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Painting By Numbers

Virtually Real

“One ought to know that on the one hand pleasure, joy, laughter, and games, and on the other grief, sorrow, discontent and dissatisfaction arise only from the brain. It is especially by it that we think, comprehend, distinguish the ugly from the beautiful, the bad from the good, the agreeable from the disagreeable...”

– Hippocrates

Reality, Appearance, and Perception

The world around us and our perception of it appear to take place at the same time. There is a real difference, however, between the world we are experiencing and the world that really is. To begin with, it all happened some time ago. It takes two hundred quadrillionths of a second for a rhodopsin molecule in the retina to swivel in place when it is impacted by a single photon of light. This momentary structural change initiates a series of interconnected events which eventually result in our sense of sight. This is where it all starts.

The photon is traveling, naturally, at the speed of light - but once it hits the rhodopsin, things start bogging down at the very first quadrillionth. Who knows, in other words, what's happened out there between the time the photon hits and the time we even start the process of seeing it? In some subatomic worlds, a lot can happen in two hundred quads. What this means is that, at any given moment, we are experiencing a world which is behind real time.

Returning to the eye, the signal now drops down through three layers of retinal cells like a Japanese pachinko game, hops aboard

any of eight million optical nerve fibers, does a criss-cross through the lateral geniculate nucleus at the top of the brain, and arrives at the visual cortex as meaningless as an upside down Picasso. This means a further ride around the hippocampus to identify the image and assign levels of meaning and association.

Finally it clicks into consciousness. It's at least a tenth of a second later, and we finally see it, but the real world has already moved on. When any iPad can send a signal from Boston to Chicago and back in a millisecond, the time it takes us to see anything is a pretty slow train. After all, the entire universe expanded in a few seconds; humans are pretty slow at the picture show. Even worse, any image must mean something slightly different to each viewer. All our senses work the same way.

As a result of this necessary bucket brigade as the signals travel from one place to another, the world we experience is slightly behind "real time", it is a separately assembled and replayed version of a world that actually took place at some other time. In fact, any reality we perceive can only be such a representation, a replicated perception fashioned on the fly in our brain to which we react and relate as if it were real. It's our own "virtual reality." It can't be real, but we think it is.

This moment-to-moment process is seamless because we can't perceive the synthesis of perception. Moreover, the illusion is shared by all others. Since we share the same DNA and operate in the same manner, we seem to be sharing the world. In fact, we are all actually experiencing our personal show in our own cranial planetarium, and we never notice it. Even if we could, we could not change it and there would be no reason to do so. Still, as all our perceptions must be fashioned from a pattern of pulses traveling through neuronal networks, any reality we can perceive must occur subject to any number of limitations peculiar to our biological systems, just as a computer-generated virtual reality operates within the rule structures of its specific software

recently evolved capability. If we could neither read nor project very well, we might not even think about what happens after death and it may be too late. In fact it seems highly likely that most, if not all, of those last questions regarding religious services may have been nearly impossible to comprehend as little as 100,000 years ago. Recent discoveries indicate that the ability to represent time, generate abstract thought, and speak voluminously all require brain structures evolved within a relatively recent evolutionary time frame. The earliest humans with brains like ours, for instance, didn't appear until about 200,000 B.C. And we may have been the last of a million years without any communication beyond a grunt. Nobody's used a word.

When it comes to the ability to understand food's components, or even speak with fluency, we needed a well-developed speech system. Clearly, any fetus had to appear at least just this good to be considered a fetus, without many recently-evolved neurological capabilities, we would not have had the consciousness to have either learned how to drive a car, and even if we did, we certainly could not have written about it, read about it, or even spoken about it to anyone else. To be an early modern hominid, therefore, we were born, not one in more than 1,000 years old, already a rather recent phenomenon, just as we understand it.

Everything in 1,400 cc's

When it comes to higher forms of life, consciousness is usually characterized by the relative sophistication of perception, the ability to extract information from the environment, and cognition, the manner in which that information triggers a useful reaction. Limiting either limits our experience. Without perception we would have nothing to react to, and unless it were for some purpose, we would have no reason to react. When the manipulation of perception and memory to some useful end includes the use of abstract thought and projection, we call it reasoning. It is the higher levels of reasoning and perception that we call intelligence.

When it comes to judging the consciousness of another creature it is useful to remember these variables. The honeybee, for instance, perceives and is conscious of ultraviolet light. It can see colors we cannot imagine or know in any way. On the other hand, a bee's tiny "brain" is too limited for any cognitive processing. It cannot adapt or decide anything consciously. It cannot reason at

all. Moreover, its minimal insect consciousness must act through a nervous system of great simplicity and efficiency, and the bee is further limited by this simplicity. Insects are practically hard-wired, entirely pre-programmed. If a bee heading in a bee line meets a breeze, increased air pressure on one side of its body automatically energizes a muscle linkage that angles the beating wings, like helicopter rotors, to compensate for the sideways drift. The bee doesn't know it happened. Moreover, its multi-lens eye can't focus, so it nearly runs into flowers.

Returning with nectar or pollen, the bee dances directions to the flowers, turning in patterns on the hive wall as the other bees brush up to get the latest travel reports. It would be nice to imagine that bees are scrupulously honest insects, since not once has a bad bee knowingly passed on false information. In fact, they can't. It's the playback of the flight recorder operating the bee, turning the insect into a dancing marionette mindlessly miming something it can never understand. Aside from lacking alternatives, insect brains have little internal redundancy because insects wear out before they need replacement parts. Four generations of honey bees live and die during the time it takes one human brain to mature - four years during which our unique human consciousness acquires complexities and capabilities we will never fully understand.

To know the soul, it must be perceived by a human consciousness for examination and reflection. For love to guide us, we must be conscious and aware of love. If we are unaware of ourselves or others, we are called thoughtless. When we act without the awareness available to us, we are not being mindful. It is our consciousness alone that makes the universe known to us; and our consciousness is made known to us only through the moment to moment functioning of our living brain.

Within the space of roughly fourteen hundred cubic centimeters moves the exquisite organic instrument which determines our entire awareness of anything else at all. Damage it or stress it and we are no longer aware of anything in the same manner. Our universe will change around us. We may have a change of heart, we can change our minds, and the brain will accommodate our shifting realities without a missing a beat. But if we tamper with any basic function of the brain, we can distort or destroy the perception, realization, and projection of our entire consciousness for some time, possibly for all time. Our world, as we know it, is in our hands. More precisely, it is in our heads.

It is here where the paradox of a physical brain and a non-

physical mind, spirit, or soul may at least be partially resolved. Whether our consciousness, with which we perceive everything else, is created by the brain, or simply perceived by the brain, it still can only be as we perceive it. We perceive all of it through the structure and the function of the most complex and intricately arranged form of living matter we could know or imagine. It must function at a level beyond description since it must be complex enough to let us perceive anything we can describe or feel, as well as regulate and operate everything else at the same time. It is as close to the infinite as we can get close to, and it is not out there. It is in us, a part of us that makes us who we are and what we are, and it is alive and well or you wouldn't be reading this.

It makes for us the only world we know, a physical activity that lets us perceive our days, our nights, our dreams, our faith, our beliefs, and any other thing we can perceive at all. Whenever we use our mind to search for meaning, we will find it wherever we look the hardest, and we will always find it to be made of whatever we believe in the most. If we sense that the universe is in a constant state of creation and change, it may be because we perceive it with a living mind, born of a living brain, itself in a constant state of creation and change, a daily ongoing enterprise of billions of minute living cells.