

AT THE SAME TIME

[I find] a certain satisfaction in the older interpretations, according to which the ether possesses at least some substantiality, space and time can be sharply separated, and simultaneity is not relative.

Hendrik Lorentz (1913)

We cannot attach any absolute signification to the concept of simultaneity, but that two events which, viewed from a system of coordinates, are simultaneous, can no longer be looked upon as simultaneous events when envisaged from a system which is in motion relatively to that system.

Albert Einstein (1923)

Another time has other lives to live.

W.H. Auden (1940)

The postulation of preferred hyperplanes of simultaneity in the structure of space-time is, in fact, the only position which does not face severe difficulties.

William Craig (2008)

I wake with that feeling one has after trans-Pacific travel. My room momentarily seems strange. Then the dizzy geographic shift before I step into the ocean haze. It's thick and leans against the shore, spilling in above the cliff. Morning haze is normal. It burns off by noon. But today it somehow adds to the sensation of arrival in another place and of a shift in time.

Perhaps it comes from too much heavy thinking on the beach last night. The question was: In light of the Beginning, what *is* simultaneous? What does it mean? How does it work? It may sound easy but this puzzle has bedeviled better minds than mine.

Lorentz is the inspiration behind Einstein's relativities. But he doesn't buy Einstein's interpretation of SR, which says there is no way to say events in different places coincide in time. It depends, says Einstein to Lorentz and to the world, on motions of observers. Lorentz begs to differ. In the end, Einstein appears to win. But is he right?

Science says truth is whatever works. Having something work a thousand times does not prove it'll work again though it is human to assume so. But failing once says that it doesn't work. So science is made up of suppositions that, having been well tested, haven't failed yet. Supposedly. But actually not.

Being (contrary to rumor) human, physicists become invested in their work.

They hang onto their failing theories, citing many reasons. A detective should assimilate this without fuss. He should know that physicists' continuing attachment to SR can be explained no other way. It fails one test every time. The test it keeps on failing was invented for QM—Bell's test, whether spooky action at a distance really happens. It shows the universe must be non-local. Thus SR is okay if it's kept in its cage, predicting measurements of rods and clocks. But of non-locality it makes no sense whatever, which wouldn't matter much except that physicists keep building physics with SR. This is the physics version of an ostrich act.

Here I am then, steeped in weeks of Einstein and bedazzled by Frank's universe. Bell shows some things *are* simultaneous. Simultaneity does have a meaning; it's independent of who's moving. Frank's Tocks seem to explain it. Or, put another way, the 3-D universe *is* what is simultaneous. SR simply says it can't be measured using rods and clocks. Before SR, Lorentz told us that.

Mach, who doesn't see the universe as suitable for study, might nonetheless approve. In 1883 he writes, '*In der Natur gibt es keine Ursache und keine Wirkung. Die Natur ist nur einmal da.*' It translates, *if* it translates, as: 'In the real world there's no cause and no effect. The real world exists only *once*.' His 'einmal *da*' sounds like a Move to me. And it sounds simultaneous.

SR deals with measurements, GR with geometry. Measurements are all about appearances—how reality appears to be, not how it is. Geometry is pure ideas with no connection to reality. Einstein says, '[Geometry] is not concerned with the relation of the ideas involved in it to objects of experience, but only with the logical connection of these ideas among themselves.' QM says between measurements there *is* no reality. For most of the last hundred years, physics hasn't studied what is real.

Entangled particles display simultaneity. All they do they do together. That's what's measured. That is real. But this same simultaneity, though measured, can't be used for making measurements. Do I hear an echo of Frank's lock-step universal factory where he cannot detect the Flecks? I'm still not quite sure what it is but now I buy it, wish I never doubted him, wish he didn't know it when I do.