# The Fundamental Atomic Model

Sean R. Torrebadell
15087 Canary Drive, Surrey, B.C., Canada, V3R 4V4
e-mail: Neutron-man@hotmail.com website: TheFundamentalTheory.com

The Fundamental Theory requires neutrons to accumulate within the center of the nucleus, in a highly organized manner, a dense 'neutron core'. Repulsive protons must remain as far apart from one another as their nucleonic bond with neutrons of the core allow, forming a 'protonic shell'. Electrons should orbit the individual protonic ligands of a structured nucleus, forming 'nuclear hydrogen'. These, in turn, can form 'nuclear covalent bonds', nuclear $H_2$, which we identify as 'lone pairs' of electrons. The electronic shroud of electrons, therefore, consists of electrons that are localized around the nucleus, in geometrically fixed positions, in degenerate shells, because they are bound to and interacting on a one to one basis with the protons of a structured nucleus. Not only does this picturesque model superimpose itself over the known empirical facts, it explains why one combination of protons and neutrons is stable and abundant, while another is not. Neutron B-decay ratios of unstable nuclei are used to 'prove' that structured nuclei do exist, in the geometrical manner prescribed.

## 1. The Nature of the Problem:

### 1.1 The Mechanism of Charge is not defined:

It would appear that the proton and electron possess some inherent attribute that causes them to move together, or apart, as the case may be. The concept of charge was subsequently introduced as a label for the relative interactions of these particles. An electron is supposed to possess negative charge, while a proton is supposed to possess positive charge. Like charges repel, while opposite charges attract. More importantly, charge is quantum in nature, and an electron always has an equal and opposite charge to a proton. It follows that the same coulombic force exists between a proton and an antiproton, as exists between a positron and an electron. The only difference between the two interactions is the inertial resistance of their respective masses. The problem is that we have no explanation of how or why they interact the way they do. All we have determined is that these particles must possess another inherent property, besides mass, that is responsible for a force that is distinct from gravity. In other words, we really don't know what charge is in the first place! To further complicate the matter, neutral particles exist, which can give rise to pair production. For instance, the neutron decays into a proton, an electron and a neutrino the majority of times. Similarly the photon can become an electron and a positron, which can also collide and annihilate into energy. In all cases, annihilation and pair production events were not supposed to be used to suggest that the particles involved are composite in nature[4] –that they might be composed of positive and negative groups that appear neutral as a whole. So we have three different states associated with particles, the positive, negative, and neutral –which we can't explain from a classical perspective.

### 1.2 The Atomic Landscape:

Thomson[2], who is known for the plum pudding model, argued that protons and electrons must mix, because there is no reason why two oppositely charged particles should stay apart. This requirement of electrodynamics came into question when Rutherford[3] discovered that an atom possessed a central density - initially thought to consist entirely of protons. The concept of the nucleus was born, with no explanation of how or why repulsive protons could do just that.

Rutherford's model, which required electrons to orbit the nucleus, came under scrutiny, because electrodynamics required accelerating electrons to continuously emit energy, causing their orbit to decay. Bohr[4] shattered this 'notion', when he effectively *proved* that the orbits of electrons in Hydrogen are quantum in nature. Unfortunately, Bohr could not explain how the electron existed when it dropped from one stationary orbit to another, emitting a photon. Further, the idea that the transition was instantaneous, contradicted the speed of light limit. Ultimately, Bohr's model was discarded because it only worked for Hydrogen-like systems, with just one electron.

Prior to even quantum theory, chemists recognized that electrons do not orbit the entire nucleus; rather they are localized to and occupy specific geometrical locations around the nucleus. This, at least, has provided us with the ability to appreciate how covalent bonds situate, and more importantly, how molecular shapes result. The difficulty is underlined by the existence of several bond theories, each of which appears to be incomplete. Certainly, chemists require repulsive electrons on the outside of the nucleus to justify the existence of covalent bonds, but even they fail to explain how the overlap of two repulsive electron densities is even possible.

When the electron's wave nature was proven, theorists chose to ignore that the electron *is* a particle, with a trajectory, and instead used a wave equation to approximate the electron's position and momentum at any given time. Quantum theory has taken over, because it is in no way, shape, or form, a mechanical model. As such it is not accountable to explain how, why, or in what manner an electron absorbs or emits photons, or what this type of energy represents. Further, it has no need or requirement of explaining the nature of forces, what charge is, and therefore how 'repulsive' electrons localize to specific regions around a nucleus, or how they pair together as 'lone pairs' of non bonding electrons. Quantum theory has neither the need nor ability to explain the structure of the nucleus, because it attempts to describe all atomic phenomena as a function of the electron's wave nature.

