

A few words on the metaphysics of perceptual control

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I suggest there is a middle ground between absolute ignorance and total certainty about the "real world". In the sense that everything might be a manipulation by an omnipotent being that could at a whim change all the rules, we are completely ignorant. So, if we are to do anything that we might call Science, we have to make all our probabilities based on the assumption that is not the case.

We must assume that there exists stuff out there that behaves consistently, even if we don't now, and probably will never, know the rules of that consistency. I'll call these unknowable stuffs and rules of the Universe "The Rules". But even if we can't know The Rules we can look for ways in which their consistency manifests itself in perception. The Rules need not contain anything like our logic or our objects. Relationships to our language might exist, but they might not. But it doesn't matter.

There are two ways to find out something about "The Rules", and so far as I can see, only two ways. One is to look (feel, hear, taste...) passively at the world we have to assume manifests The Rules, the other is to attempt to control various perceptions by different means, using The Rules. This latter approach leads to reorganization. If some actions, according to The Rules, do not influence a particular perception, while other actions do, we, or rather our bodies, have learned something about The Rules. What our bodies have learned may not be correct, but it is sufficient for us to control to some degree. The more accurate the control, and the longer the time period over which that accuracy is sustained, the more we can be assured that we know those aspects of The Rules involved in controlling that particular perception -- "know" in the sense that our bodies function as though they are true, not in the sense of being able to verbalize and mathematize them.

As is often observed, many different functions of hypothesised environmental variables can correspond to a particular perceptual function. Taking the naive realist position, if a carpenter is carving a chair leg to a particular curve, the wood might be dark or light, tough or soft, and Aldebaran might be in the process of flaring. The quality of the wood does affect the carpenter's actions in control of the curve, but the control process assures that it does not influence the result. The carpenter can perceive that the quality of the wood matters only if he also perceives the forces he is applying, or the sharpness of the blade, or the grain of the wood. Other perceptions matter. And that brings us back to the relationships among perceptions, relationships that are influenced by The Rules.

One really weird thing about The Rules is that they allow the most abstruse mathematics to predict extraordinary relationships among perceptions. Mathematical calculations allow us to construct buildings of complex shapes that don't fall down (most of the time). The most extreme example of this that I can think of is the detection of neutrinos from Supernova SN1987a in one of the Magellanic clouds, that allowed physicists to put an upper limit of 16 electron-volts on the mass of the neutrino because of its timing relation with the electromagnetic signal.

Think of the words I used in that last sentence: "electron-volt", "neutrinos", "Supernova", "Magellanic Cloud", "electromagnetic". None of them corresponds to something one might point to and label to another person (though for "Supernova" there have been times when that might have been possible, and I believe it is possible for Magellanic Cloud in the Southern Hemisphere). All of them depend on huge network of relations among perceptions and perceptual control in the form of laboratory experiments conducted over centuries in many places. And all of this is described and made predictable by a huge mess of interrelated perceptions we call mathematics. The Rules permit this, and that they do is to me the greatest mystery of "out there".

Cartoons are low-detail pictures of a scene that has much complication, highlighting what the cartoonist thinks are the important features of the scene. Similarly, we make cartoon "rules" to represent what we think about The Rules. Our efforts to provide intelligible cartoons that behave usefully like The Rules change over time. At one time "level" may have meant "a surface on which water will move in no preferred direction". After Newton, it might have meant the relationship between two points at the same gravitational potential. After Einstein it means something different, but we still can use the post-Newton cartoon rules for most practical (i.e. effective perceptual control) purposes. Newton might perhaps say there is a true "level" parallel to the Earth's surface in an orbiting spacecraft, but Einstein would not.

Mathematical approximation to The Rules is not how most organisms learn how to use them. For most organisms, control through The Rules has been learned through a combination of evolution and reorganization.

Every organism has perceptual functions, at least some of which produce controllable values, and at least some of which have input values that include effects of The Rules on sensor systems. Likewise, each organism has effectors that act through The Rules. Some of those actions have effects on the values of the perceptual function outputs, effects that occur because of the way the actions interact with The Rules. Actions that consistently permit control of perceptions tend to be retained over evolutionary time, especially if control of those perceptions tends to result in longer life or greater numbers of descendants.

For any organism, those aspects of The Rules that admit consistent control are likely to result in persistent perceptual functions. When such a function produces a significant output, its owner perceives the existence of something in the outer world, such as an object or a relationship or a category. We cannot know whether such a "something" exists within The Rules, or even whether it makes sense to ask such a question, but we perceive it because one of two things is true of The Rules. Either several different perceptions tend to be coordinated (and thus likely to be eventually combined into a "higher level" perception) or the perception is controllable by way of some consistency in The Rules that allow certain actions to have consistent effects on the perception.

