9 Dimensional boundary chord interactions within the early nucleus

9.1 After the big-ping

As independent boundary chords and whole surviving tetrakaidecahedra ping into what would become our 3D universe, they will be prone to new relationships and interactions because of the finite size of this embryonic cosmos. High density and over-crowding - coupled with a momentum carried over from the big-snap, will prove to be the catalyst that through collision and reconfiguration, will eventually transform this early environment into the one we recognise today.

This would involve a two-stage reconfiguration of the whole surviving tetrakaidecahedron (the teddy), as it strives for equilibrium. These processes will herald the start of 'quantum-scale' interactions that will ultimately spark the forward march of evolution within our part of the universe. Centre-stage will be the dimensional boundary chords that make-up the teddies and these intimate relationships will be shown to occur within what we will come to recognise as the basic constituents of the atomic nucleus. Such interactions will be shown to be responsible for the origin of *not just* the nucleus, but of the elements too. That other close and very real relationship between the nucleus and its electron shell, suggests a subtle kind on inter-play between the positive and negative components of the atom that are even now, far from completely understood. With an interactive dimensional ladder that connects adjacent levels by a hidden set of (so far) undiscovered rules, a dim pattern begins to emerge that may point to a physical connection that spans two, three, or even all of these dimensional levels.

Regardless of its position on the periodic table, each naturally occurring element (isotopes aside for the moment), is a system in apparent equilibrium; where the positive charge of its nucleus seems perfectly balanced by the surrounding electron shell(s). This obvious and very basic of facts could actually prove quite profound, if looked at in a slightly different way.

Consider for a moment, an atomic nucleus that is comprised solely of dimensional boundary chords (see again Chapter Seven). These chords, now in our three (or as now propounded by this model); *four*-dimensional space, owe their origin to their tri-planar coordinates that in turn, were derived from 8D membrane energies. When the boundary chords dropped to our 3D level, these (now remnant) membrane energies ended up in a fifth dimensional level (8 – 3 = 5 etc.) and because of the *big-snap* that separated the chords in the first place, this 5D energy was endowed with a *compressive* (or contractive) component. The boundary chords and teddies that fell to our level, would not necessarily possess their own charge or mass as such but, because of an imposed spin, a reconfiguration would occur within the structure of the surviving teddies and a whole series of subtle interaction would begin between them *and* the supporting four-dimensional level in which they now found themselves buoyed.

In Chapter Seven of this submission, it was also argued that the necessary reconfiguration of the whole surviving teddy (because of both *'spin-conflict'* and the new environment in which it found itself), would naturally result in the synthesis of a dynamic, multi-part body, comprising an active, rotating set of circular 'H' chords and a smaller, static set of 'S' chords - that we would later come to recognise as an early form of the baryon. Within the nucleus, boundary chords will play an all important role in the processes of nucleosynthesis - and the intimate association between proton and neutron especially, will be seen to be entirely as a result of this inter-play between these objects' boundary chords and the *boundary chord rules* that in this model at least, will appear to govern them all.

With its boundary chord configuration determined by the condensation of secondary

membrane energy within the 8D lattice, the whole surviving teddy would ping into 3D space with a mass equivalent to:

$$36\ (M^{dbc}) \quad or \quad 36\ x\ 4.687\ x\ 10^{-29}\ kg$$

$$= \mathbf{1.687\ x\ 10^{-27}\ kg}$$

Had we as observers been there to examine these early objects when they first appeared in our part of the universe, this (supposedly) three-dimensional mass equivalence *may not* have been what we were expecting as far as their predicted measurements were concerned. Instead, we may have actually experienced great difficulty in detecting the slightest hint of these teddies at all and this would have everything to do with what may be termed their ***imposed inertia***. Dimensionally speaking, the whole surviving teddies and their independent boundary chord relatives would drop to their new 3D/4D level because of their origin from the 8D tri-planar coordinates. Their energy would be proportionally *less* than the original four-dimensional collection of spherical mini big-bang events that produced the 8D lattice in the first place. Teddies and boundary chords alike would therefore be floating within a more energetic, higher energy expansive medium - like water vapour that has just condensed within a larger volume of steam. The only difference between the two would be their energy value, while in both cases, there would seem to have occurred an apparent *phase change* between them (even though their relationship was actually somewhat further removed from that we find between water vapour and steam). This relationship though, between three-dimensional and four-dimensional levels would be a close one – and it is this intimacy that may have determined this *imposed inertia*. The mechanism that allows this to happen will in this model - be the waves.

