

# Appendix 7

## Tensora

Tensora are exotic molecules that produce force and light upon decay. They are biologically produced by an organ called the tensory, which uses particle acceleration to change the state of subatomic particles of hydrogen. When tensora exit the tensory, they remain stable while contained by the nelines of the body, but deteriorate back into hydrogen rapidly when metabolized.

## Tensory

An organ adjacent to the nacore, the tensory, draws H<sub>2</sub> from the nacore and shunts it into one of many 'drivers' which are toroidal arrays of carbon nanocoils capable of circular particle acceleration at relativistic speeds. A thick repository of mineralized tissue surrounding each driver acts as a layered wall that intercepts escaping matter: the 'outer wall' has high palladium content with filaments looping back to the nacore, causing it to catch H<sub>2</sub> molecules and cycle them back for reabsorption, while the 'inner wall' of aerogel dampens the momentum of escaping protium, giving it a high probability of recombining into H<sub>2</sub> before it passes into the outer wall. Once a sufficient quantity of H<sub>2</sub> is captured by a driver, the driver reaches 'saturation' and initiates 'spin up' which rapidly accelerates the rotational velocity of captured H<sub>2</sub> molecules, which are soon broken apart by the momentum. This eventually condenses into a rapidly-rotating ring of protium pressed into a nearly perfect two-dimensional circle. When momentum reaches 'critical' the protium spaghetti-fies into 'particle precursor' which is a monomolecular filament of protons that has become dense enough to trigger spontaneous interactions between their constituent quarks; imprecisely, it begins to act analogous to quark-gluon plasma surrounded by a tubular shell of orbiting electrons. Magnetic perturbations from carbon nanobuds in the mineralized tissue of the walls surrounding the driver then periodically twist the shape of the electron shell, causing individual electrons to occasionally pass through the particle precursor and collide with quarks.

## Tensons

Collisions between electrons and quarks under critical saturation in tensory drivers produces a unique result: mass/energy is transferred from the electron to the quark, the electron is grounded, and the quark experiences a change to its intrinsic spin, which is not observed elsewhere in nature. This fundamentally alters the particle categorization from fermions, which are defined by their half-odd-integer spin, to tensons, which are defined by a natural-logarithmic-integer spin. With most of their mass/energy transferred and their electric charge gone, the electrons become electron neutrinos and are ejected from the body. Up quarks become 'hava tensons' denoted as 'h<sub>v</sub>' while down quarks become 'oira tensons' denoted as 'o<sub>i</sub>' respectively. As it falls between the spin of fermionic particles,  $\frac{1}{2}$ , and the spin of gauge bosons, 1, the interactions between tensons and

other elementary particles are unusual, but as they retain the same charges as their quark counterparts, they recombine into relatively stable tensorons, which are proton analogues comprised of tensons instead of quarks. When tensorons capture electrons, they become macroscopically indistinguishable from protium, freely forming molecular bonds and becoming tensora. Thus, after a critically-saturated tensory driver has spun up for a sufficient duration, a percentage of the particle precursor will reform into tensora; the rest will reform back into hydrogen. This percentage is referred to as 'purity' which is a measurement of tensory efficiency.

## Catalysis

Molecular tensora, denoted as  $\mathbb{T}_2$ , are relatively stable analogues of  $H_2$  until catalyzed by metabolic processes. When catalyzed, the  $\mathbb{T}_2$  decays into  $H_2$ , producing force and light. The light is produced by excess energy being shedded from the tensons, which spontaneously emits massive quantities of photons, and the 'force' is produced when the spin of the tensons 'corrects' itself back to  $\text{spin-}\frac{1}{2}$ : during this process it has to 'wrap around' from double its initial value, which causes it to momentarily exceed  $\text{spin-}1$ . During this brief interval, the tensora strongly interact with other  $\text{spin-}1$  bosons such as photons, and even weakly interact with gravitons, the  $\text{spin-}2$  bosons that mediate gravity, producing the appearance of a localized force. The light produced by the spontaneous photon emission acts as visual feedback or a 'tracer' for the force, which would otherwise be invisible.

## Chroma

The wavelength of the photons that produce light during  $\mathbb{T}_2$  decay is referred to as one's chroma. Chroma is considered a fundamental part of an individual's identity because it is infinitesimally unique. The mechanism of spontaneous emission of photons during  $\mathbb{T}_2$  decay is well understood, but exactly what parameter of the tenson causes  $\mathbb{T}_2$  decay to shed mass/energy at such precise intervals to produce enormous quantities of photons with the exact same wavelength is an unsolved problem. A confounding variable is the strong but imperfect correlation between one's chroma and one's DNA. Children are most often born with a chroma that closely resembles either of their parents, but in approximately one-fifth of cases, the wavelength of their chroma will be a perfect average between both parents. There are no known cases of chroma being beyond the ranges of one's parents; e.g. parents with green and yellow chroma will not have children with red or violet chroma, and identical twins will always appear to have the exact same chroma. This produced a longstanding belief that chroma was a direct expression of genetics, but more recent analyses have proven that even identical twins have quantifiable differences of at least one-hundredth of a nanometer.

## Strength

The duration of tenson spin correction, much like chroma, is determined at the time of tenson creation by unknown parameters of tensory. The longer it takes for a tenson to correct its spin determines how long it will interact with higher-spin bosons, thus, a longer spin correction will produce an apparently 'stronger' force per  $\mathbb{T}_2$  particle. These differences barely reach the femtosecond order of magnitude, but the resulting effect is noticeably different at macroscopic scale.

# Teres

Muscles can metabolize  $\text{F}_2$  instead of  $\text{H}_2$ . When this occurs, a glow will begin to emit from their muscles, which may become visible through their skin. During moments of great physical exertion, especially when stimulated by adrenaline, the tensory works harder to convert  $\text{H}_2$  into  $\text{F}_2$  more rapidly. Potency will typically never exceed 1:1, as muscle tissues may become damaged from overstrain if the potency of their mana is much higher, thus the extent to which teres can utilize  $\text{F}_2$  is relatively limited compared to aves and silves.

# Aves

Under standard atmospheric conditions, detonation of  $\text{H}_2$  in the jet tube produces significantly greater thrust per particle than the decay of  $\text{F}_2$ , however, as long as there are other  $\text{H}_2$  detonations in the tube, the  $\text{H}_2$  byproduct of  $\text{F}_2$  decay will detonate as well.

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