Consider the perception of a particular "chair". A "chair" can be seen as a particular consistent relationship among "legs", "seat", "back", "arms". This particular chair may lack some of the elements, but when you control a perception of its location, all of its elements move to maintain the same perceived relationships among themselves and internally within each of them. If one of those relationships changes, as would happen if a leg falls off when you move the chair, the object is perceived as having changed.

Perceiving the "chair" as a solid object is only a cartoon of the relevant parts of The Rules that affect our control of the perceived properties of the chair object. It is a cartoon perfectly adequate for using the chair in the control of many perceptions, but for control of others, it is not adequate. The many controlled perceptions that eventually result in a picture of the "chair" as a complicated cellular structure provide a more refined cartoon, and an even more refined series of cartoons come from the control of other perceptions related to atomic and quantum (mathematical) operations. In centuries to come, other refinements of the cartoon may be developed, but none of them will alter the value of the cartoon that treats the chair as a solid object on which one can sit.

It may well be that "The Rules" contain no objects, cells, or probability amplitudes. We cannot know whether they do or don't. What we can know is that by assuming that they do, we can control many more perceptions than otherwise. As little as one century ago, it would have been possible to create a supercomputer, in the same way that an infinite number of monkeys on typewriters would inevitably write an infinite number of copies of all of Shakespeare's plays. But the perception "supercomputer" could not have existed at that time.

To create a new perception "supercomputer" requires that in at least some people other perceptions exist, such as "silicon chip", "transistor", "logic cell", "quantum tunnelling" that did not exist 100 years ago, as well as some that did exist at the time, such as "voltage", "current", "resistance", "capacitance", which themselves had not existed a couple of hundred years earlier. Just as Newton "stood on the shoulders of giants", so our perceptions stand on the shoulders of other perceptions. If our "supercomputer" is to work, those perceptions must not be too untrue to The Rules. Our cartoons become ever more refined, so that we can perceive the relationships that allow us to detect and to understand (within our current cartoon) the "core collapse neutrinos" from Supernova 1987A.

At heart, it all depends on effective perceptual control. If control works, we are more likely to retain a perceptual function than if we cannot control its perception. If we can control it, it is likely to have some correspondence in The Rules, no matter how crude and unlike the actual Rules that correspondence might be.

The Rules seem to permit the existence of organisms other than ourselves. Other living things affect what we perceive as their surroundings and thereby sometimes affect our ability to control some of our perceptions. We do not (usually) perceive these changes to be alterations in The Rules, as within our cartoon of "The Rules" there exist animate objects. Indeed, when things change or our actions to control

our perceptions do not work in the customary way, we often impute animation to the object. A few millennia ago everything was thought to have its own spirit. Over time, as we learned how to control more perceptions, the perception of spirit in every object changed to a perception of invisible dominant beings called Gods and Goddesses that could manipulate objects.

In my undergraduate engineering, we used to talk about "The Law of Aepolio", which concerned "the innate perversity of inanimate objects" but was not otherwise codified. The Law of Aepolio was a joke, but a serious one. As we produce refined cartoons of The Rules in the form of Laws of Nature, using which we are able to control ever more perceptions, the domain of interference from invisible animate entities diminishes, along with the domain of Law of Aepolio.

None of this suggests that we will ever be any closer to The Rules as they actually are than we were a thousand or a million years ago. But within The Rules as they actually are we are able to control a lot better than we used to be. So we might as well act as though our ever-more refined cartoons of The Rules are true, until something happens to suggest that the current approximation can be improved by rejecting something we used to take as part of the cartoon. In everyday language, new data can lead us to modify our beliefs.

The upshot of all this is that because certain perceptions tend to go along with each other rather consistently, we can often control one when the means of controlling the other are less readily available. When we use a spirit level to find where to place the mounting for a shelf, it is not because we want to control the perception of a bubble in a tube, but because when we do control the perception of a bubble in a tube, we are not later going to see things slide off the shelf we have mounted, or because we hope that the shelf will look parallel to a floor or ceiling. The Rules have been consistent for long enough that the perception of "level" can be used both for the spirit level bubble and for the shelf, even though the appearances of the two (presumed to exist) objects are quite different.

In that sense, abstractions such as "electron volt", "level", "probability amplitude", "soft", exist in the cartoon world with which we approximate The Rules. So long as they work for controlling the perceptions we want to control, so long will it be appropriate to treat them as having a real existence outside ourselves.

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