

# THE PROBLEM OF UNDER-DETERMINATION

Now, supposing space to be something in itself, besides the order of the bodies among themselves, it is impossible that there should be a reason why God should have placed them in space after one certain particular manner and not otherwise, ... why everything was not placed in quite a contrary way, for example, by changing East into West.

Gottfried Leibniz (1716)

Was it something that they said?

All the voices in your head....

Laura Branigan (1982)

Even one person can have a sense of dialogue within himself, if the spirit of the dialogue is present.

David Bohm (1996)

One can ... always ask, why is the universe where it is, rather than ten feet to the left, or rotated 30 degrees? Or, why did the universe not start five minutes later? This is sometimes called the problem of under-determination: nothing in the laws of physics answers the question of why the universe is where it is, rather than translated or rotated.

Lee Smolin (2008)

Reading round I find under-determination is an ancient problem. It's simple but not easy to explain. It's *why* the universe is where it is, wherever that may be, though Yau speaks casually of moving the whole universe one foot to the right. And *when* it is, like *this* ten billion years, and not some other one ten trillion years before. It's giddy stuff. I'm swotting up on it when Frank walks in and—

“Is there another Frank?”

It's a voice. It's clear. It's loud. But somehow I don't think it spoke aloud.

“What is he doing here?”

Loud and clear but *Frank* said nothing. Nor did I. The voice was just *there* in my head. Is it *my* ideal Frank? That's how I sometimes think of him. I glance again to see if Frank who's in the room has noticed.

“What's *his* problem?”

How does *my* detective get a voice? Distractedly I wait a while. A thorny plant I came on in a forest near a Queensland beach of which my mind decides to think. Aka the lawyer vine, don't ask me why, but it did make me wait. It seems

the voice has nothing more to say.

Frank stands behind me, looking at my screen. It says: The Problem of Under-Determination. Then quotes from Leibniz, Bohm and Smolin. Plus a half-started paragraph. A tune and then the lyric come to mind. It's Gloria—something about the alias that she's been living under; boldly, but feeling kind of queasy, I type two song-lines above Bohm, then this.

Many versions may be used to pose the problem. Wider versions say we can't know anything. The Smolin version's narrow and not new. His problem is not: Where's the universe? Nor: When did it begin? It's nothing like Frye's local version: Where is here? It's: How come there's no reason why the universe is here and now instead of there and then?

To me this isn't just a problem; it's an argument. It argues a relational by contrast with an absolutist stance on space and time. The questions used to pose the problem assume it makes sense to speak of where and when the universe may be. If not, the answer is another question: Relative to what? There is no answer to this question. The universe *is* everything. There is nothing for it to relate to; it has no location. So these questions are not real. I think for Frank the clue is clear: Look for a relational Beginning, there's no need to worry where or when. It's just a thought; I keep it to myself.

The sun is setting. He is leaving. I am thinking: Still no voice. It minds me for a moment of the voice that drives Crick crazy in a movie. His voice is a character created by a writer in a book. The voice begins when Crick is in his bathroom. He loses it. It's like he can't get hold of where he is. Well, in reality of course *he* is a character; he's in a movie script and so he isn't really in the bathroom. But this is not like that. Here, I'm the writer. I know where I am. I'm in a semi-crappy office in North Hollywood. *This* voice is no one else's character; it must be mine.