Scanning, tubes, light, touch

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1 Two stances with respect to seeing

This excursion into text begins with the understanding that there are two ways to think of seeing with respect to the human head: to look for a represented world within,[1] or a world in which the head (and body) are contained and move.[2] The topology of the body does not force one view or the other on us. We can call these the internalist, and the relational stance, respectively.

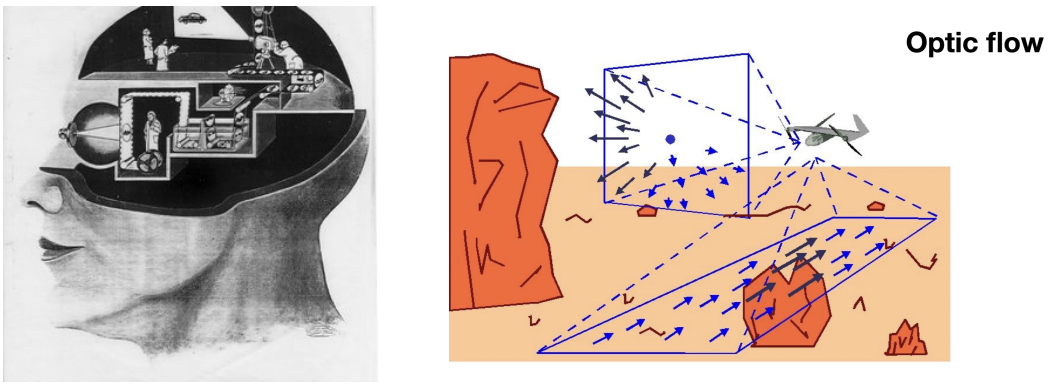

Figure 1: *Two stances: Left: internal, representational; Right: relational;*

We will consider both stances, and their tacit assumptions about the body and the brain. First we consider the body, and then the brain.

2 The topology of the body

The topology of the body is approached phenomenologically. The reader is encouraged to follow along with some degree of willingness for confusion and paradox.

I consider my body: I cannot see all of my body. I can see well only below chest height—nose wings and glasses frames excluded; these seem to float; they are not anchored. Of what I can see, my body has 4 clear protuberances, two arms and two legs, and a fifth that I cannot see directly. The fifth is the head. To see my head as I can see, and validate, and directly perceive, my limbs would require that favourite trope of the dreamer: an out of body experience. (I can see your head

[1] David Marr's constructive notion of computational vision may illustrate this approach.

[2] Gibson's original obserervations were conducted in consideration of the head of the pilot of a plane moving above the ground.

if you are here. We do not typically think of this as problematical. The trouble maker here is the word 'experience,' which cannot and will not be reified in these words.) It is not possible to directly visualise or model such topological embedding of the body in 'the world.' It is possible to think with it. We are reminded of the figure of the Klein bottle which cannot be represented sculpturally, but can be thought of in 4-dimensional space, which makes the business of insides and outsides rather different from their quotidian uses in the kitchen (pots, etc.).

Figure 2: *Left: Klein bottle topology; Middle: A closed and highly socially constructed body; Right: The five pointed body without assumptions of social construction (pants excepted).*

3 On the retinal image

I have heard that Johannes Kepler is the figure to whom we owe a great deal of how we understand our situtation on Earth and with respect to the solar system. Curiously, I have also heard that he is the figure who informed us that there might be an image on the retina.

Images are the play of light and have ontological purchase only if they are being observed. We will not, in this text, regard images as if they were physical things. A painted picture may throw a shadow, be burnt, and painted over. An image can be found everywhere light plays, if there is an observer. Climb into a tree and observe the patterning of millions of images as the leaves create ephemeral pinhole cameras. Dappling of leaves in the sunlight is the play of light. You have to work hard to recognize that there is the potential for an observer to see such play as 'images.' Get down on your knees in the morning and look in a dew drop. You can also make out an image. Images share the ephemeral quality of the observer themselves, who stands up from peering into a drop and goes for a cup of coffee, no longer the witness of the image.

Kepler, I believe, sourced sheep eyeballs in the course of his inquiry. I would love to witness him arranging the eyeballs, projective means, and observation tools to find an image on the retina. We can understand his approach, for we typically understand light and seeing in this manner. Figure 3 provides a simplified illustration of the eye, retinal image and brain, omitting the complexities that necessarily arise for such approaches in consideration of two eyes and a single brain.[3]

Note also the curious way language is used to divide up the continuum of the body. In this simplistic frame, the retina is considered as an appendix of the brain, and not as part of the photosensitive responsive whole body. As far as I know, the retina and the brain are both labels (linguistic distinctions) used to divide up the integral whole of the nervous system, which is itself

[3]For amusement, the reader is encouraged to consider the anaesthisized cats used in the famous experiments of Hubel and Wiesel, which show the lengths to which one must immobilize the subject and place them in a grotesque position in order to conduct such an inquiry.

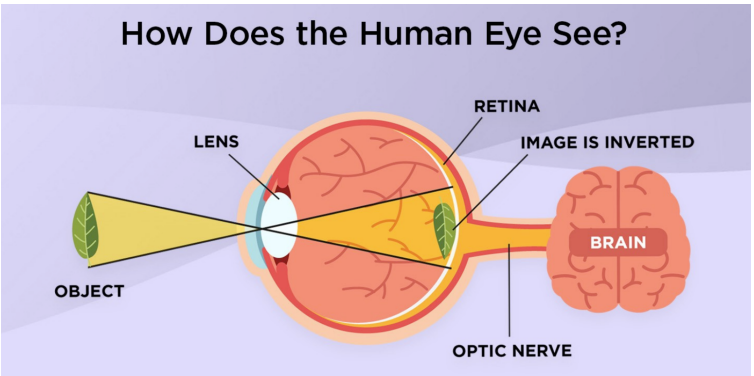

Figure 3: *Simplified diagram illustrating imagistic understanding of vision.*

completely integrated into the whole body. Put baldly, the imagistic approach requires the division, by fiat, of the nervous system into retina (for reception of image) and brain (the presumed locus of subjectivity).

