Richard Kadel misuses the meaning of "theory" as applied by most scientists today. Theory as used today hardly means "speculation based on incomplete knowledge." In *Teaching About Evolution and the Nature of Science* (National Academy Press, 1998, available at http://www.nap.edu/readingroom/books/evolution98), a theory in science is defined as "a well-substantiated explanation of some aspect of the natural world that can incorporate facts, laws, inferences, and tested hypotheses." Laws are "typically descriptions of how the physical world behaves under certain circumstances."

There is no suggestion that either is more certain than the other. In fact, when I teach my geology, physical science, and Earth science students about the scientific method, I stress that both laws and theories are as certain as we can make them, both are testable, and in the light of new evidence, both can be modified, overturned, or replaced. The big difference is that a theory is usually explanatory, while a law is usually descriptive and often quantifiable.

To define a theory as speculation is to fall into the trap that many nonscientists have fallen into when dealing with such controversial theories as evolution. There are generally enormous amounts of data to support theories and laws. Without that data, we usually refer to "hypotheses" to suggest the greater degree of uncertainty. In fact, most laws and theories start out as hypotheses.

I do agree that Einstein's formulations should be called laws. However, that's not because they are more certain now; it's because they are quantifiable and descriptive. But we still need to refer to Einstein's theories as well, because they explain why the formulations work.

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Isaac Newton offered us his laws of gravity, describing the attractive force between masses, but refused to offer a theory. Instead, he famously stated, "I have not been able to discover the cause of those properties of gravity from phenomena, and I frame no hypothesis. . . . It is enough that gravity does really exist, and acts according to the laws which we have explained.''

An attempt to boost the status of special relativity by referring to it as a law rather than a theory would actually have the opposite effect of demoting Albert Einstein's astonishing contribution. He didn't describe his (or anyone else's) observations, he described and explained real phenomena before anyone even knew they were there.

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Albert Einstein used the term "principle of relativity." My dictionary defines a principle as "a fundamental law that describes how a thing moves, works, or acts," which seems quite appropriate. Perhaps we would honor Einstein best by using his own words.

I actually prefer the word "theory" despite the pejorative view held by the general public. It reminds us that scientific theories cannot be proved, but only disproved. We always exist in a state of incomplete knowledge. When someone says to me that evolution is only a theory, I like to point out that gravity is also a theory, and a very useful one at that.

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Kadel replies: Vladimir Krasnopolsky writes that special relativity has several authors and specifically mentions publications by Hendrik Lorentz that were earlier than Einstein's 1905 paper. One reader wrote to me indicating the contributions of Henri Poincaré, and interested parties can find a summary of Poincaré contributions, with accompanying references, on Wikipedia (http://en.wikipedia.org/wiki/Henri_Poincar%C3%A9#). Evidently, he promoted Lorentz's work and, before 1905, promulgated the "principle of relativity" and an early form of $E = mc^2$ regarding the properties of emitted radiation. Recollecting from my undergraduate education, I believe it is correct to state that Einstein was the first to derive special relativity without reference to electromagnetism and the first to write down what we sometimes call the equivalency of mass and energy, or what I referred to in my previous letter as Einstein's third law.

An internet search on "Einstein's laws" returned hundreds of websites that use precisely that terminology when referring to special relativity. Included among them is the "Laws of Science" (http://en.wikipedia.org/wiki/List_of_laws_in_science), which has the energy of photons, special relativity, and general relativity all under Einstein's name. So it's hard to be original, and the general public may be ahead of us—or at least me—in this discussion.