When the whole surviving teddies pinged into our world after the big-snap, each of their individual boundary chord components (that made up any single side of their hexagonal or square faces) can be pictured as simply being a straight single connection between any two of the teddy's original points of convergence – or put even more simply – they would be a single straight line (see *Figure 9.1.01* below). Although these early teddies possessed face-spin bias, (a tendency for the chords to rotate around the edges of the hexagonal faces); this motion would also tend to be in straight lines relative to each individual chord – or describing what can be called a constant motion.

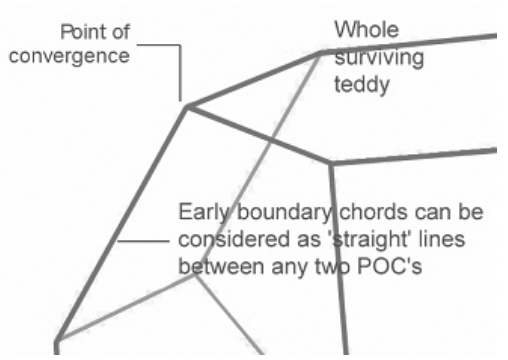

Figure 9.1.01 *The original whole surviving teddy would exhibit 'straight line' boundary chords each with an inferred constant motion.*

Although within a new environment, this original teddy would have *exactly* the same geometry as the 8D lattice from whence it came and although it was now supported within the expansive framework of four-dimensional space, this too would have originated from that very same geometry. While any such motion continued to follow this shared relationship, a balance could be maintained within the body of the whole surviving teddies that would not influence (or be influenced by) the surrounding and supporting (but apparently invisible) 4D medium, a little higher up the energy ladder from us. This shared motion refers to an inertia that involves only the teddy's boundary chords – and in this context, this will at this stage, only involve its *face-spin bias*. Pictured another way, the effects of this constant motion on each individual teddy may be likened to a collection of children's *jacks* floating through space, each of which shares the same set of axes; all of which are normal to the plane of any particular face (where this straight-line,

constant motion can only occur). The orientation of each jack however, can be allowed to be significantly different from the next (see *Figure 9.1.02* below).

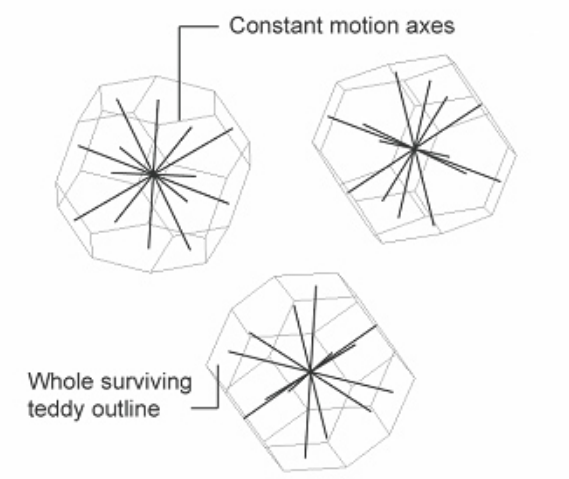

Figure 9.1.02 *The tendency for the original teddy's chords to try and rotate in straight lines, perpendicular to its constant motion axes will mean that it exhibits little or no mass in our 3D part of the universe.*

The whole surviving teddy's ***constant motion axes*** will determine what 'is' and what 'isn't' imposed inertia and any straight line that moves 'normal' to any one of these axes (within the body of the teddy), can be said to exhibit (inertia-less) constant motion. The teddy, at this early stage in its life will have an *inertia-less* face-spin bias and will not therefore, seem to exhibit any sign of mass in our three and four dimensional world directly after it pings into existence. This matter of *imposed inertia* will become an important one in a later chapter.

