

REFLECTIONS

DIMENSIONS

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It was one of those nights when I would have much rather been sleeping, but my mind had other ideas and in the hours before dawn I found myself awake and reluctantly thinking about the number of dimensions through which we move. Eventually I was somewhere around five or six, and creeping even higher than that, which troubled me, because we generally think of ourselves as living in a three-dimensional world, or, if we think relativistically, a four-dimensional one. I am out of my depth in such matters. I am no Newton or an Einstein nor a Heisenberg, nor even a high-school physics teacher. My mathematical education got no farther than trigonometry, and whatever I once knew of trig, its cosines and secants and tangents and what-not, vanished from my mind almost as quickly as it entered it, many decades ago. I can no more handle a quadratic equation than I can walk up the side of a wall (or downward, as the good Transylvanian count has been known to do). So as I lay awake, tossing and turning through the dimensions of my own sleeplessness, I began to doubt the logic of my own philosophizing. My ideas sounded plausible enough to me, at three in the morning. But—six dimensions? Seven? What nonsense was that? Where, I wondered, was I going astray?

I found myself considering the baseball diamond by way of beginning my investigations into dimensions beyond the usual three. The playing field's starting point, by definition—by axiom, in mathematical terms—is home base, or home plate, from which devolve the other bases, placed ninety feet apart at rigorously measured angles. We give those bases the ordinal numbers of first base, second base, and third base. Already we are into problems of enumeration here: the hitter who has knocked the ball into the stands has done it while standing at home plate, and then he must traverse, in strict order, first base, second base, and third base, touching each one, however briefly, and after rounding them he must properly touch the home base too in order to complete the circuit, which means that for the runner home is really both first and fifth base (the starting point, the finishing point). Yet what we actually call first base is somewhere else, ninety feet away, and nobody, of course, ever talks of fifth base.

Let that pass. The essential point here is that all of these bases are in the same flat plane, which we traditionally call the first dimension. The batter, the three outfielders, the four infielders, the pitcher, and the catcher, are all standing upright, so they have height and width, two more dimensions, one being the second and the other the third by customary appellation, though which is which I would not care to discuss right now. (Well, the catcher is actually crouching, but let that pass, too.) The batter hits the ball and runs toward first base, and keeps on going if that is a wise thing to do (and sometimes keeps on going even if it's not so wise); the fielder closest to the ball attempts to catch it and throw it back to the appropriate base before the batter gets there. So the ball is in motion from the moment it encounters the bat to the moment it is caught by the infielder, thus requiring time to get from point A to point B and on to point C. We might consider the elapsed time while the ball is in transit to the fielder and back again as a fourth dimension. Above the whole thing is the umpire, in whom reposes sole authority over deciding whether the ball has reached the base ahead of the running batter, and who is therefore by his decision either safe or out. The umpire, elevated at least metaphorically above the scene by

the authority placed in him, and observing the three-dimensional runner and the three-dimensional outfielder playing out their little struggle against the fourth-dimensional background of time, can be said to be in a fifth dimension, at least by me at this dreary time in the middle of the night.

The process is not done. In the stands sit thousands of avid baseball fans, watching the batter hitting the ball and running as fast as he can to first base and maybe onward, the center fielder scooping it up on two or three bounces and throwing it to the second baseman, and the umpire signaling "safe" or "out" according to his perception of the action as the runner slides into the base. The fans observe the action, too, including the reaction of the umpire, with which they may disagree quite loudly. Are they in a sixth dimension, looking down in godlike fashion as they are from their seats upon the dimensions below them?

More. Even more. Let us say the game is being played in Milwaukee, on a pleasant Sunday afternoon in what used to be our three-dimensional world. The television camera at the ballpark takes in the scene and relays it, not quite instantaneously but close to it (the speed of light, Dr. Einstein insists, is a limiting factor here, and I will not quarrel with him) to viewers watching at home in New York and Los Angeles, or any other city it may be where the game is not currently being played, and, I suppose, to folks at home in Milwaukee as well. Which dimension are those television viewers in? Dare I talk about a seventh? What about the people who watch a replay of some exciting moment from the game two or three hours later, on the evening news? Surely they have to be set aside from the category that includes those who were watching the game at not much more than a few light-seconds after the live action.

