What is science, and how should we use it?

Reading through some old emails, I felt the desire to write a short note declaring once and for all what I feel (right now) about the nature of science, and about the ways we should use science in our lives.

I perceive things. On some days, I care to draw the distinction between "internal" and "external" perceptions, the latter being of the sort that are in some way related to "the outside world". Today I do not feel much like making that distinction: the march of my own thoughts, the song of the birds outside my window... today I will treat these perceptions equally.

For me, science is comprised of efforts to organize these perceptions. Logic is the only tool I know of for organizing anything in life, and it is this notion that establishes a primacy relation among sciences, this notion that explains why, for me, logic and mathematics —the science of (effective) reasoning— are absolutely essential to any other scientific disciplines. This is the only reasonable way I have found of looking at things, but it is very unpopular, because it makes science about human reasoning, rather than "the real world".

Note. A lot of people have fallen in love with the idea that reasoning allows us to discover things about the world. I couldn't disagree more: the only things we come even close to "discovering" about the world are the external perceptions that lead us to reason in the first place, so that our "discovering" is over and done with by the time we start doing science. Honestly I do not care if reasoning does anything or tells us anything; I do it because organizing my perceptions is a pleasant activity, like playing the piano. (End of Note.)

Flipping things around stands things on their heads. (Is that a surprise?!) For example, above I mentioned that in my view of the world, mathematics (say) is a product of our brains. But our brains are physical objects, so establishing a primacy relation according to the hierarchies of "the real world" would mean that somehow physics was essential to the doing of mathematics. Although physics (or any other discipline) can, by being suggestive, be helpful in the doing of mathematics, the idea that physics comes "before" mathematics in any sense of the word is absurd.

So much for the nature of science.

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Now we come to the question of how we should use science in our lives. Hopefully all of my readers have benefitted at some point in their lives from a scientific approach —from the organizing of their perceptions— or from the science done by others, so that at least we can agree that science has something to offer us.

But let us be sober about this notion. If science does not say anything about the world, then at best the fruits of scientific labor are models, models which may be more or less useful in helping us live our lives. It should be clear that the only models worth using are the ones that are helpful. (Genetics, for example, is quite ineffective when it comes

to understanding human behavior, but it is a great model for understanding hereditary traits. And history and epistemology —despite the best intentions and wishes of their devotees— have no uses whatsoever.)

For the most part, people abide by this informal law of hedonism. For example, our physical model of the world keeps us from jumping out of high buildings to save time. But for some reason I cannot understand, people do persist in letting models restrict them, persist in the belief that the world is defined by scientific discoveries. Since science is completely internal, this couldn't be sillier! The idea is as preposterous as the idea that we could become birds just by thinking so.

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I was led to make these observations because my friend has been concerned that the calculational method pioneered by Edsger Dijkstra, Wim Feijen, and Netty van Gasteren, is in some way self-defeating, because of a deadly Godelian loop: we strive for formality, but that striving is informal, and even if we strove to make that striving formal, our stroving would be informal, and so on and so forth through the nonexistent infinite hierarchy of tenses. His readings of Hofstadter's model of consciousness, which embraces Godel's theorems, led him to feel this concern was legitimate.

As I have said, this stands things on their heads. I have been profoundly affected by Hofstadter's model of consciousness; over the last six years or so, it has played a major role in shaping my personal interactions and my understanding of myself. I have used that model in the ways it could help me, and only in those ways. (For example, it helps me to understand why humans act they do, the problems they run into, the patterns of behavior they fall into, how they can solve those problems, break those patterns, etc.)

I too appreciate Godel's theorems, for their mathematical worth, and in some abstract sense I am intrigued by their philosophical consequences. But when it comes to the doing of science, I could care less what Godel has to say, because it cannot help me. Even if I felt his theorems constituted, together with Hofstadter, a model of consciousness that was applicable to the human activity of science —and I don't— , that model would say nothing about how to do science, only about the possible limitations of that activity altogether.

There are useful models when it comes to human reasoning. (See for example EWD619 , by Edsger Dijkstra.) They have led to methodologies like those that underlie calculational mathematics and program construction. These methodologies have been tremendously beneficial to my personal scientific activity. In other words, they are fun.

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Finally, it is worth noting that under this view of science, "intuition" is no more and no less than the *unstructured* organization of our perceptions. Since perceptions and the organization of perceptions are *human*, it should not be surprising that we can do a lot with intuition. But I see no reason to privilege intuition, just as I see no reason to prefer chaos to order.

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