

On the Necessity of Cause

SECTION 1

Analysis of Causality

Causality, or cause and effect, is influence by which one event, process, state, or object (*a cause*) contributes to the production of another event, process, state, or object (*an effect*) where the cause is partly, or totally, responsible for the effect, and the effect is partly, or totally, dependent on the cause.

Causality is one of the most fundamental and essential concepts of physics. Causes may be distinguished into three types: “necessary”, “sufficient”, and “contributory” cause. In general, an event, process, state, or object has several causes and all lie in its past.

Aristotle categorized four types of cause as “material”, “formal”, “efficient”, and “final” causes. The material cause of an event, process, state, or object is the raw material out of which it is composed. The formal cause is the pattern or form which makes the material into a particular type of thing, which we recognize as being of that particular type. The efficient cause is that which causes, precipitates, initiates the change from the prior event, process, state, or object to the current event, process, state, or object (the effect). The final cause is the purpose, that for the sake of which the efficient cause imposes the form on the material.

An essential component of causality is Mechanism, the mechanics of the thing. It is necessary to be able to explain how, by what mechanism, an effect happens. how a cause produces that effect, and to do so.

THE NECESSITY OF CAUSATION

Why is causation necessary ?

Each and every event, process, state, or object has characteristics, properties, that are specifically of it, that are such that their particular combination is different from all other combinations of events, processes, states, objects. That condition is automatic, naturally occurring.

If a duplicate ‘tried to occur’ it could not avoid having some subtle distinguishing properties due to, if nothing else, the new time and the subtly changing environment.

If that were not the case then any two events, processes, states, or objects exhibiting identical characteristics and properties would not be two, but would only be a single event, process, state, or object. That is so because there would be no way to distinguish between them. By all senses, measurements, experiences it would be impossible to count them beyond “one”. Upon the instant of an identical duplicate it would not be distinguishable and therefore it would not be. Instead it would be the same original.

But the universe is replete with events, processes, states, objects, myriad upon myriad. And, many of them appear to us to be at least nearly identical, from carrots to bumble bees. How does that come about ?

It comes about by each being the result of its prior causes, its Material Cause and its Formal Cause and its Efficient Cause (action) and its Final Cause (purpose). And, all of those causes being, themselves, events, processes, states or objects that resulted from their own sets of prior causes.

That is, causes cause causes each a variation on the prior. An identical duplication cannot happen. Without that constraint there could be no variety, no development, no evolution. Causes are essential because without them there could be no change.

There is a further reason for the necessity of cause.

Causation supports valid truth and limits the opposite.

“Every thing has a cause; and that cause has a cause; and “*ad infinitum*”. That is the only scientific “Law” not needing “Experiments” to establish it because every day life continuously demonstrates it. But there are cases in contemporary science that violate that principle, that fail to provide a cause. For example:

- Einstein’s General Theory of Relativity contends that mass curves space but the theory lacks a cause for the curving of space and of space being “curvable”,
- The “spooky action at a distance” of Quantum Mechanics lacks supportive cause.
- Heisenberg’s Quantum Mechanics and Uncertainty are missing sound causation.

Those defective theories have, and have had, profound adverse effects on society as follows.

Science on the large scale, that is science dealing with the fundamentals of reality and the universe, has always had, and still has, a major effect on the non-scientific, social, general philosophic thinking of that science's society and its leaders.

From the "Enlightenment" and the "Age of Reason" through Newton and the "Clockwork Universe" through to now Einstein's relativity, Bohr's Quantum Mechanics, and Heisenberg's probabilistic uncertainty, the thinking, beliefs and behavior of society have been strongly influenced by their then current science.

So today we have a society that bases its life on the general belief in, and acceptance of, that everything is relative, indeterminate, probabilistic, that there is no absolute Truth.

The great damage that such thinking does is the license that it gives to create, choose, decide upon one's own "reality" and then act accordingly.

Such thinking ultimately gives us war, rapine, holocausts, genocide.

And, upon the science of the 20th and 21st Centuries that gave us those ideas we can lay some of the responsibility for the horrors and tragedies of the those Centuries.

With causation being so essential, what about the universe itself ?

WHAT ABOUT THE BEGINNING OF THE UNIVERSE ?

Before the universe there was nothing, absolute nothing. That is the only state not requiring a cause because nothing is no-thing, is not a thing.

Now, a duration is the period of time that a particular state or set of conditions persists. The duration is terminated by a change, which change also initiates a new duration. Before the beginning of the universe a duration was in process even though it was not measurable. The beginning of the universe was the first change ever and it terminated the original primal duration of absolute nothing.

The probability of the happening of such an event is extremely small. But the event was, and is, not impossible. In the absence of the beginning of the universe the original duration would have been infinite and that infinite opportunity operated on by minute, but non-zero, probability results in absolute certainty. The beginning of the universe could not avoid eventually happening. [Efficient Cause]

Even the beginning of the universe, the first effect ever, had its causes. Those causes were not external to, nor independent of, its effect. Rather, that first cause was inherent in, embedded in its effect. It was [and is] :

- That an infinity is impossible in material reality,

and

- That the principle of conservation cannot be violated. Something from nothing is impossible.

Those two causes allowed the universe to have its beginning as follows.

To prevent an infinity, because the change from nothing to something would appear to require an infinite rate of change at least originally, the form of the first change had to be of the $[1 - \text{Cosine}]$ form, which accomplishes the change from nothing without an infinity and is an oscillation [formal cause].

To avoid violating the principle of conservation, with the start of the $[1 - \text{Cosine}]$ form there simultaneously had to have arisen an identical-in-form but opposite-in-amplitude $-[1 - \text{Cosine}]$ form so that the pair balanced out to the original net nothing, as in the equation below. [Material Cause]

$$(1-1) \quad U(t) = \pm U_0 \cdot [1 - \text{Cos}(2\pi \cdot f \cdot t)] .$$

Appendices A is a detailed development of this brief summary of the cause of the universe and establishes that the necessity of cause is valid and operates from the beginning of the universe to throughout its subsequent existence.