It is very difficult to create a model in the subatomic realm, if you don't know anything about the structure, nature, or interaction of the participants. In the end, mathematical reproduction of known facts, takes over. The nucleus remains a mystery, surrounded by a statistical shroud of electron densities, and obscured by a statistical treatment that argues that a physical model is impossible.

## 1.3 Limitations of a Nucleon Model:

Understand, that all of this was done before the neutron was discovered in 1932. When the neutron was discovered, it was still necessary to explain how protons could be in such close proximity. It was theorized that a 'strong nuclear force' existed which was stronger than the proton's electromagnetic repulsion. Collision experiments of the 50's could not find any difference between the scattering of the proton and the neutron. It was concluded that protons and neutrons must be evenly distributed within the nucleus, and that the strong force must be shared equally between protons and neutrons.

With the success of the electromagnetic theory of light, in which the photon was proposed to be the intermediate of the electromagnetic force, physicists decided to implement a particle exchange theory to account for the short range of the strong force. It was suggested that the strong force between protons and neutrons was mediated by a short-lived particle, with a mass approximately 200 times that of an electron, called a meson. It was proposed that the exchange of mesons caused protons and neutrons to convert back and forth into one another. A search for this particle was first done with cosmic rays, because particle accelerators did not exist. The first candidate, initially called the mu-meson, met the predicted requirements of mass and instability, but it was too penetrating and failed to interact as required. This particle was renamed, the 'muon'. Eventually, pions were discovered, which do interact as required, evidenced by that fact that most decay in the atmosphere. The question is how do they exist in cosmic rays, when they are never supposed to last long enough to leave the nucleus? In addition to the charged pions, neutral pions were predicted and discovered. The nucleonic interaction treated the proton and neutron as almost equal entities, forcing us to consider and treat the protons and neutrons as 'nucleons'. The three pions are supposed to be the intermediary particles of the nucleons.

The concept of nucleons presents scientists with the same limitations as putting blinders on a racehorse. In the case of the horse it eliminates distractions, and forces the horse to consider only one direction. In the case of science, we are forced to consider the nucleus as a random arrangement of protons and neutrons that are constantly changing position, negating the possibility of a structured nucleus consisting of individual protons and neutrons. Ultimately, the unsubstantiated concept of particle exchange forces us to concentrate all of our attention upon the atom's electronic landscape, bypassing the possibility that the electronic landscape is a reflection of or possibly due to the structure of the nucleus itself. The fact of the matter is, that while we have a wonderful catalogue of electron energy levels, we have no logical explanation of how or why *repulsive* electrons organize outside of the nucleus -which is essential to chemistry.

Quantum theory, however, would have us accept that repulsive electrons localize to specific regions around a nucleus, based entirely upon their wave nature. It would have us accept that a strong force exists within the nucleus, which acts independent of the electromagnetic forces between the nucleus and the electron shell. To complicate matters, the decay of neutrons within the nucleus involved the release of high-energy electrons from the nucleus, the existence of which required a third and much weaker force to exist, the weak force. With the advent of quantum theory, modifications to the nucleon model were made, which suggests that a super-strong force exists…

## 1.4 Flaws within the Electron Shell Model:

Modern science would have us believe that atoms, shrouded by various shells of repulsive electrons or electron densities, are capable of being attracted to one another. It would have us believe that two repulsive electrons can pair together in the same vicinity, passing off the apparent contradiction by saying that they have opposite spin, without explaining how and why this negates their mutual repulsion. The fact of the matter is that electrons repel one another. If an atom is shrouded in electrons it will repel other atoms. Even if the nucleus has protons in it, electron-electron repulsion would be greater than the attraction, because of the difference in radius.

