



McGill
University

Foundations & Philosophy of Science Unit

Prof. J.-M. Lévy-Leblond

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Dear J-M

I have read with pleasure (derived from learning) the reprints and pre-prints you sent me recently. I quarrel only with ~~the~~ ^{the} points you make.

1. When introducing (in a masterly fashion) the three different speed concepts you do not define them operationally. What you show is that the three different measurement techniques determine values of three different functions, each of them representing a different property. In other words, there are 3 different properties--velocity, celerity, and rapidity--which are conceptualized differently and measured differently. No measurement, however refined, can build the concept ds/dt or the concept $c \arctan \frac{v}{c}$. Different measurement procedures may, or may not, suggest concepts $\frac{v}{c}$ but they do not define them.
2. Your plea for epistemological pluralism is double-edged. I am all in favor for philosophical pluralism within bounds; epistemological anarchism (Feyerabend's "anything goes") will easily lead to pseudoscience and antiscience. Take two examples. A subjectivist epistemology will discourage experimentation; and an ontology accepting immaterial entities, such as ghosts and disembodied souls, will discourage investigating the brain as the organ of thought. I am as much against philosophical monolithism as you, but I think one must criticize the philosophies that block scientific research and develop those which favor it. Otherwise we will end up, as Feyerabend has, by embracing astrology alongside astronomy.
3. The derivation of SR from the group theoretic properties of spacetime is certainly very elegant but seems to me to be logically circular--as ~~is~~ circular as the derivation of some portions of classical electromagnetism from special relativistic kinematics. Indeed if you postulate the Lorentz metric you can derive lots of things, but how do you justify the metric itself, and in particular the occurrence of c in it? Pure mathematics has no place for c other than as a real number; indeed it has no way of distinguishing time from space. Worse: when dealing with spacetime independently from things one loses sight of the very referents of SR and so one ends up by not knowing what SR is about--namely physical things. To put it in another way: if one starts from the geometry of spacetime then one must feign (if one is to build a physical theory) that spacetime is a physical thing, an entity existing by itself. But there is no experimental evidence for the autonomous existence of spacetime. Worse, how does one introduce genuine things on top of spacetime? The only possible strategy would be geometrodynamics: the only reality is spacetime (matter without matter, etc.). But this has failed.

Apologies for writing in English: doing it in bad French would have taken me the whole morning.

Warm regards also from Marta.

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