

The Scientific Falsification of Scientific Materialism (It's All Gap)

The proposition of scientific materialism

Materialism asserts that the universe consists entirely of physical components; nothing exists beyond the natural world. The notion of a supernatural Creator is rejected outright.

The scientific form of materialism rests on this proposition, adapted from a statement by Einstein^[1]:

It is possible, in principle, to demonstrate by experiment a natural cause for every event, thus scientifically eliminating God as the cause of any event.

There are two components in the statement of the proposition: the demonstration of a natural cause for every event, and the elimination of God as the cause of any event.

The demonstration is a necessary condition for the elimination. Without demonstration of natural cause, there is no elimination of God as cause.

If natural cause is demonstrated, does it necessarily follow that God is eliminated as cause? The answer can only be yes if belief in God is founded solely on ignorance of the natural world, and cannot survive in the presence of knowledge. Whereas, the Judeo-Christian assertion is that belief in God thrives in the presence of knowledge: increased knowledge of the natural world engenders increased appreciation of the Creator's genius.

There is thus a third, unstated component of the proposition: the assumption that God is not a real God, but a god of the gaps in human knowledge, to be driven out by the advancement of science. Scientific materialism assumes the thing it purports to prove, and so fails as a logical proposition.

Nevertheless, scientific materialism has a firm grip on the minds of many scientists, and on Western culture at large. In this environment, the abstract logical argument in the preceding paragraphs is not likely to be effective. It is necessary to evaluate the first component of the proposition on scientific grounds.

Accordingly, this statement will be tested:

It is possible in principle to demonstrate by experiment a natural cause for every event.

This is the burden of proof:

Whenever someone says, “God has caused this”, the materialist must be able, in principle, to point to the experimental evidence and say, “No, this physical factor is the cause.”

This is the burden of falsification:

It must be shown that the experimental results rule out, in principle, the discovery of a natural cause for at least one event.

Summary of the evidence

In a baseball game, the pitcher throws the ball at high speed toward home plate. Suddenly, the ball reverses course, and travels at high speed over the head of the pitcher. What is the cause of this event? The force of the bat hitting the ball, of course.

The laws of physics that govern this event are well understood, when the ball is considered as a whole. Given the mass of the ball and its velocity, and also the mass and velocity of the bat, the path of the ball into the outfield can be predicted accurately.

The situation is very different when the fine details of the event are considered. To appreciate the difference it is necessary to drill down to the smallest constituents of the ball: the different materials in the ball; the molecules in each material; the atoms in each molecule; the subatomic particles in each atom—its electrons, protons, and neutrons.

Advanced students of physics learn that an electron cannot be broken down into constituent particles; an electron is said to be a fundamental (or elementary) particle. Protons and neutrons, on the other hand, are composed of fundamental particles called quarks, the quarks being bound together by gluon particles. In all, physicists have identified 25 fundamental particles.^[2] Among these is the photon, the light particle. The photon is of immediate interest because it transmits the electromagnetic force.

When the ball hits the bat, the force is transmitted by photons, from electrons in the bat to electrons in the ball.^[3] The details of the interaction are beyond the scope of this article. The relevant fact is that the reversal of the ball's path is brought about by interactions between subatomic particles.

The branch of physics that deals with the behavior of subatomic particles is quantum mechanics. Nearly a century of experimentation has resulted in consensus on two key points.

First, every observed phenomenon in the universe, with the exception of gravity, resolves to one or more discrete interactions between fundamental particles.^[4] We have seen this in the example of the baseball. Another familiar example is the warmth we feel as sunlight—a shower of photon particles from the sun—excites electron particles in our skin.

With this first point in mind, the test statement becomes:

It is possible in principle to demonstrate by experiment a natural cause for the result of every interaction between individual fundamental particles.^[5]