We have come a long way from the first swing of the bat and the journey of the batter around those bases. And I, instead of getting a good night's sleep, find myself wandering around the seventh dimension, which I find a very odd idea indeed.

Take another example: let us suppose that a super-doctor has been given the task of traveling completely around the continental United States at something close to the speed of light, providing Covid-19 vaccinations. (For reasons of geographical simplicity we will leave Hawaii and Alaska out of this. They'll have to look after themselves. We will also not get ourselves entangled in the mysterious politics of vaccination and anti-vaccination.) Geographers postulate four primary directions, North, East, South, and West, and, no argument there, we can take those as analogous to our four baseball bases in devising a route for this project. The doctor, let us say, begins in the north, in Minneapolis and points nearby, and when he is finished the job in that region he zips on eastward to Boston and adjacent vicinities, to Dallas and other southerly points, and finally to San Francisco, completing the entire enterprise before the sun has dipped behind the Golden Gate. If we perceive him the same way we see the home-run hitter, he is a three-dimensional object moving across the flat plane of the first dimension and carrying out his job, very briskly indeed. We can also add a brief extension through time, the Einsteinian fourth dimension. Jab, jab, jab—a very active day.

But wait. There's more. There is, I'm afraid, a great deal more. Above him are the busy employees of Pfizer and Moderna and the other corporations that are producing the Covid vaccines all through the day, filling vials as fast as they can to keep ahead of our speedy vaccinator as he whizzes around the Lower Forty-Eight. Can we consider them to be in a fifth dimension? I suppose we can, at least until dawn comes. And one level up from there we find Dr. Fauci and the rest of the medical bureaucrats, creating the rules by which the vaccine is distributed—the umpires of the process, so to speak. Dimension number six? But even then we are not done: so far through the pandemic the cost of producing and distributing the vaccine has been met by our government, which means, I assume, that Congress has had an essential

voice in paying for the stuff that Dr. Fauci et al. make available to the citizenry. Seven? And who elects Congress? Why, it is the citizenry, which could indeed object to the whole business, if it saw fit to do so, by voting the Representatives and Senators who handed them the bill for the vaccine out of office at the first available opportunity. We, the people, sit up here in my dimension eight, therefore, although we obey the rules laid down by the founding fathers of our republic, who—my head is starting to hurt. I toss and turn, yearning to be away in the sleep dimension and not worrying about these things.

Perhaps it's a mistake for me to be looking at baseball or vaccine distribution as problems in topology. Perhaps I am guilty of semantic muddle, and I'd be much better off sticking to good old length, breadth, and width as the only dimensions that really matter, and allowing also for the extension of those three into time as a fourth dimension, period, full stop. But it is some bleak hour in the middle of the night.

I can't help thinking about that umpire, who is watching the runner slide into second base and waving his arms and yelling his safe-or-out decision, and all those other levels of viewers looking down on the action and reacting in their various ways to that decision from their various dimensional locations, even unto the fellow in Pittsburgh or St. Louis shouting back angrily and, indeed, uselessly to his television screen that evening long after the game has ended. I can't stop thinking about my imaginary vaccinator, also, swiftly moving around our glorious land to jab his needle into all those multitudinous arms north, east, south, and west, and as he works wondering about the various levels of authority that of necessity must be stacked above him.

Dimensions? Five of them? Six of them? What am I talking about? An infinity of them, dimensions all the way up? I don't know. I wish I was asleep.

I must be thinking in the wrong categories. But where have I gone astray?

I am no mathematician. I don't even pretend to be a philosopher. I'm just a science fiction writer, and one who is trying to get some sleep. I have no business multiplying dimensions like this. Help me.

Someone. Anyone. Please.