hodgson acknowledged that sometimes we mistake one for the other, thinking, for example, that we have acted freely when in fact our act was determined by some impulse of which we were unaware, or assuming that an event was purposed by God when, in fact, it was a chance occurrence. In an age which prizes a hermeneutics of suspicion, many mistakes of this kind are uncovered, but Hodgson insisted that we must not assume that, just because we sometimes are mistaken, we always are.[30]

Dualism and Determinism

What model can be used to display how all three kinds of events can occur in a single world? One which holds together determinism and freedom is dualism, the claim that human beings are both physical beings (who are determined) and spiritual beings (who are free). The most famous advocate

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[26] Ibid.

[27] Ibid., III.23.1.

[28] Millard Erickson, *Systematic Theology* (Grand Rapids: Baker Book House, 1983, 1984, 1985), 357, 359. This is soft rather than hard determinism.

[29] Hodgson, I:142. The purpose of flipping the coin was to create unpredictability (and so fairness). Ontologically, chance events are random; it is their randomness, and not just the limitations in our knowledge, that renders them epistemologically unpredictable. See M. J. Langford, "Determinism" in *Westminster Dictionary of Theology*, ed. John Bowden and Alan Richardson (Philadelphia: Westminster John Knox, 1983), 154.

[30] If the three are what they seem to be, then none should be thought of as a variant of either of the others. This may contribute to the famous difficulty in describing chance and freedom. Less noticed is the difficulty of describing causality; David Hume argued that we never observe causality, only constant succession; see Taylor, 366.

of dualism in the modern world was the philosopher René Descartes. Many religious people hold some version of dualism.

Dualism is an issue in contemporary discussions of brain and mind. The human brain is a physical organ which at maturity weighs about three pounds and whose electrical and chemical activities and structure are studied by neuroscientists. Is there also a mind which is not the brain, a "ghost in the machine" which is inaccessible to the neuroscientists?

Emergence and Determinism

Many people, some for scientific and some for religious reasons, think it is unwise to posit, in addition to the brain, a "mental" or "spiritual" substance or soul which is inaccessible to science. But if there is no spiritual substance, how can free events occur?

Hodgson felt that the evolutionary account of the universe provides a clue:

> When as a boy I first began to take an interest in the views of scientists, they seemed to describe the universe as a vast container within which material objects were moving about exchanging shares in a constant total supply of energy. Now the container has disappeared, and so has the ultimate distinction between the material objects and the energy. Fundamentally the universe appears to be a stream of energy flowing through space-time and getting itself differentiated into organisms of varying complexity.[31]

When we replace the closed-container model with the flowing-energy model, we encounter the fact of emergence.[32] The varying subject matter of the scientific disciplines displays emergence. For our purposes we will speak of three of these: physics, biology, and psychology.[33]

Physicists study the atom, sub-atomic particles, and the mathematically describable laws by which these operate. The particles and laws are not alive, and they are not conscious. Einstein thought that everything about their behavior is determined; Niels Bohr did not.

Biologists study cells. Cells are composed entirely of atoms which have bonded into chemical compounds; nothing extra is added to them from the outside. Nevertheless, once the chemical compounds assemble to form biological cells, things are true about them which were not true of the compounds or atoms beforehand. For example, biological cells have life, they reproduce themselves, and so on; in addition, new laws emerge which govern the behavior of living cells. In other words, as the chemical compounds bond into biological cells, new properties emerge.

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[31] Hodgson, I:125-26.

[32] See Harold J. Morowitz, *The Emergence of Everything* (Oxford: Oxford University Press, 2002); see also T. A. Goudge, "Emergent Evolutionism" in *Dictionary of Philosophy*, I:474-77.

[33] Nancey Murphy, *Reconciling Theology and Science* (Kitchener, Ontario: Pandora Press, 1997), 12-18.

Psychologists study human beings. Human beings are composed entirely of biological cells; nothing extra is added to them from the outside. Nevertheless, once the cells assemble to form human beings, things are true about them which were not true about the cells beforehand. They have consciousness, knowledge of right and wrong, freedom to make decisions, responsibility for their moral choices, and so on; in addition, new laws emerge which govern the behavior of human beings. In other words, as the cells assemble into human beings, new properties emerge.[34]

Emergence is a promising account of the sometimes mysterious relationships between determined, chance, and free events. On this model, determination, chance, and freedom are not different aspects of the same event, as soft determinists and compatibilists argue. They are rather three distinct properties which have emerged as atoms bonded together into increasingly complex entities.

Because emergence is itself mysterious,[35] it cannot provide a mystery-free explanation of the coming-to-be of new properties. But it is a gain in understanding to realize that properties which do not exist in the regimes studied by physicists and chemists really do emerge in the regimes studied by biologists and psychologists, and that this fact is recognized not only by non-scientists who are seeking to affirm the dignity of human beings but also by scientists. Emergence is a model which can accommodate what ordinary people think they observe in our world, namely, that determined, chance, and free events all occur.

This also gives us insight into the biblical teaching that God is the Creator of the world: a personal Being freely and purposefully creates a world of a certain kind, namely, one that includes a great deal of orderliness by means of causal determination, but one that also includes chance and human freedom. Just as human beings, in order to carry out their purposes, introduce chance by flipping a coin, so God, in order to carry out divine purposes, introduces chance and freedom into the universe.

Conclusion

The mystery of determined, chance, and free events has been debated repeatedly since it was first addressed in the ancient world, and it is likely that it will remain an essentially contested concept[36] for the indefinite future. Perhaps you will find, as I have, emergence a satisfying way to think about these three kinds of events. But, of course, you're perfectly free not to.[37]

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[34] Morowitz, 184: "A physicist is the atom's way of thinking about atoms."

[35] Ibid., 23: "It is a new concept; one not completely understood."

[36] W. B. Gallie, *Philosophy and the Historical Understanding*, 2nd ed. (New York: Schocken Books, 1968), ch. 8.

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