

## 1 Locke

[It would not] carry any imputation of falsehood to our simple ideas, if by the different structure of our organs it were so ordered, that the same object should produce in several men's minds different ideas at the same time ; v.g. if the idea that a violet produced in one man's mind by his eyes were the same that a marigold [souci] produced in another man's, and vice versa. For, since this could never be known, because one man's mind could not pass into another man's body, to perceive what appearances were produced by those organs ; neither the ideas hereby, nor the names, would be at all confounded, or any falsehood be in either. For all things that had the texture of a violet, producing constantly the idea that he called *blue*, and those which had the texture of a marigold, producing constantly the idea which he as constantly called *yellow*, whatever those appearances were in his mind ; he would be able as regularly to distinguish things for his use by those appearances, and understand and signify those distinctions marked by the name *blue* and *yellow*, as if the appearances or ideas in his mind received from those two flowers were exactly the same with the ideas in other men's minds. I am nevertheless very apt to think that the sensible ideas produced by any object in different men's minds, are most commonly very near and undiscernibly alike. For which opinion, I think, there might be many reasons offered : but that being besides my present business, I shall not trouble my reader with them ; but only mind him, that the contrary supposition, if it could be proved, is of little use, either for the improvement of our knowledge, or conveniency of life, and so we need not trouble ourselves to examine it.

Locke, *Essay*, II, 32, § 15.

## 2 Hofstadter

### A Cerulean Sardine

There's an idea in the philosophical literature on consciousness that makes me sea-blue, and that is the so-called "problem of the inverted spectrum". After describing this sacred cow as accurately I can, I shall try to slaughter it as quickly as I can. (It suffers from mad sacred cow disease.)

It all comes from the idea that you are supposedly so different from me that there is no way to cross the gap between our interiorities — no way for you to know what I am like inside, or vice versa. In particular, when you look at a bunch of red roses and I look at the same bunch of red roses, we both externalize what we are seeing by making roughly the same noise ("red roses"), but maybe, for all you know, what *I* am experiencing as redness inside my private, inaccessible cranium is what *you*, if only you could "step inside" my subjectivity for a moment or two, would actually call "blue". (By the way, advocates of the inverted-spectrum riddle would spurn any suggestion that you and I actually *are* already inside each other, even the littlest bit. Their riddle is predicated upon the existence of an

Unbridgeable You–Me Chasm — that is, the absolute inaccessibility by one person of any other person’s interiority. In other words, belief in the inverted spectrum is a close cousin to belief in Cartesian Egos — the idea that we are all disjoint islands and that “you can’t get there from here”.)

## **Bleu Blanc Rouge = Red, White, and Blue**

Let’s consider this idea. Maybe, just maybe, when all fifty million French people look at blood and declare that its color is “rouge”, they are actually experiencing an inner sensation of blueness; in other words, blood looks to them just the way melted blueberry ice cream looks to Americans. And when they gaze up at a beautiful cloudless summer sky and voice the word “bleu”, they are actually having the visual experience of melted raspberry ice cream. *Sacrebleu!* There is a systematic deception being pulled on them, and simultaneously a systematic linguistic coverup is going on, preventing anyone, including themselves, from ever knowing it.

We’d be convinced of this reversal if only we could get inside their skulls and experience colors in their uniquely *bleu-blanc-rouge* way, but alas, we’ll never do that. Nor will they ever see colors in our red-white-and-blue way. And by the way, it’s *not* the case that some wires have been crossed inside those French skulls — their brains look no different from ours, on every scale, from neurotransmitters to neurons to visual cortex. It’s not something fixable by rewiring, or by any other physical operation. It’s just a question of, well, ineffable *feelings*. And what’s worse is that although it’s true, nobody will ever know that it’s true, since nobody can ever flit from one interiority to another — we’re all trapped inside our own cranium.

Now this scenario sounds downright silly, doesn’t it? How could it ever come about that the fifty million people living inside the rather arbitrary frontiers of a certain hexagonally shaped country would all mistakenly take redness for blueness and blueness for redness (though never revealing it linguistically, since they had all been taught to call that blue sensation “red” and that red sensation “blue”)?

Even the most diehard of inverted-spectrum proponents would find this scenario preposterous. And yet it’s just the same as the standard inverted spectrum; it’s simply been promoted to the level of entire cultures, which makes it sound as it should sound — like a naïve fairy tale.

