<u>**A Window to the Past**</u>

1. A form of frequency superior to that of electromagnetic radiation may exist; mediated not by the photon, but preserved by the gluon. Where as electromagnetic frequency could be thought of as '*bipedal*' having a crest and trough, the frequency maintained by a gluon could be thought of as *'tripedal'* in the case of 3 quarks constituting a proton. Quarks are not stationary relative to each other in a hadron - the attraction/repulsion between quarks as a result of their 'color' charge is dynamic. The quarks could be thought of as behaving as if held together by an elastic band, with that band being the gluon. Due to the 'tripedal' nature of a proton's quarks' frequency, a near infinite number of unique orientations in how the quarks move together exist.

2(a). External forces influencing the quarks can only add to the *'tripedal'* frequency shared between them; it can't erase or reset it. The reason for this is that a change in one of the quark's velocity adds to the entropy in the orientation between the quarks (it can't *take away or reset* entropy) with the change in velocity being in an infinite number of possible directions, with a magnitude which has infinite possible values. It can therefore be hypothesized that the frequency between quarks has an immense, near-infinite capacity for holding information.

2(b). Despite the frequency between quarks having a near-infinite capacity for information, whether that information can be retrieved off it and transmitted meaningfully is another question entirely. It is here where our thought experiment in physics now moves on to a different subject: *computer engineering* (processor microarchitecture in particular) and *nanotechnology*. Modern processors consist of single-electron transistors - with some of the latest transistors in development being just 1-3 atoms thin; meaning, the advancement of the technology is at a milestone barrier between the atomic and subatomic scales, with components made up of their smallest possible constituents - smallest possible at least for the time being, until maybe there is some great breakthrough in the future allowing for the use of even smaller components (whatever those might be). So, harnessing the frequency shared between quarks in an individual proton is something that could be realistically accomplished with the scale of technology *right now.*

4. The first challenge is integrating this hypothetical 'tripedal frequency' (which involves Quantum Chromodynamics (QCD)), with the microarchitecture of a processor-- a means has to be identified for how to work with our 'tripedal quark frequency' using electrons. With electrons as an intermediary, we can seamlessly cross over into modern processor microarchitecture with electron-transistors and transcribe the frequency with computer algorithms.

5(a). Anti-matter is the secret ingredient. One method that could be proposed for trying to measure the frequency between quarks would be to fire positrons at a desired proton, since the positive electromagnetic charge of both would allow for the positron to sort of 'ricochet' off the two +2/3 charge Up-quarks of the proton via electromagnetic repulsion, we could then measure the differences between positrons fired at the proton, and begin deducing the frequency shared between the quarks. This would perhaps work simply as an experiment for proving the existence of the hypothetical 'tripedal frequency' between quarks, but would fail to integrate it with computers for working with it meaningfully.

5(b). Vibrations are preserved through change in mediums. We now need to refresh our conception of the fundamental behavior of frequency, waves, and 'vibrations'. Perhaps the first example in history of analog frequency being used by a device to transmit information was the invention of the phonograph. The phonograph transmits analog frequency across changing mediums, with the analog frequency preserved despite the change in medium. When recording a record, first a microphone (which consists of just a coil and a magnet) converts the vibrations from sound in the air into the frequency of electricity down a wire; the frequency is preserved in the electricity of the wire. Then, it is converted back into a kinetic vibration again through a speaker (which again consists of only a magnet and a coil)attached to a needle, which etches the sound into the vinyl or ceramic record; the 'vibration' in the needle is literally the music or sound that will be heard on the record. If you were to hold the needle in your fingertips, you would be able to feel the rhythm of the music vibrating in it, perhaps slightly even being able to make out a little bit of melody. The frequency was preserved as it transferred onto the needle, and the frequency was preserved yet again after the needle etched it into the vinyl/ceramic record. Nothing exceptionally complex or advanced is involved with having the needle etch music into the record, it simply 'transfers' onto it. Primitive variations of the phonograph are possible which are entirely mechanical; indeed, a simple toothpick paper-cone apparatus can be dragged along the grooves of a record to faintly hear the music on it - but it is important to point out that phonographs which use electricity 'preserve vibration and frequency', even when that vibration, which was originally soundwaves in the air, is sent down a wire by electricity. A basic phonograph using electricity is still extremely simple in design; there are no extra mechanics, special doohickeys, or fixes/tweaks involved with converting the frequency in a wire back into sound/vibration - for a simple design, that is: just a coil and a magnet basically. Of course the kids these days expect additional bonus features like fast forwarding, track skipping, equalizers, and a bass boost thrown in, but no extra doodads such as those are *required* for a basic phonograph to work.

