

A TALE OF TWO TROUBLES

Day after day, day after day,
We stuck, nor breath nor motion; As idle as a painted ship
Upon a painted ocean.

Samuel Coleridge (1798)

Oh yes we've got trouble, trouble!

Meredith Willson (1962)

I believe that we are going through a period of profound confusion,
in which we lack a coherent general picture of the physical world
capable of embracing what, or at least most of what, we have learned
about it.

Carlo Rovelli (1997)

One might have thought the death of the most famous scientist in
history 50 years ago might have merited some coverage. Not a bit of
it: the passing of Albert Einstein in 1955 has failed to register on the
cultural radar. ... Perhaps it is not so surprising, given that by the
time of his death at the age of 76 Einstein was regarded as a has-been.

Robert Matthews (2005)

For me these days are hard. It is three days since anybody spoke to me.
Milne's ditty echoes in my head:

King John was not a good man
—He had his little ways.
And sometimes no one spoke to him
For days and days and days.

I walk out on the pier to buy a snack. An eagle circles overhead, finger
feathers flaring as it finds the updrafts from the slope. A girl short-changes me on
some potato chips. I tell her keep the change. She laughs and thanks me. Modern
conversation.

The Metro car is almost empty so I sit and drift. An insight came to me as
dawn descended on the shore. Ideas, concepts, words are all somehow iconic. In
our minds they found the common weal. There are languages of harshness and
retribution. There are languages of hope. This thought seems urgent but nobody
notices. Where urgent icons lurk, philosophy meets physics. Having kicked off his
Lucasian career by heralding the end of physics, Hawking now declares philoso-
phy is dead. Shocking, as this is his doctoral degree. Fearlessly he fills the vacuum

with a book of new announcements. Walking in I drop it on the bookstack on my desk. Has physics lost its way? Lee Smolin says so. He says physics is in trouble. A fearless physicist himself, he too takes time to write another book. I pick it up. My thoughts run in the same direction: Trouble. Something—is it amber cover, shoes with laces tied together?—punches buttons in my brainstem that inject adrenalin. Instantly I'm dying in the chair. Days or maybe moments later, pulse still pounding, I return to living—yet another seemingly improbable survival. But then sweat breaks out again as links click in. The LHC. Black holes and terrorism. Physicist in Paris. Police. As I punch them into Google, foggy recollection is confirmed in milliseconds. Headline: 'Black hole scientist at "Big Bang" Hadron Collider lab held as suspected Al Qaeda terrorist.' I see that I must ante up; I see that she is trouble.

What would he say? Would he say I see it now because I'm writing about trouble? This provides escape from terror and my body sags back into torpor with the book—its amber cover now seems harmless—open in my hand. Tomorrow will be time enough to worry about trouble in Colliderland.

And so back to Smolin saying physics is in trouble. He says it is losing its connection to experimental test. It costs a lot of money. Money tends to follow action; then the action follows money. Too much money, he says, follows strings. His thesis is new physics wanders in a theoretic wilderness. His question is: What should it do? I have a thesis of my own. I think that this is not the only trouble. All those for-Frank briefings frame another: Quantum physics is a preemie. Physics stumbles on QM before it has a way to understand what it has found. Born too soon, untimely ripped as Will might put it, it is sickly. Like my mental image of those Roswell scientists dismantling a UFO for sixty years. I can imagine their frustration, handling marvels far beyond their grasp. Several generations of them now—if true, that is; I don't go in for it myself—who have it but don't get it. So too with QM and physics.

This casts Einstein as a troublemaker, innocent of course. It's heresy to even think this way. He saw too far; he saw too soon; he understood too much for us. We have yet to come to terms with him. This is not the truth; but it is true. He gifts physics riches, an inheritance it cannot handle. *Nouveau riche*, it cuts connections with its philosophic wellspring. This, as I look back, looms as a second or it could be first and worst of troubles. Of this trouble he himself may be aware. In the 1920s he is 'working strenuously on the further development of a theory on the connection between gravitation and electricity.' His efforts earn him ridicule; there's no 'further development.' There's no development at all, and the Beginning says the reason's simple: There is no connection. They aren't forces that were once merged, in the nascent universe, and so susceptible to being

merged again by math or big machines. They are two incommensurable things.

So, what to do? Well, Frank says fix this trouble. He means: Understand it. This is what philosophy is for and this is all that his Beginning offers: It's a way to understand.

Smolin fingers five great problems not as troubles but they are unsolved. He says:

1. Combine general relativity and quantum theory into a single theory that can claim to be the complete theory of nature.
2. Resolve the problems in the foundations of quantum mechanics, either by making sense of the theory as it stands or by inventing a new theory that does make sense.
3. Determine whether or not the various particles and forces can be unified in a theory that explains them all as manifestations of a single, fundamental entity.
4. Explain how the values of the free constants in the standard model of particle physics are chosen in nature.
5. Explain dark matter and dark energy. ... More generally, explain why the constants of the standard model of cosmology, including the dark energy, have the values they do.

What would my detective say to Smolin? He could say the answer to the third question is 'Yes.' And that the single entity—the Tweedle—is right under Smolin's nose. He might answer question 5 at length. But most of all, he'd say that there's a whole new way to think about these problems. He'd say: You don't have five problems, you have one: How did this begin? Once you find that answer you will understand the rest.