4 On the retina, 2

Gibson's approach also considers the retina, as these researchers have a great belief in the importance of their own eyes in seeing. Instead of looking for images there, Gibson recognizes that there is change on the retina that is of great importance. Technical terms like 'optic flow' are introduced to encourage this form of thinking.

Where the internalist approach sought to support the constructive fiction of a personal 'I' inside the head, the relational approach ignores insides, to look instead at processes of change. This does not resolve the topological issue.[4] Psychologists (and Gibson called his approach 'psychology') are always looking for their singular selves. It is curious that the Gibsonian literature speaks of an animal subject. Gibsonians don't extend psychology to the banker, who, to be fair, is very definitely socially constructed.

Both approaches to seeing understand the body to be importantly photosensitive. Starfish distribute their eyes all over their body. Barbie pays attention, when the teacher scolds her.

5 Living with the undecidability

I exist in this undecidedness between insides and outsides, and yet it is not a problem. It is, I think, possible to believe that you acquire information through your mobile phone (as an internalist 'I' would insist) and to see the thing in your hand as a black mirror that you point at the void that is your head (phenomenological realism).

Now we need to consider the tubes through which the domain of space appears accessible, and through which the microscopic world of infinite complexity comes into view. The macroscope and the microscope, as far as Patrick is concerned, but the telescope and the microscope to Barbie.

[4]The topological issue arose in the Cambrian explosion, when radially symmetric bodies (Patrick) were overtaken by bilaterally symmetric bodies. At this point, vision and predation/running away came into being. This is a long story.

"Outer Space" and whatever the other is called are imaginary domains, or transcendentals, if you will (or have you been the size and consistency and nature of an earthworm, or have you gone to Jupiter? Jupiter is in Outer Space. Where is the earthworm?).

Some learned clerics refused to look through Galileo's telescope. Galileo insisted that seeing would be enough to believe. Galileo contributed to our position. Peering through tubes at the start of scientific modernity transformed our imagination, and in particular, our imagined relation to the earth and the heavens above, but tubes are just tubes. Our fundamental position is not altered by these particular tubes, which rely on the notion of seeing as internalist, of a well defined seeing subject.[5]

We have other gadgets with which we stare hard. It is hard to say where the earthworm is, or what the domain is in which it comes into being. Aiming your gaze down is not at all like aiming your gaze upwards. We peer at what we describe as ever smaller scales (though our body does not change its size) and we ultimately reach a limit. That limit is the limit of optical imagery. But we stare harder, beyond the limitations of optics, with the electron scanning microscope. This is not optical imagery. It is the texture of the void as far as we can see. It arises from touch, not from a camera.

Where is the electron scanning telescope? Oh, it could be built (with infinite resources and omnipotence). Let us take a rock from the neighbouing planet of Mars. We could stare from Earth until we could resolve an individual stone, and we could stare even harder at that. But this is fantasy, because the presumed technologies of staring do not exist. We just care more about our feet on the ground and the mud on our feet than the dry sand on Mars.

6 Brains and all that

Another thing we care about is brains. One in each head. To stare hard at brains we invented scanners, which objectify the brain in the head, and, in the fMRI variant, produce images of changes in blood flow within the cranial vault. Tubes showed us the optical limits of staring, but we stare very very hard. Physicists made an image of the sun by collecting neutrinos in a deep underground vault (Fig. 4). The neutrinos had passed through the earth, and so the earth itself was the lens for this staring. Physicists stare very hard indeed. Have you felt observed, or seen, when walking through the scanner in the airport?

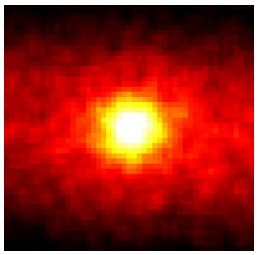

Figure 4: The sun, seen through the earth.

[5]The old adage "As above, so below" requires a middle position to make sense.

7 Response to Finn's writing on consciousness

Finn the Druid has produced a clear, well-ordered treatment of consciousness that engages with many of the fashionable ways of thinking current in cognitive science. We find the so-called 'hard problem', the predictive brain, and even the necessary link between goal-directed action and information. We also find a passing reference to inter-subjectivity, which raises a rather large point: we are not individuals. In bending over backwards to talk to the scientists in their own language, the root issue of monadic being is elided, leaving the happy and self-serving presumption of personal experience, mind, and 'I' untouched.

The text so produced is more of a Gibsonian flavour than an internalist one, in that it does not pander to an imagistic narcissistic psychology, but treats the system organismically, or systemically. In the druid's ontology there is no way to differentiate between organism and system, because the druid only seems to know physics and information theory, but not the challenges of biology, or ecology/symbiosis. In speaking to the cognitive scientists in their own language, all current gross errors are untouched, the brain is untouched in its role as the new religious object enforcing the tragedy of individualism, and the 'knon,' if sought, would be sought for the wrong reasons, and immediately monetized. I don't think this bothers the druid, but the BallyBrack approach seeks to intervene differently.