## **Inverting the Sonic Spectrum**

Let’s explore the inverted spectrum a little further by twisting some other knobs. What if all the chirpy high notes on the piano (we do agree they are chirpy, dear reader, don’t we?) sounded very deep and low to, say, Diana Krall (though she always *called* them “high”), and all the deep low notes sounded chirpy and high to her (though she always called them “low”) ? This, too, would be the “inverted spectrum” problem, merely involving a sonic

spectrum instead of the visual one. Now this scenario strikes me as much less plausible than the original one involving colors, and I hope strikes you that way, too. But why would there be any fundamental difference between an auditory inverted spectrum and a visual one?

Well, it's pretty clear that as musical notes sink lower and lower, the individual vibrations constituting them grow more and more perceptible. If you strike the leftmost key on a piano, you will feel very rapid pulsations at the same time as you (sort of) sense what pitch it is. Such a note is so low that we reach the boundary line between hearing it as a unitary *pitch* and hearing it — or rather, feeling it — as a rapid sequence of individual oscillations. The low “note” floats somewhere between singularity and plurality, somewhere between being auditory and being tactile. And if we had a piano that had fifteen or twenty extra keys further to the left (some Bösendorfers have a handful, but this piano would go quite a ways further down than they do), the superlow notes would start to feel even more like vibrations of our skin and bones rather than like pitches of sound. Two neighboring keys, when struck, wouldn't produce distinguishable tones, but just low, gruff rumbles that felt like long, low, claps of thunder or distant explosions, or perhaps cars passing by with subwoofers blasting out their amazing primordial shaking rather than a singable sequence of pitches.

In general, low notes, as they sink ever lower, glide imperceptibly into bodily shakings as opposed to being pitches in a spectrum, whereas high notes, as they grow higher, do not do so. This establishes a simple and obvious objective difference between the two ends of the audible spectrum. For this reason, it is inconceivable that Diana Krall could have an inverted-spectrum experience — that is, could experience what you or I would call a very *high* sound when the lowest piano note is struck. After all, there are no objective bodily shakings produced by a high note!

[...]

## Violets Are Red, Roses Are Blue

Why is it that those who postulate the inverted spectrum always do so only for experiences that lie along a one-dimensional numerical scale? It seems like a great paucity of imagination to limit oneself to swapping red and blue. If you think it's coherent to say to someone else, “Maybe *your* private inner experience of red is the same as *my* private inner experience of blue”, then why would it not be just as coherent to say, “Maybe *your* private inner experience of looking at a red rose is the same as *my* private inner experience of looking at a blue violet”?

What is sacrosanct about the idea of shuffling colors inside a spectrum? Why not shuffle all sorts of experiences arbitrarily? Maybe *your* private inner experience of redness is the same as *my* private inner experience of hearing very low notes on a piano. Or maybe *your* private inner experience of going to a baseball game is the same as *my* private inner experience of going to a football game. Then again, maybe *your* private inner experience

of going to a baseball game is the same as *my* private inner experience of going on a roller-coaster ride. Or maybe it's the same as my private inner experience of wrapping Christmas presents.

I hope that these sound ridiculously incoherent to you, and that you can move step by step backwards from these variations on the inverted-spectrum theme to the original inverted-spectrum riddle without losing the sense of ridiculousness. That would be most gratifying to me, because I see no fundamental difference between the original riddle and the patently silly caricatures of it just offered.

## A Scarlet Sardine

The inverted-spectrum riddle depends on the idea that we are all born with a range of certain “pure experiences” that have no physical basis but that can get attached, as we grow, to certain external stimuli, and thus specific experiences and specific stimuli get married and from then on they are intimately tied together for a lifetime. But these “pure experiences” are supposedly not physical states of the brain. They are, rather, subjective *feelings* that one simply “has”, without there being any physical explanation for them. Your brain state and mine could look as identical as anyone could ever imagine (using ultra-fine-grained brain-scanning devices), but whereas I would be feeling blueness, you would be feeling redness.

The inverted-spectrum fairy tale is a feeble mixture of bravado and timidity. While it boldly denies the physical world's relevance to what we feel inside, it meekly limits itself to a one-dimensional spectrum, and to the electromagnetic one, to boot. The sonic spectrum is too tied to objective physical events like shaking and vibrating for us to imagine it as being inverted, and if one tries to carry the idea beyond the realm of one-dimensional spectra, it becomes far too absurd to give any credence to.

D. Hofstadter, *I Am a Strange Loop*, Basic Books, 2007, p. 333-338.