Once in this new 3D/4D environment however, the teddy will have to reconfigure, as it strives for equilibrium and its new *circular* 'H' and 'S' chords will now deviate from the straight line scenario; changing direction constantly as they try to revolve around their respective faces. They can now be considered as *accelerating* all the time and will thus be deviating continuously from the original constant motion axes of their host. This will create a disturbance in the surrounding 4D medium that will provide *imposed inertia* in our world. In other words, as the whole surviving teddies reconfigure their chords, they will also take on mass. As discussed earlier in Chapter Seven, the face-spin bias that tries to rotate the chords around the hexagonal faces, will create a *spin conflict* at the boundaries where hexagonal face meets hexagonal face. *Twice* the boundary chord mass is trying to take up the volume of a single boundary chord value and it is this that will induce the first of a two-stage reconfiguration.

9.2 Stage 1 reconfiguration

This *spin-conflict* will induce a separation of boundary chord material that will commence at these hexagonal to hexagonal boundary positions and effectively 'split' the chords because of this attempted rotation. This will result in the birth of independent 'face-centred' chords that will induce a modification of equilibrium within this new, unsupported and more rarefied environment and they will become *circular* in shape. Their mass equivalence should therefore become *HALF* that of the original chords, so that:

$$\frac{M^{dbc}}{2} = \frac{4.687^{-29}\,kg}{2} = \mathbf{2.343^{-29}\,kg}$$

This event however, will not be quite as straightforward as it would at first sight appear. The old 'points of convergence' *(POCs)*, or the original corners of the tetrakaidecahedron, will become areas where there occurs a ***tri-lateral chord separation*** and this process will release a great deal of energy. The reconfiguration of the teddy's chords around these areas must result in the juncture of three circular chords (centred upon *three* different faces). They will also be areas where two boundary chords were originally 'pushing' together from adjacent faces, both trying to fill the space meant only for a *single* boundary chord.

The *points of convergence* will be shifted away from where the corners once were (as they will no longer exist) and these new *POCs* will be located at what were previously the centres of the original

boundary chords. These *POCs* will have a mass equivalence of the two newly converging (half) chords at this point, but there would have also been a mass loss because of these chord separation events. Each of these ***tri-lateral separation points*** can be thought of as comprising what in essence, will resemble an asymmetric triangular area of negative curvature, bounded by three circular chords (see *Figure 9.2.01* below).

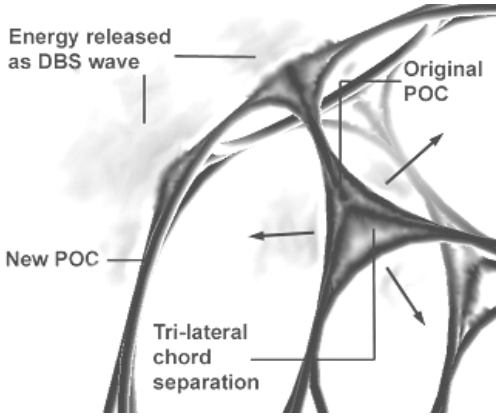

Figure 9.2.01 *Face-spin bias will instigate a reconfiguration of the whole surviving teddy's chords as they split in two. At the old POCs there will be a conversion of mass to dimensional boundary surface wave energy.*

The total mass loss experienced by the teddy will be the same as the combined mass conversion at each of these points and this will be intimately related to the ***2D membrane capacity*** of these asymmetric negatively curved triangular areas. This concept will be dealt with in more detail later in this chapter but basically, just as a more energetic four-dimensional energy may *condense* to produce a 3D (visible) impact that we could detect in our world (and visa-versa with the conversion of 3D mass to boundary surface wave energy); a 3D condensation would produce a two-dimensional result that *may not* be detectable by us.

As this 2D energy is just that, (length times breadth if you like); any 2D membrane capacity would be proportional to the area in question. These areas (previously occupied by the whole surviving teddy's corners), are also related to the original boundary chord's area conversion figures, first seen in Chapter Five of this submission; where the hexagonal faces were given a value of *0.433* and the square a value of *0.250*.

