THE ROAD TO REALITY

It is wrong to think that the task of physics is to find out how nature is. Physics concerns what we can say about nature.

Niels Bohr (1926)

I still believe in the possibility of a model of reality—that is to say, of a theory which represents things themselves.

Albert Einstein (1933)

Fiction in any form has always intended to be realistic.

Raymond Chandler (1944)

He said *my* character, quite calmly, and the amazing thing was that I never turned a hair.

Jules Maigret (1950)

You'll find reality to be quite a bit different than you thought.

Frank Herbert (1976)

That is the founding assumption of science—that there is a real world out there that we can make sense of.

Paul Davies (1995)

Fraser: It's a curious thing, reality—isn't it?

Walter: Yep.

Fraser: So much of the time it seems to be —a matter of what you believe.

Paul Haggis (1995)

"Just a hacker. He admits it."

Jarring outburst. I lie still. I want to move.

"Why should he run the show?

"His head is full of simple pictures.

"*I'm* the one who does the work.

"He doesn't even *talk* to me, not really. I'm just his character, *his* creature." A hissy shriek.

"*His* book is how he thinks of it. He'll get *his* name on it because he *has* a name. A name that he's been hiding. But I have it. It's . . ."

I snap out of the trance into a gallon of adrenalin. The daydream nightmare, I now realize, was real. So is my pounding heart.

He's silent as I try to calm my thinking. How could he get loose? I never

thought about control. Or if I did, I was just wishing he would come at call. He was, I thought, like Gilbert's Ruler of the Queen's Navee who never thought of thinking for himself at all. My fault. I know that there are precedents. You could say I was warned.

There's Maigret who sets out to write his memoirs, just like that; suddenly his author is *his* character. He gives him a pseudonym: 'George Sim'. He complains about Sim's treatment of his cases. *His* cases! According to him Simenon says, 'The whole problem is to make something more real than life. Well, I've done that! I've made you more real than life.' It's *Maigret* who is writing this! He's using Sim as if *he* is a character and putting words in his own author's mouth. And this in print? He writes, 'I remained speechless. For a moment I could find nothing to say, poor unreal policeman that I was.' Ingrate! He knows that he's unreal! Where would he be without his author? So it couldn't be allowed. I mean, the book was published, but its author is Georges Simenon and Maigret is *his* character. It's Simenon who calls the shots. He's the one who's writing, as is only right; he's the one who's speaking—so to speak. He's weaving his words into Maigret's voice.

Nabokov, lepidopterist and novelist, chess-playing émigré habitué of Berlin in its Einstein days, is the grand master in this business. Deftly, in complete control, he parries shots from Martin Gardner: Math maven Gardner becomes fiction in Nabokov's novel, *Ada*. Or *Ardor*. Ardently Nabokov says:

> 'Space is a swarming in the eyes, and Time a singing in the ears,' says John Shade, a modern poet, as quoted by an invented philosopher ('Martin Gardiner').

The best bit is that Shade, whose quote creates a *real* philosopher, is himself a fiction although some say he's a stand-in for Nabokov's father, accidentally assassinated in Berlin. It is no accident that what Nabokov adds to Gardner is an I.

I'm calm. It's clear we need some rules: I'll let him have his voice; he can't use mine. And in the end the fact is that his voice is mine to write. Or not. There's nothing fair or unfair in it. It was Buechner I believe who said, 'It is as impossible for man to demonstrate the existence of God as it would be for even Sherlock Holmes to demonstrate the existence of Arthur Conan Doyle.' Which I take to say—and I agree—that authors call the shots; it's just the way it is.

Maybe this sounds simple but it's not. Meaning no pun, it's so heady that it's easy to get lost. Take for example *The Locked Room*. Its authors introduce a character called Sundholm. He's an expert on crimes seemingly committed in locked rooms. So far, so good. So what! as Megadeth would add. So then this expert writes a study. It's called The Locked Room. Another character—a fiction—in the real *The Locked Room* now starts quoting from the study called The Locked Room which is written by another fiction in the real book. Keeping track of characters and authors spins me dizzy.

To give credit where it's due, it's him, it's *he*—my character—who does our heavy lifting. Should I call it the inventing? Call it what you will Steve Hill, he is *my* character not vice versa. I refuse to share the fate of Georges Remi, another Belgian by the way, whose life was taken over by his almost-Belgian character Tintin. I am not kidding.

Like I say it's heady stuff. It calls for care. Look what happens to Dan Dark. Of course it's a mistake for him to do the movie. Mistaken for me too to see it, I suppose. His character, another fictional detective, up and kills him and then takes off with his wife. Mind you, he is delusional. He does dumb things, like gives his character a gun. It is his script that does him in though; he should not have cast himself as the detective. This is in the film he writes inside the film. Or is it all in his imagination? Anyway, Dan asks for trouble and he gets it. It just goes to show the mess an author can get into if a character gets out of hand. I'm glad my guy is here but I'm concerned that he could come unglued. I'd be the loser if he lost his grip on his small world. *Honki de iku ze*.