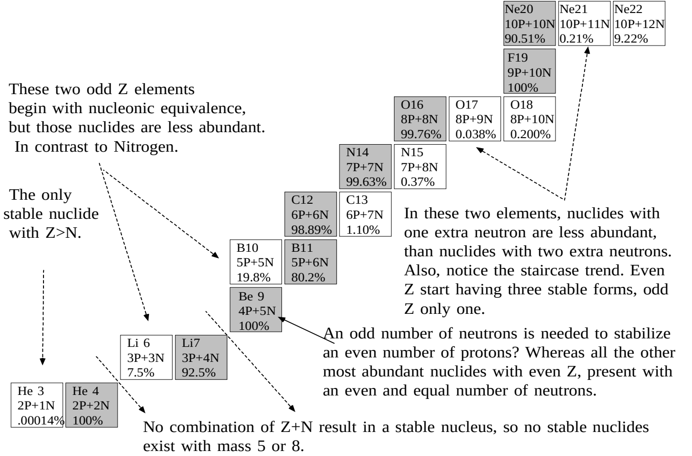
The truth of the matter is that electrons are on the outside of the nucleus, and that a hierarchy of energy is associated with electrons surrounding the nucleus -confirming the existence of electron shells. The truth is that electrons do pair with opposite orbital spin forming nonbonding pairs of electrons or "lone pairs", and that both of these are localized to specific regions around a nucleus. The truth is that covalent bonds exist, and that a covalent bond must involve the sharing of two electrons. The problem is that modern science has failed to explain, to adequately justify how all of this is actually possible. While Quantum Theory boasts that it is able to account for all atomic and molecular interactions, the fact remains that it in no way shape or form explains how, or provides a model to describe why, the subatomic realm exists as it does. It remains an incomplete description at best, which violates of the simplest rules of electrodynamics. The picture of the atom is incomplete.

Consider, that atoms have an inherent tendency to exist in a neutral state, which in the common mind makes sense because a given number of positive charges are neutralized by a given number of negative charges. What logic are we to use to explain why a multitude of electrons do not flock to and saturate the space around a positive nucleus? Even if we imbue protons with the ability to bind electrons through other nucleons, regardless of how deep the protons become buried in the nucleus, even if we ignore that the protons of an interchanging nucleon model must constantly change position, even if we ignore that protons and neutrons should insulate and interfere with an actual bond between a proton and electron, even if we have no way of assigning which proton binds which electron - there is no reason why a proton would not attract more than one electron, unless we ignore everything that we know to be true about electrodynamics!

The reticent question, which cannot be passed off or explained by the nucleon model or subsequent modifications to that model, including the addition of the quark model, the super-strong force, and gluons, and glueballs as particle exchange mediators between partially charged quarks, is: How is it possible for protons, buried in the depths of the nucleus, to maintain a one to one electromagnetic attraction or bond with specifically arranged electrons in the electronic atmosphere? The answer has always been, as Thomson suggested in his plum pudding model, the one ridiculed the most in modern times -protons and electrons must mix, and must interact on a one to one basis, because the laws of electrodynamics require it to be so! The only tenable solution is**- *Nuclear Hydrogen must exist!*** The implications are profound. For electron shells to exist, nuclear Hydrogen must also exist in relatively electrostatic shells. How might this be possible, and more importantly, where do the neutrons go, and how do they really interact with protons?

## 1.5 The Chart of Nuclides:

In contrast to the seemingly well-ordered nature of the periodic table, which is exceptional, albeit overstated, in its ability to organize the elements according to similar chemical properties, the chart of nuclides shows not only patterns, but also irregularities, which suggests that there is a complex underlying logic that determines the stability of nuclides, and the unique balance between protons and neutrons. What the average student of science fails to realize is that the elements catalogued into the periodic table are a chaotic mixture of different stable nuclides, of different mass (Z+N), and abundance. For instance, in the simplified nuclide chart below, we can see that there is: 1 stable form of B & F; 2 stable forms of He, Li, B, C, & N; and 3 stable forms of O & Ne. Why?



These two odd Z elements begin with nucleonic equivalence, but those nuclides are less abundant. In contrast to Nitrogen.

The only stable nuclide with Z>N.

In these two elements, nuclides with one extra neutron are less abundant, than nuclides with two extra neutrons. Also, notice the staircase trend. Even Z start having three stable forms, odd Z only one.

An odd number of neutrons is needed to stabilize an even number of protons? Whereas all the other most abundant nuclides with even Z, present with an even and equal number of neutrons.

No combination of Z+N result in a stable nucleus, so no stable nuclides exist with mass 5 or 8.

**Figure 1:** Simplified Chart of nuclides, which shows only the stable nuclides, their mass, the number of neutrons, and relative abundance.