As the teddy reconfigures, these areas must become the juncture where two (previously) hexagonal and a single (previously) square chord now meet (although they are now circular). Any possible conversion of chord material at these *tri-lateral separation points* would actually come from this combination of $H + H + S$ boundary chord material and this ***tri-lateral split*** would involve a proportion of the original boundary chord's mass that can be expressed as follows:

$$\frac{H = 4.687 \times 10^{-29}\ kg \times 0.433}{10^2} = \mathbf{2.029 \times 10^{-31}\ kg}$$

$$\frac{S = 4.687 \times 10\ -29\ kg \times 0.250}{10^2} = \mathbf{1.171 \times 10^{-31}\ kg}$$

where *0.433* and *0.250* represent the original boundary chord area conversion and 10^2 represents the equivalent 2D membrane conversion factor.

The mass loss at each and every *tri-lateral separation point (TLSP)* will therefore be equivalent to:

$$\begin{aligned} &2.029 \times 10^{-31}\ kg\ (H) \\ +\ &2.029 \times 10^{-31}\ kg\ (H \\ +\ &1.171 \times 10^{-31}\ kg\ (S) \end{aligned}$$

$$\mathbf{5.229 \times 10^{-31}\ kg}$$

As there are a total of twenty-four *TLSPs* around the original whole surviving teddy, the total *(Stage 1)* mass loss will in turn equate to:

$$24 \times 5.229 \times 10^{-31}\ kg = \mathbf{1.255 \times 10^{-29}\ kg}$$

This figure therefore represents the total

(apparent) three-dimensional mass loss during this ***Stage 1*** reconfiguration of the whole surviving teddy; as *face-spin bias* acts as the catalyst that results in a new circular chord configuration. This mass loss can now be deducted from the original, in order to glimpse the character of this *new* teddy as it now displays its presence in our three-dimensional world.

This two-dimensional mass loss as the whole surviving teddy undergoes its *Stage 1* reconfiguration can be shown as follows:

Original teddy mass:	1.687×10^{-27} *kg*
Stage 1 mass loss:	$- 1.255 \times 10^{-29}$ *kg*
***New* teddy mass:**	$\mathbf{1.674 \times 10^{-27}}$ ***kg***

As the teddy completes this Stage 1 reconfiguration, this mass loss (comprising the total of 24No. tri-lateral separation points), will induce a redistribution of its overall mass component, resulting in a drop at the *POC* to give the boundary chord a new mass value of:

$$\boldsymbol{M^{dbc}} = \frac{2.325 \times 10^{-29}\ kg}{2} = \mathbf{2.325\ x\ 10\text{-}29\ kg}$$

With such an induced conversion from the original boundary chord connections to *Stage 1* reconfigured circular chords, the whole surviving teddy has in this model, become the ***neutron*** (see *Figure 9.2.02* in the column opposite).

The neutron in our world suffers from rather a short 'half-life' however, (about ten and a half minutes or so) and this may draw us to the conclusion that this *Stage 1* reconfiguration *IS NOT* the end of the story. As the neutron is produced by the conversion of its *TLSPs*, it must still be unstable in the sense that this well measured half-life indicates that this entity ultimately undergoes further conversion to a *proton*. Although this process hinted at here is at present somewhat of an 'over-simplification', something else clearly happens to the neutron and this is where there occurs what in this model, can now be referred to as the teddy's ***Stage 2*** reconfiguration. This must logically follow the first - for two very good reasons. First of all, the whole surviving teddies have *pinged* into what will become our version of the universe as *individuals* and not as part of the eight-dimensional lattice of which they were originally an integral part. This new environment in which