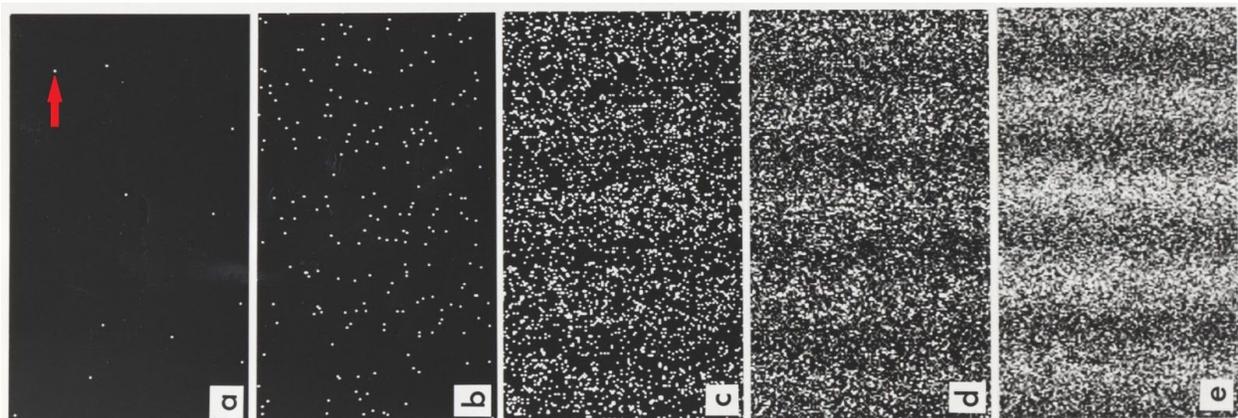
The second point of consensus is that it is impossible in principle to predict the outcome of an interaction between individual fundamental particles. The laws of nature at the particle level are statistical only; they are laws of probability, not laws of certainty. The physicist can calculate only the chance that something will happen, never what will in fact happen. Given an interaction with two possible outcomes, A and B, the probability of outcomes A and B can be precisely calculated, but there is no reason or cause for an outcome of A rather than B.^[6]

The consensus on this second point is broad, but not universal. Some scientists are not convinced that it is impossible in principle to discover a cause for the outcome of individual particle events. For the purpose of evaluating the proposition, the widely accepted view is considered the “orthodox” scientific view. The minority view will be considered after the evaluation. We proceed, then, with the orthodox scientific view: There is no cause for the outcome of any individual interaction between subatomic particles.

The well-known “double-slit” experiment illustrates the unpredictable behavior of an individual particle, overlaid with a predictable pattern of behavior in the aggregate of many particle events.^[7] The white dots in the series of images below mark the arrival of individual electrons at a detector, after having passed through a double-slit apparatus.

The red arrow in the leftmost (and earliest) frame indicates the location at which a single electron landed. That electron might have landed at a myriad of other positions in the frame. The probability of the electron landing at any given position is precisely known. But there is no reason or cause for that particular electron to have landed at that particular location.

The electron dots in the first two images do not reveal an obvious pattern. As more electrons arrive, a pattern emerges. In the final image, the alternating light and dark bands of a wave interference pattern are clearly seen.



Consider again the baseball's reversal on contact with the bat. The cause of the reversal is the force on the ball. That force is the sum of many individual particle interactions—not one of which has a cause.

When the reversal is considered at the superficial level, its cause can be identified. When the event is considered in the finest detail, there is no cause at all.

Physicist John Wheeler put it this way: "Society charges science with the task of prediction. Science makes some progress with the task. In the individual quantum process, however, prediction comes to the end of the road. Science does not have to be ashamed of its finding. It only has to be honest about it. Why demand of science a cause when cause there is none?"^[8]

The proposition may now be evaluated on scientific grounds.

Evaluation of the proposition

As to the burden of proof:

When someone says, "God has caused this", the materialist is *never* able—not even in principle—to point to the experimental evidence and say, "No, this physical factor is the cause."

As to the burden of falsification:

The experimental results rule out, in principle, the discovery of a natural cause for *any* event in the universe.

The outcome of the evaluation is clear: If the orthodox scientific view is correct, the proposition of scientific materialism must be false. Scientific materialism is falsified by science.

The Minority View Considered

The orthodox view states that there is no cause for the outcome of any individual particle event. The instinctive reaction of the rational mind is that there must be some as yet undiscovered factor which accounts for the observed behavior.

Wheeler addresses the objection: "Is there not some underground machinery beneath the working of the world which one can ferret out to secure an advance indication of the outcome? Some secret determiner, some "hidden variable"? Every attempt, theoretical or observational, to defend such a hypothesis has been struck down. Not the slightest hard evidence has ever been found that would throw doubt on the plain, straightforward prediction of quantum mechanics, the prediction that no prediction is possible."^[9]

In this article we do not attempt to judge the merits of arguments for or against the orthodox view. The critical point for the purpose of this discussion is the lack of hard evidence for a cause of particle behavior. Those who hold the minority view do not offer positive evidence for a cause; they simply doubt the certainty of the negative orthodox assertion. On this subject physicist Kenneth Ford says, “Nearly all physicists have made peace with probability, but some remain uneasy about it. I very much doubt that the last word on quantum physics has been spoken.”^[10]

The rational mind expects to find a cause for particle behavior. Science is not in a position to satisfy that expectation.

