MOVING ON

A country bumpkin waits upon the shore
For the river to flow by him and be gone
But the river keeps on flowing as before
It flows unending and for ever and anon.

Horace (20 BCE)

The ultimate theory will be one of space and time again.

Charles Galton Darwin (1928)

***Something unknown is doing we don't know what*—that is what our theory amounts to.**

Arthur Eddington (1928)

What is of interest is … the ordinary physical world revealed in its fantastic aspects.

Donald Friedman (1983)

If empty space is something, and if now you place a body in this empty space, you would have two 'somethings' at the same point at the same time.

Frank Close (2009)

He hasn't said a word today. It's more than just no voice; there is an empty-building feeling that he's not at home. His absence seems to hold a trace of threat. It flashes me a haunting memory. Grade two. Teacher's left; we wonder when she will return. We study. We are well behaved. The scene disturbs me for no reason. It's as if I'm out of line. At any moment I may hear him, teacher speaking from the hall. Why my disquiet?

What has he done to GR? It is his question. In a sense it's Markopoulou's too. She says GR is only an effective theory. I think he thinks what I do is easy. Cruising physics papers, picking clips from here and there. There are a half a million physicists; most of them are writing every day. Not many would agree with Markopoulou, for example. How come I choose *her* opinion for him? She has—for my money—the right stuff. She asks searching questions. She is intellectually tough. Bringing her and others like her to him feeds him. It's the best that I can do.

Of course I worry then when he agrees with her: Is all his knowledge just a heady version of you are what you eat? His Beginning says GR is an effective theory, an approximation to the way space is and how things move. It ushers in a

whole new view of space but it has no pretensions to reality. Kennedy says (of SR but it's also true of GR in a deeper way): 'Einstein's *theory* … does not mention reality; it merely describes relations between measurements, that is, between appearances.' The Beginning too provides a new view. Unlike GR, it is totally Relational. And it *does* describe reality, or tries. The difference is, it is not a theory. It's only an ontology, a metaphysic searching for a theory like an Oscar nominee who's shopping for a gown.

His metaphysic answers Close's puzzle. Actually, Close—another Frank I note—is quoting Aristotle. As I read it, I think: This is simple! *His* space—my Frank's—*is* what Close Frank's body's made of. There's no problem of the body and the space at the same point at the same time. Each body's *made* out of the space it occupies.

Like Markopoulou my Frank's saying that rethinking physics involves letting Spacetime go. Oops! There goes relativity. How can it re-emerge? I try to think the way that he would think. Why *is* GR effective? Why would it work at all? He would ask a question that goes back to basics. Like: What is it about?

Overall it is about the mystery of motion. How does an object move? And what does it move in? It's *not* about: What makes the object? The Beginning tells me all three questions start from the same place: the bits of space.

Step one: Space quantized into Flecks.

Step two: Flecks linking make the mass.

Step three: All else arises from the Flecks.

Is it this simple? Links and twists are quantum properties of Flecks? Matter's simply Fleck Links twisted and then braided? Objects are just giant gangs of braided twist? How do they move? I see it now in my mind's eye as, Fleck by Fleck and Tock by Tock, they move in his revisioned space. Roll the UC dice and play the quantum odds. Odds are what a fundamental quantum theory will be all about. Every detail of their moving's quantized. Each Move each twist flips—or doesn't—through one or the other of its neighbor Flecks.

Why do mass gangs hang together? Physics has begun to find a fundamental answer; this is where eventually GR should emerge. I take a break to read a book—some lectures Lorentz once gave in New York. Paging through I see that in 1906 he says:

> Indeed, one of the most important of our fundamental assumptions must be that the ether not only occupies all space between molecules, atoms or electrons, but that it pervades all these particles. We shall add the hypothesis that, though the particles may move, the ether always remains at rest. We can reconcile ourselves with this, at first sight, somewhat startling idea, by thinking of the particles of matter as of some local modifications in the state of the ether. These modifications may of course very well travel onward while the volume-elements

of the medium in which they exist remain at rest.

This blows me away! It makes me think that physics, once it's on the rails again, may soon escape the Cave. Me, I try to rest my mind by exercising my own question: It takes time and effort—why do sparrows sing?