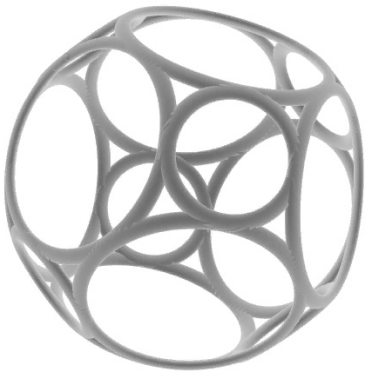

Figure 9.2.02 *As the whole surviving teddy undergoes what has been called its 'Stage 1' reconfiguration, its mass loss at the 'tri-lateral separation points' (TLSPs), will produce what we would recognise in our world as the neutron.*

the teddy finds itself, (i.e. the four-dimensional universe), will no longer be providing a supportive structure and this will not only help instigate the Stage 1 reconfiguration already described above – but will also cause a kind of ***degassing*** of boundary chord material *within* what have now become *circular* chord areas.

9.3 Stage 2 de-gassing

This will result in the condensation of a proportional amount of 3D boundary chord material, which will be characterised by a lower dimensional energy signature, not unlike the 2D membrane material already discussed in earlier chapters. This *de-gassing* will occur in a similar manner to that described in the *Stage 1* reconfiguration that occurred at the tri-lateral separation points *(TLSPs)* - although the component of 2D membrane material produced in this instance, will be proportional to the overall boundary chord mass of each type of circular

chord. The original hexagonal and square faces of the whole surviving teddy all originally shared (straight) boundary chords with neighbouring or adjacent faces but, each type of face (whether hexagonal or square or now circular) could be said to comprise the same *boundary chord value*. This would of course, result in a value of 'six' for the hexagonal face and 'four' for the square face - and these same values will need to be carried over to the newly configured round (or now circular) *Stage 1* teddy. As a result of the teddy's new geometry, the circular 'H' chord's *membrane component* will now be comprised of 2D condensate that originates from *SIX* areas of influence *(H1 – H6)*, whilst the smaller 'S' chord will gain its membrane component from just *FOUR* areas of influence *(S1-S4)*; This is illustrated in *Figure 9.3.01* below.

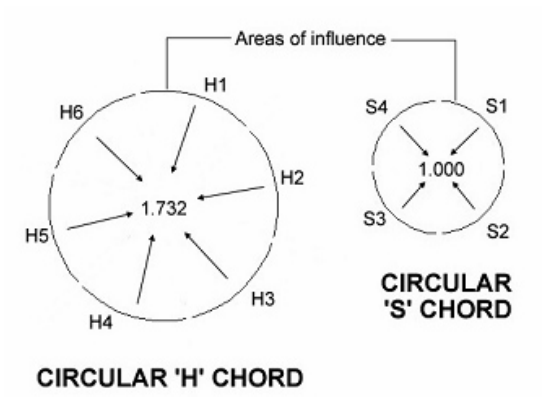

Figure 9.3.01 *2D membrane component areas of influence for the circular 'H' and 'S' chords (and their relative overall areas).*

The total membrane area of each and every *'H'* chord will be *1.732* times greater than that of the smaller *'S'* chords and because we can define a two-dimensional area as the result of two *single*-dimensional components (in other words, length times breadth) - any two adjacent ***areas of influence*** can therefore be said to produce a 2D membrane component - such as *H1+H2; S1+S2*; *H4+H3; S3+S2* etc., etc.. By definition, these values will be single-*dimensional* in nature and each of these components will be proportional to the new split boundary chord mass, relative to that particular *area of influence*.

These relative areas are derived from the original area rule first seen within the context of the eight-dimensional lattice's *tri-planar coordinates*, which saw a figure of *0.433* and *0.250* for the hexagonal and square component respectively. This provides the ratio of *1.000* to *1.732* shown in *Figure 8.05* above. Although sounding somewhat of a contradiction in terms, these new *areas of influence* (such *as H1, S1* etc.) are most definitely *single-dimensional* in nature and will therefore, require a *one-dimensional conversion factor* – and from our use of the simple cube in previous chapters (see page 19 for example), this will therefore necessitate the division of such resultant values by 10^3 thus:

'H' chord 2D membrane component at each *POC* will equal:

$$\frac{2.325 \times 10^{-29}\ kg}{10^3} = \mathbf{2.325 \times 10^{-32}\ kg}$$

Likewise, the 'S' chord's 2D component will be:

$$\frac{2.325 \times 10^{-29}\ kg}{10^3} = \mathbf{2.325 \times 10^{-32}\ kg}$$

As the circular 'H' chord's 2D membrane component is the product of *SIX* areas of influence in total, this will give an overall (3D) mass equivalence of $6 \times 2.325 \times 10^{-32}$ *kg* or:

$$\mathbf{1.395 \times 10^{-31}\ kg}$$ per 'H' chord.

