

# MATTER OF FACT

The history of theories of matter has swung like a pendulum from  
simplicity to complexity to simplicity to complexity.

Martin Gardner (1964)

In 1956, when I began doing theoretical physics, the study of  
elementary particles was like a patchwork quilt. ... The theory we  
now have is an integral work of art: the patchwork quilt has become  
a tapestry.

Sheldon Glashow (1979)

There is a vast literature through the centuries mentioning the bee  
as a geometer.

Thomas Hales (2001)

The question of why the Universe is as it is, is inextricably linked to  
that of why fundamental physics is the way that it is.

John Barrow (2007)

Most of us particle physicists believe that if we could examine  
particles down to some incredibly small size scale, we would begin to  
see the hidden machinery that makes them tick.

Leonard Susskind (2008)

It's been a while since I was in a supermarket. It seems this is the place to  
go these days to find a small book-backup pack. On sale, nine ninety-nine gets  
me eight Gigs. I stand in line. Bar-code-decoding checkout chips chirp at each  
other like an Ozzie gullyfull of Bell-birds.

And, softer than slumber and sweeter than singing

The notes of the bell-birds are running and ringing.

Poem pondered in prosaic place. Why is it only Ozzie never Newzie bell-  
birds chime that checkout note?

At the office I soon find he's back! Frank, other Frank, that is. Near noon  
I'm working on what matter's made of when he eases through the door. He  
hasn't been here for so long it's like he's out of place. Without much thought  
I've sort of moved into a different space. Frank now means *my* Frank, not this  
somehow less-than-real intruder. What do I say? I mean, he doesn't work for  
me. Maybe he doesn't work at all but is it any of my business? Maybe he's been  
working hard at home, combing through the clues, though even if he said so I  
would not believe it. He fronts up to my desk. His butt does its Stinger missile

thing. For one downbeat he doesn't speak. Then with a phony friendliness he essays: Hey sport! How are things? And I can't help myself. I'm mesmerized. Timing, intonation and proximity conspire to teleport me into *Taxi Driver*. My brain is in stupid mode. I wait for the pimp-business question. When he doesn't ask it I know that the next one will be: You carry a gun?

What's new? he asks instead.

Of course he says it without meaning, elevator talk without the ride, but the situation sticks me. Yanks me out of *Taxi Driver* and into a question I can't duck. So where've you been? is all that I can think of to deflect it. Luckily I manage not to blurt it out. One more brief embarrassing eternity. The moment passes as he tries one more time: How've you been?

Blessed are banalities. I shrug and somehow it's enough to break the ice. He turns and squints across my screen but he can't read it, not from where he is. He doesn't really try. It's a nervous gesture and I recognize *he's* antsy. As he should be. He's the one who's sluffing off. Maybe he thinks that I'm pissed off at him. My systolic slowly settles back below one-sixty. He moves to his desk. Before he gets there he can see that there is nothing printed. Does he think that I do briefings *in absentia*? He boots and sees there's nothing new. I haven't said a word. My eyes are staring at the screen or maybe forty feet behind it.

He powers down and with a smooth swift movement steps to her desk, slides the top drawer open, seems to take or leave some small thing, shuts it, all in silence. Does he think I didn't see?

See ya tomorrow. He swings by me to the door.

Right, I mutter. A moment later as he pulls the door behind him I think that I *hope* that's what I said. *Not!* is what was leaping to my lips.

"They're going to be grumpy," his voice says suddenly.

Shaken, I try to imagine who will know that Frank is gone.

"Physicists." He's stuck back on another planet. "They won't be happy taking cues from a detective. A *fictional* detective will be worse."

I can tell that he takes pride in being fictional. Still shook up, I reread what I'm writing.

The matter in the Manifold has bugged me all along. The question is: What *is* it? B-T says it's dees and dums but this just ducks the question. He says they're twisted left or right but what exactly *is* it that he twists? And what do braids look like? These questions lead me back to arXiv and more papers from the twisty-braidy crew. They write about how twists may stay or move, and how they hang together, glueless, in some loose-but-not-quite-losing way like sparrows, singing of an evening, calling to the hedge each daily stray.

Their writing waxes mathematical, yet sometimes, somewhere in their braids and symbols, I find glimpses of such sparrow song. Herbert, saying, 'We may not appear to dance together, may not use the same steps or rhythms but we are seen together.' Properties of braided particles, they say, may be conserved. But as to what is braided, it is twists; and what is twisted is a concept with a label: It's a ribbon. Nothing more is said.

All their waxing puts me back in mind of bees. My conception of Flecks stacking to make space is stuck on some six-sided structure that comes back to mind repeatedly as if it's found a home. I know it's wrong; I just can't help it. Now that twists and braids have captured my attention I can't fit them in my picture. My brain sees bees making beeswax. But it seems B-T is saying: Wax makes bees! He may be the first to show how particles derive from space. In other words—my other words, not his—from Flecks. Every which way that I look at this it comes down to a single vexing theme: What *is* it B-T twists?