For centuries philosophers debate the nature of reality. Newton adds his physics to the fray. His laws of motion span the range from ordinary objects to the planets. His space and time provide a new reality that rules the roost for some 200 years. In the early 1900s relativity replaces it. As tests confirm its startling predictions, Einstein's view that physics' space and time aren't really *there* comes into vogue. A generation later, QM brings a *new* new view. It seems to say that nothing—except space and time—is real until it's measured; the reality one measures hinges on the measurement one makes. Reality, it hints, is manufactured by the measurer! It says that everything is captured in a ψ that isn't real. Einstein and his colleagues put up a forlorn resistance, saying that when something's known for sure *that* must be real; QM is accurate but its description of reality's statistical; it gives the odds on everything but explains nothing; it is incomplete. There must, says Einstein, be more to reality than it lets on.

And *Trevor* seems to know this, likely without bothering to think a lot. He is the twelve-year-old who's holding an Olympic torch. Telling us of Trevor, a reporter named MacGregor seems to know this too though right away he hedges:

> "It's an *actual* experience," said Trevor.
>
> And the others agreed, not exactly sure what he meant.
>
> But then, who among us can say what this means?

The italics here are Trevor's. Well, MacGregor's actually. After all, he has made Trevor, real though *he* thinks he is, into his character.

In the later 1900s, physics manages to test some of QM's bizarre predictions. It works every time. Weird though it may seem, reality behaves the QM way. There might as Einstein says be something more but if there is it's something that nobody

in his time can find.

Frank's Beginning has its Rules and they are purely quantum rules. There are quanta and there's nothing else. In other words, a quantum theory of the Beginning is the Theory of Everything. It says non-quantum laws are just the way the quantum queerness looks in bulk to things like us. So when they make their way from ToE to QM, physicists should find there's room for Einstein and for Trevor too. But the Beginning doesn't ask reality to be QM. Quite the opposite; QM cannot describe the universe. Space quanta are the basis of reality; QM says they are nothing. *The* theory of real space will be a theory of not quanta *in* space but of quanta *of* space of which QM says no word.

His silence is still deafening.

So, yes Trevor, your reality is real. It's a victory for common sense and Davies should be pleased. But what of relativity? He keeps on asking. Could it be that he is waiting for an answer? It is relativity that rings the changes on realities of space and time. It is Einstein who, before QM gets going, takes them down. In this it seems he's wrong. And—should we be surprised?—he is the first to say so, though it is in 1920, when the world has ceased to hang upon his every word. He says it all in an address in Leiden. Not in passing, not in any incidental way: His speech is all about his change of mind. It is of course in German, but in 1922 the team of Jeffery and Perrett—a physicist who has no German and a linguist who lacks physics—publishes an English version in a modest monograph, now out of print and worth a mint if mint is its condition. Einstein makes no bones about recanting his position; for him maybe it's just another twist along his trail. For me, when I first find it, sun begins to shine, for this is when I know that Frank's for real.

He calls it 'Ether and the Theory of Relativity.' What do the students and professors think as they await the greatest physicist the world has known? Having said the ether's dead some fifteen years ago, he is now making it the subject of a speech? His delivery, when he begins, is classic Albert—vast ideas seeming simple through seductive reason. I close my eyes and hear him: '*Wie kommt es zu sein …*,' unassuming or, perhaps, colloquial, '*Wie ist's …*,' is how he begins: 'How does it come to be that alongside the idea of ponderable matter, derived by abstraction from practical experience, physicists should set the idea of another kind of matter, the ether?' Here observation's set aside as merely *seen*. He speaks with power as, so far as I can find, he has not done before or since, of what is *real*. Why? Well, *I* would say, because he sees it not with his eyes but with his mind. He understands it now. It takes time and that long letter from Lorentz for him to piece it all together. And here it is: 'According to the general theory of relativity space is endowed with physical qualities; in this sense, therefore, there exists an ether.' He gives credit where it's due: 'Thus we may also say, I think, that the ether of the general theory of relativity is the outcome of

the Lorentzian ether.' With, I think, but one exception: The condition of *his* ether everywhere depends on everything that's going on around it. He goes on:

> But this ether may not be thought of as endowed with the quality characteristic of ponderable media, as consisting of parts which may be tracked through time. The idea of motion may not be applied to it.

It's too little and too late and the wrong language and wrong place and the wrong time to get the world's attention. The ether is already dead and even Einstein cannot breathe life back into it. Thus, thirty years after the Leiden lecture, Infeld—colleague, friend and latter-day co-author—could call the ether entirely superfluous for understanding modern physics and then credit this to Einstein.

How far—beyond 1920—does Einstein see down the road? Not far, it seems. He offers up a grudging triple-negative acknowledgment that someday quantum theory might play a role—the kind of clumsy sentence only German can imbue with style. Soon Einstein is beguiled by siren songs of synthesis: The forces should be one. He does not get the message—unsurprising, as it comes of late from quantum theory, a messenger he is unready to receive—that there are two sides to everything.

His voice is strangely silent through my turmoil and this triumph. Is he sulking? Or, the pang strikes sudden like a dagger in my gut: Could he be gone?