The Enigmatic Universe

The failure to find a cause for the behavior of individual particles is symptomatic of a failure to comprehend the natural universe. The failure to comprehend is sweeping, and debilitating—not to science, but to the proposition of scientific materialism.

In the final image of the double-slit experiment, the electrons are arranged in the alternating light-dark pattern of wave interference, yet there is no cause for any individual electron to have landed in the position it occupies in the pattern. How comes order out of disorder?

All of the fundamental particles exhibit repeatable, orderly, and breathtakingly beautiful^[11] patterns of behavior in the aggregate, yet there is no reason for the behavior of any individual particle. How come order and beauty out of complete disorder?

All of the ongoing order and beauty in the universe, from the nuclear fusion in the stars to the operation of the cells in our bodies, arises from the predictable behavior exhibited by quantum particles in the aggregate. Yet the behavior of the individual particles in those stars and bodies is entirely unpredictable. How comes our continuing existence out of chaos?

The materialist insists that these questions must be answered only with reference to natural phenomena. Under that restriction, this must be the answer: *No one has the least idea.*^[12]

The goal of scientific materialism is to increase our knowledge of the natural world, closing the gaps and so eliminating God as the cause of any event. As things stand—and as they will always stand, according to the orthodox view—it’s all gap.

Conclusion

Science currently offers no support for the proposition of scientific materialism. Moreover, if the orthodox view is true, scientific materialism must be false.

Emancipation

The scientist is free to consider whether the appearance of design that pervades the universe is evidence of a real supernatural Designer.

The theist is released from the charge of being anti-science simply because he is a theist.

Notes:

1. The proposition is adapted from this statement by Einstein:

All these [aforementioned] space-like concepts already belong to pre-scientific thought, along with concepts like pain, goal, purpose, etc. from the field of psychology. Now, it is characteristic of thought in physics, and of natural science generally, that it endeavors in principle to make do with “space-like” concepts *alone* [emphasis Einstein’s], and strives to express with their aid all relations having the form of laws. The physicist seeks to reduce colors and tones to vibrations, the physiologist thought and pain to nerve processes, in such a way that the psychical element as such is eliminated from the causal nexus of existence, and thus nowhere occurs as an independent link in the causal associations. It is no doubt this attitude, which considers the comprehension of all relations by the exclusive use of only “space-like” concepts as being possible in principle, that is at the present time understood by the term “materialism”.

The proposition is an adaptation of Einstein’s statement, rather than a condensation of it, because the proposition states explicitly what Einstein only implies: that it is possible in principle to scientifically eliminate God as the cause of any event.

Albert Einstein, “Relativity”, 1916. Appendix to 15th edition, 1952: “Relativity and the Problem of Space.”

2. See this article on subatomic particles: https://en.wikipedia.org/wiki/Subatomic_particle

3. Photons carry the electromagnetic force between electrons. See this article on the electromagnetic force: <http://www.thestargarden.co.uk/Electromagnetic-force.html>

4. See the **Overview** section of the Wikipedia article on the Standard Model of particle physics: https://en.wikipedia.org/wiki/Standard_Model

5. The modified test statement is less general than the original, as it specifies “every individual interaction between quantum particles” in place of “every event”, so excluding gravity events. For the purposes of this discussion, little is lost with the substitution, as there can be no gravity events without massive particles, and massive particles result from quantum events.

6. See Chapter 6 of “The Quantum World”, by Kenneth W. Ford (Harvard University Press, 2004)

7. See this Wikipedia article on the double slit experiment:

https://en.wikipedia.org/wiki/Double-slit_experiment

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See also Ford Chapter 9 for a discussion of the double slit experiment.

8. See John Wheeler's article, *Law Without Law*, in "Quantum Theory and Measurement", Princeton University Press, 1983. The article is also available at:

<https://www.scribd.com/document/397679925/Wheeler-law-without-law-pdf>

9. Ibid.

10. Ford, Chapter 9, at the end of the heading "Waves and Probability."

11. See the highly readable book by Bruce A. Schumm, "Deep Down Things. The Breathtaking Beauty of Particle Physics", 2004.

12. For a frank discussion of the ignorance of "the deeper foundations of the quantum", see again John Wheeler's article. See also Feynman, in the introduction to his series of popular lectures on quantum electrodynamics. He asks his audience, "Why are you going to sit here all this time, when you won't be able to understand what I am going to say? It is my task to convince you *not* to turn away because you don't understand it. You see, my physics students don't understand it either. That is because *I* don't understand it. Nobody does." (Feynman's book, QED, is published by Princeton University Press.)

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