The circular 'S' chord's 2D membrane component (from *FOUR* areas of influence in total) will be $4 \times 2.325 \times 10^{-32}$ kg or:

$$\mathbf{9.300 \times 10^{-32}\ kg}$$ per 'S' chord,

as this value is the product of just *FOUR* areas of influence, that make up this smaller chord, due to the fact that these smaller (previously square faces) comprise just four *boundary chord values*.

This process of *de-gassing*, is caused by the nature of this new 'rarefied' environment in which the teddy now finds itself enveloped. As an example, similar *man-made* processes (especially

in the plastics and foam industries), quite often call for a degassing stage; where a liquid compound can be placed within a sealed container that is then effectively evacuated of air. Any gas bubbles caught within the compound during the mixing phase, will 'de-gas' and rise to the surface as the pressure drops and can then be removed with evacuated air. This obviously lowers the risk of impurities, contaminants and flaws within the finished product.

Within the confines of the reconfiguring teddy, this boundary chord *de-gassing* phase will produce 'H' and 'S' face chord membranes that will 'use-up' and therefore contain within the bounds of these circular chords, a proportional amount of the teddy's apparent mass - provided as it is, by the boundary chords themselves (measured in this model, at the *points of convergence*). The total mass conversion (or apparent mass conversion) will therefore be:

For all the 'H' faces:

$8 \times 1.395 \times 10^{-31}\ kg \quad = \quad 1.116 \times 10^{-30}\ kg$

and for all the 'S' faces:

$6 \times 9.300 \times 10^{-32}\ kg \quad = \quad 5.580 \times 10^{-31}\ kg$

Total ***Stage 2*** mass conversion: ***1.674×10^{-30} kg***

Therefore, it could be argued that the *Stage 1* reconfigured teddy, (which has already lost mass), makes it presence felt in our world as what we would recognise (mass-wise at least) as the *neutron* and further:

Stage 1 teddy (neutron) $1.674 \times 10^{-27}\ kg$

Less *Stage 2* mass conversion: $1.674 \times 10^{-30}\ kg$

New teddy mass: 1.672×10^{-27} kg

As the de-gassing continues and produces these 2D membrane components within each of the circular chord areas, the *face-spin bias* (which will still have been in a certain amount of spin-conflict at what were previously the square faces of the original whole surviving teddy - *prior* to this reconfiguration), will be transferred to these membrane surfaces and this will cause them to rotate. This will not only solve what has been an inherent spin-conflict within the structure of the teddy, but will also create its own reaction at these rotating membranes. This conversion of face-spin bias into a rotational phenomenon, will not only produce what will be measurable spin within the new 2D membranes, but will also provide what amounts to a very real component of ***charge*** too.

The surface of the whole surviving teddy has a geometry that will now allow it to exist with circular 'H' and 'S' chord 2D membrane components *after* its reconfiguration - and because of the original *face-spin bias* centred around the hexagonal faces (now the 'larger' of its circular chords); these can be allowed to rotate as pairs within the confines of their parent (3D) surfaces. This will produce *(4 x 2)* ***'H' charge*** components – and *(3 x 2)* ***'S' charge*** components (see *Figure 9.3.02* below).

