ONTOLOGY FROM TECHNOLOGY

The current revolution in the communications/computing industry through its essential technological parameters is making manifest some basic ontological properties of the world. Analog/digital, FDSMA (Frequency Division Multiple Access), TDMA (Time Division), SDMA (Space Division), CDMA (Code Division), etc. all involve the dimensions by which we experience reality. This new technical parametrization affords an opportunity to explore, at least metaphorically, the ontological nature of the physical world.

For example, we observe the world to be fractally structured, with modules of energy-matter being separated by gaps, voids, and silences. From technological analogies, we may reason that gaps are the result of wave interference. Two conclusions may be draw: 1) That the ultimate structure of the universe is wave-like. Underlying atoms, nucleons, quarks…, are primary energy waves of multitudinous frequencies and wave lengths and 2) in an infinite space all waves may coexist with noise like cancellations and reinforcements but in a finite domain only integral waves may exist, all other cancel each other out. The presence of gaps between integral values therefore infers that the universe is finite. While this might be erroneous, if nature uses the same structures universally that we observe in our technologies, and employs economy in the number of forms, then the likelihood of such reasoning being correct is large.

Many of the technological parameters are paired, possessing various types of symmetries. Time and frequency are reciprocals, T*f=1, but we experience time as continuous and frequencies as discrete. Time is in a continuum, it is like the real numbers, it is measured. Frequency is in a discretum, it is like the integers, it is counted. Ourselves, we experience temporarily the waves of frequency less than one hertz, and experience as frequency the waves of frequency greater than one hertz. But the world is experienceable at many different frequencies. We perceive different realities when our theta and alpha waves change frequency. The differences greatly exceed changes of the order of viewing the landscape through different colored lenses. But the world can also be viewed in multiplexed time. Events are imbedded in a discretum—Camelot, the once and future king. But multiplexed events lack the reality for us that the continuous conveys.

We select our physical reality with our senses. The notations of time and frequency come to us primarily aurally. (Although there is also an inertial sensing of time and frequency in every body cell). Our notions of space come to us primarily visually, and since we are dominantly visual and aural creatures, space and time have become the important infrastructures in our organization of experience. (Other animals may have infrastructures in smell and taste as elaborate as our space and time, or even in some sense area we hardly possess. I am always impressed by the way flocks of birds and schools of fish can maneuver in coordination).

What about space? Again, we encounter gaps and voids. There seems to be the need to measure both extension and separation. Are these measurable with the same meter stick? The

reciprocal of distance is sometimes expressed as curvature. D*K=1. This is not so intuitive for us as the idea of wavelength.

Fundamentally we encounter matter and gaps, sound and silence, stuff and no-stuff. Within the stuff is continuity, between the stuffs is discreteness. Thus, there is both an analog and a digital aspect to the world, leading to its fractal like structure. Certain kinds of gaps lead to levels and hierarchies, others to cells and cellular aggregates. Then there is the important wave-particle dyad. Wave are everywhere and everywhen, particles are here and now. The problem for the ontologist is to organize all of the dyads and symmetries.

Time and frequency are paired $T * f = 1$
But also time and energy are paired as a position & momentum $T * E = action$
$E = ML\text{^}2/T\text{^}2$
$E * T = ML\text{^}2/T$ = action

Dyads

Continuous and discrete, (analog and digital)
Wave and particle, (global and local)
Time and frequency
Extension and separation
Distance and curvature
Channeled and open (4π) (wired and wireless)
Signal and noise
Mobile and static
Node and link