THE ORIGIN OF LUMPS

I now demonstrate the frame of the system of the world.

Isaac Newton (1687)

We must fall back on the old axiom that when all other contingencies fail, whatever remains, however improbable, must be the truth. Here all other contingencies *have* failed.

Arthur Conan Doyle (1908)

What possible justification could there be for the choice of a particular boundary condition—aside from the fact that it works, i.e. that it leads to what we observe?

Craig Callender (2001)

According to inflation, the more than 100 billion galaxies, sparkling throughout space like heavenly diamonds, are nothing but quantum mechanics writ large across the sky. To me, this realization is one of the greatest wonders of the modern scientific age.

Brian Greene (2005)

Even the hardest of the sciences depend on a foundation of metaphors.

David Brooks (2011)

Even in the morning what he is revealing keeps amazing. Dark Energy, which Clifton and Ferreira call 'the greatest challenge facing modern cosmology', turns out to be simple. It is *space*. That space is real makes a lot of sense. But the problem of the lumpiness of matter in it—how the dispersed atoms fell into and made each vast potential well—he said some time back seems the toughest one to crack. I wonder if he'll ever solve it. As I'm thinking this he says:

"It *is* solved. Greene is right. Or more or less right. It is quantum theory, but not QM."

From him this is a speech, an exposition even. The answer, it emerges, is apparent after he envisions the first Move.

"It follows from the Fizzion rule. It's quantum-random. Matter starts out lumpy."

I get the idea. After its first Move the universe must have a bigger and a smaller half, though the two Flecks are the same: Fizzion doesn't split the matter equally. Move 2 turns each of the two Flecks into two replicas. But each divides its matter unequally. Now there are four. Next Move they divide their random matter quantities and do it randomly again. *Und so weiter*, as Die Toten Hosen

and the Germans say. The odds are astronomical against an exact halving of mass-energy in any one division. And it would make no difference if one *was* exactly equal. By Move 20, or some 10^{-42} second after the Beginning, there are 1,048,576 Flecks, all identical but with different amounts of mass. Each one of them is destined to become a millionth of the universe. Size-wise they are equal. But mass makes some more equal than some others. That there are from the Beginning differences of density on this scale says there *is* no problem of explaining lumps. The problem I can see is on the flipside: Why are they so smooth in the Big Flash?

Early Flecks are lumpy. Maybe much too lumpy; maybe not. It will depend upon the Fizzion Rule: Does Fizzion divide matter almost equally or not? It strikes me that he isn't being helpful here. But he has given me a notion: Flecks that have less matter may begin to miss a beat. In other words the skinny ones may not Fizzion every Move. Skinny means, of course, not size but matter. This will work to even out the lumps. I think about it this way: If one of the 1,048,576 Flecks that exists after Move 20 has *no* matter it won't Fizzion. It's a corpse without an *obol* to pay Charon for the ferry. It is stuck there on the wrong side of the Styx. It is an empty Fleck that's broke amid a million heavy spenders. Its mark upon the universe is destined to be negligibly small. Of course this is extreme and thus unlikely. What really happens need not be clear-cut. Flecks with lots of mass to spend must multiply more than the poor ones. It's an equalizer. Most Flecks Fizzion every Move but skipping is soon going viral. By Big Flash time it has become what almost every Fleck does almost every Move. The cosmos is expanding quite sedately. It's still slightly lumpy, seeds of galaxies already sown, encoded, not yet written.

A stony silence greets my inspiration. He is either holding out or miffed because he didn't see it. Then right away I realize this isn't all. This does away with the Horizon Problem. It's *not* a problem, never was. Having started out in life as both the smallest and the largest lump conceivable, the universe is soon close to Thermal Equilibrium because it's *made* that way through all the Moves. It happens, not by heat flow that's not fast enough, but—Fleck by multiplying Fleck and lump by smoothing lump—through Fizzion. This is such a dazzling vision that my mind is numb. It's so simple and so complex.

"Now you begin to see."

My impulse is to not think any answer. Cut him dead. But there is no way to do it. It's now pretty clear to me that he knows what I think. Even though I may not want to think them, thoughts think on.