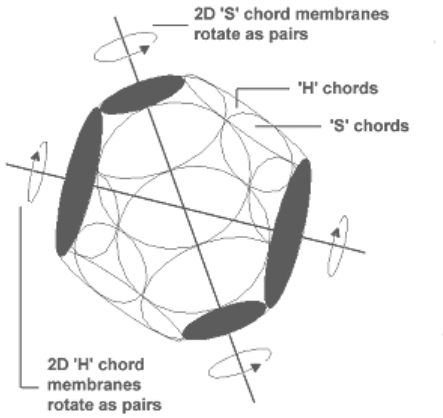

Figure 9.3.02 *2D membranes rotate as pairs within their chord structure and each type will contribute a specific characteristic to the teddy's charge. (Only one of each pair shown for clarity).*

The teddy's charge will be based on its ***spin ratios*** and these can in turn be calculated from the total areas of the 'H' faces against those of its 'S'

faces (both of which are now comprised of circular boundary chords). Each of the 'H' chords will have an (internal) area of circa 2.356×10^{-28} cm^2 so therefore the total 'H' face area:

$$8 \times 2.356 \times 10^{-28}\ cm^2 = \mathbf{1.884 \times 10^{-27}\ cm^2}$$

Likewise, each of the 'S' faces has an (internal) area that equates to *circa* 7.854×10^{-29} cm^2, so overall:

$$6 \times 7.854 \times 10^{-29}\ cm^2 = \mathbf{4.712 \times 10^{-28}\ cm^2}$$

The spin ratio will therefore be:

$$\frac{4.712 \times 10^{-28}\ cm^2}{1.884 \times 10^{-27}\ cm^2} = \mathbf{0.25}$$

The total 'H' face area is obviously the larger of the two and in this scenario; it will be allotted the ***positive*** component of charge usually associated with the proton. Charge-wise, this relates to *+1.333 or* $+{}^{4}/_{3}$, which by convention is usually assigned to the charge produced by the proton's two 'up' quarks. If the *FOUR* 'H' face pairs are allowed to produce a charge of $+\ {}^{1}/_{3}$ each, then the total 'H' face charge in this model will correspond to the required $+\ {}^{4}/_{3}$ previously contributed by these two 'up' quarks. Using the spin ratio of *0.25*, this allows the 'S' face pairs an overall (counter) charge of:

$$1.333\ (\text{or } {}^{4}/_{3}) \times 0.25 = \mathbf{0.333\ (or\ {}^{1}/_{3})}$$

This important concept of charge will be dealt with in much more detail in the next chapter, but the intention here is to argue that such phenomena *ARE* actually possible within the bounds of this model and that their origin and evolution are as a direct consequence of the teddy's own development as it drops into what we would define as three-dimensional space. It will also be argued (again in the next chapter), that this evolution through two distinct stages of reconfiguration, have been brought about not only by the inherent instability of the whole surviving teddy and its built-in *face-spin bias*; but also because of a change in environment as it pings into our own 3D/4D space. This evolutionary process can provide the whole surviving teddy with all the attributes that will allow it to be defined as both the neutron *AND* the proton in our world. The differences between them will be shown to be purely as a result of environmental conditions, brought about in the first place by the evolutionary stages experienced by the teddy itself, just after it makes its first appearance in what was later to become our world.

The completion of the *Stage 1* reconfiguration would have heralded the arrival of what we would call the neutron but, because of continuing spin-conflict within its structure - it would again evolve in a series of events that to us as 3D observers would appear like a real-time mass loss of detectable 3D material. This *Stage 2* reconfiguration will however, seem to have a reversible trend - as this is brought on by the additional component that is the environment. This later reconfiguration will endow the teddy with the mass and spin characteristics of the ***proton*** (see *Figure 9.3.03* below).

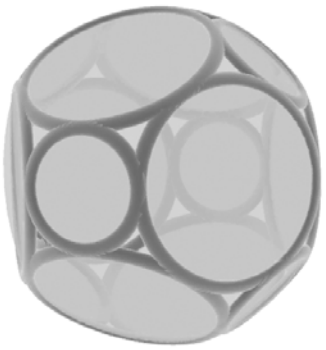

Figure 9.3.03 *The Stage 2 reconfiguration of the teddy will allow it to take on the characteristics of the proton in our 3D world.*

It will also be due to a series of interaction between chords and the rotation of 2D membrane material within, that the teddy will also be endowed with the additional characteristics of both spin and charge - all of which will play a vital and all-important part in the further evolution of our 3D/4D universe.