5(c). Entanglement - 'Vibration' and frequency preserved between subatomic particles as a medium. Now we arrive at some very significant 'what ifs' and assumptions being made, but resting on the principle that frequency transfers between mediums with ease, and that frequency and vibrations will simply 'transfer on to' something by contact/proximity, as part of the fundamental nature of frequency and vibrations. Either it simply works or it simply doesn't. Returning to the hypothetical 'tripedal frequency' shared between quarks in a hadron, we might assume that when held in proximity to each other, two hadrons (lets say in this instance, two protons) would have some of their tripedal frequency 'rub off' onto each other, as the field from each quark and its charge in each proton, when forced into close proximity, would begin to align with the quarks in the other proton. Also, the 'tripedal frequency' of the quarks could be assumed to also be expressed slightly in the electron(s) around a proton, as the combined charge of the quarks is ultimately what attracts the electron, thus the electron's path in space must be influenced, to some extent, by the quarks in the proton directly. We might assume a rule of thumb that the quark's frequency is more effectively preserved the less subatomic particles it must travel across.

6 (a). Drawing the Blueprints. Ideally, measuring/'reading' the frequency between the quarks would be done most efficiently through contact between a hadron and a lepton; earlier I mentioned a positron, although most desirable would be an electron, which we can then transition onto a processor with no extra steps inbetween. Using an anti-proton held in a housing unit attached to the processor, an electron could be fired at the antiproton, to interact directly with negative charge of the -2/3 quarks in the antiproton, repulsing the electron back down the corridor it came from. Then, with open gates lining the sides of corridor, the electron's trajectory (which was changed by the quarks of the anti-proton) will have veered to the side resulting in the electron entering an open gate. Through the gate, the electron switches a transistor, allowing the processor to identify which gate it entered. The processor then begins making deductions about the anti-proton's frequency based on which gates the fired electrons are entering when returning from the anti-proton. At first glance this would seem arduous and ineffective, but electrons would be sent at the anti-proton hundreds of thousands / millions of times per second.

6(b). So, now we have a hadron integrated with a computer, but how do we do something meaningful with it? As it is, this apparatus will not tell us the tripedal frequency of the antiproton with any fair degree of precision; being constantly pummeled by electrons fired at it will change the quark's frequency faster than it can be read, and the only thing the computer will deduce is that the anti-proton seems to have recently had a barrage of electrons fired at it. The frequency between the anti-proton's quarks has to be continuously aligned to a different hadron held elsewhere, and the tripedal frequency of that hadron is what's being measured. Outside the anti-proton's housing unit, a specific form of electromagnetic radiation (something along the lines of a neutral, evenly distributed, 'white light') is shone at a proton or group of protons mounted in front of the housing unit of the anti-proton. The proton(s) leave an impression in the light, which then hits the exterior of the housing unit and transfers on to the anti-proton. With a continuous stream, the anti-proton's quark frequency will align itself to that of the proton(s) outside the housing unit.

7. Applications. Depending on the actual capacity for information of quarks' 'tripedal frequency', the applications could be astounding - what has often been deemed 'new physics' - or it may only ever serve an ambiguous, quirky, potential role in hypothetical computations. If the depth of what hadrons are capable of in terms of their frequency is something we have only begun to tap into (which is what I'm sure the majority of the physics and greater scientific community would hope for), then the information stored on quarks might possibly give us access to things previously considered 'science fiction'; imagine running a piece of old film through this computer, and being able to see what was *behind* the camera while filming - just from measuring subtleties in the frequency of the quarks still persisting after the initial chemical reaction which produced the image on the master copy of the film. If applications are perhaps less fantastical

than that but still profound, one possible application would be to determine the directional origin of a particle by measuring its relativistic entropy; ions from space colliding with Earth's upper atmosphere could be briefly captured and have their origin determine: Did it come from or near the Sun? From outside the solar system? Has it been stuck for a long time in Earth's magnetic field? The frequency between quarks could contain a particle's entire history, carried with it like a fingerprint.

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