In the nuclide chart above, we can see that He3 is the only nuclide with more protons than neutrons. In this selection of elements, the most abundant nuclide of each even Z element, with the exception of Be, has an equal number of neutrons, 'nucleonic equivalence'. Elements with an odd Z, however, find abundance with one more neutron, an even number of neutrons - with the exception of N14. Aside from simple trends and observations, there has never been an explanation of how many neutrons are needed to stabilize a nucleus, why one number is sufficient and another not, why some elements can have more than one stable nuclide, extra neutrons as it were, another not.

In modern science, there is no explanation why certain combinations of protons and neutrons, sometimes any combination thereof, cannot result in a stable nuclide. For instance, there is no explanation why there are no stable nuclides with mass 5 or 8, or stable nuclei with 19N or 21N, or why Tc and Pm do not exist in a stable form. Aside from simple numerology, there is no real understanding why a particular combination of protons and neutrons is more stable than another, 'magic' as it were. In the nuclide chart above, He 4, O16, and Ne20 are the most stable, or 'magic'. This has led to the simple observation that nucleons (Z+N) composed of 2, 8 or 20(in this section of the elements) are more stable than others. Nuclides consisting of two such numbers are doubly magic. The irony, of course, is that no stable nuclide of mass 8 exists. In retrospect, bombarding nuclei and determining that certain combinations of protons and neutrons are more stable, should have been the first confirmation that nuclear structure exists.

## 1.6 The flaws of modern science:

The greatest mistake of modern science is its insistence that action at a distance is qualified, underlined by its acceptance that substance is a physical body, composed of matter, separated by non-existent void. It ignores the fact that wave phenomenon, the concept itself alone, requires the existence of an interstitial medium to remain qualified. By analogy, we cannot conceive of waves in water without water. Further, modern science fails to consider that it is possible for a boat, to be in water, to create waves as it moves, without it meaning that the boat is the wave. In the same respect, we cannot qualify the wave nature of subatomic particles without the existence of some interstitial medium, and just because particles have wave properties, does not mean that they are waves...

The question is not whether or not an ether exists, but how that ether exists. What the mainstream of science fails to realize is that it may only be their concept of an electromagnetic 'ether', which was disproved. Is there any other way that the ether might exist relative to charged particles, the earth, or other planets, which is not taken into consideration by the Michelson Morely experiment? It is a mistake to assume that the existence of an interstitial medium has been disproved.

The difficulty is compounded by the general acceptance within mainstream science that in addition to matter, that antimatter exists, and the belief that matter and anti-matter, annihilate. To complicate matters, this type of logic, has transferred over into the realm of charge, and scientists accept, without qualification that oppositely charged particles, like the electron and the positron, annihilate into a photon of energy. Scientists appear to ignore the fact that a photon has been shown, proven, to be a particle. While both the electron and the positron are effectively particles, the photon that is created when they combine, is considered to be, or at least treated like it is incorporeal in nature. The contradiction is that it is impossible for contraries to physically act upon one another. So the incommensurable idea that a photon is an incorporeal package of energy, capable of being added to a physical body, is not qualified. The idea that a proton and an antiproton annihilate is also a subject of concern.

In the case of the neutron, rather than suggest that a neutron is neutral because it is composed of an equal number of positive and negative charges, scientists instituted an unverifiable theory that is so far from reality, that one could say that the whole thing is quarked! Their idea is that protons, neutrons and electrons are composed of quarks, which have 'partial charges', which add up to the observed net charges of those particles. The arbitrary nature of the model reveals itself, in the fact that every time new particles were found, which did not fit or whenever the number exceeded the existing quark model -that new fanciful quarks were conjured up as it were, to expand the model. The end result is an impotent quark catalogue of subatomic particles, which serves more as an intellectual lock, than a footpath to reason.

The Fundamental Theory suggests that all subatomic particles are composed of Fundamentals. It describes various levels of elementary particle structure, which appear to be consistent with the known particles of the nucleus, including the unstable neutron, which is supposed to be composed of a proton and an antiproton, spinning around one another. The Fundamental Theory challenges the concept of annihilation, particle exchange between nucleons, the structure of all particles, and proposes that the nuclei are structured.

## 2.0 Nuclear Shell Structure:

## 2.1 The Composite Neutron:

According to The Fundamental Theory[5], the neutron is composed of a proton and an antiproton spinning around one another. This is a challenge to the notion that these two particles can annihilate, and the unverifiable theory that the neutron is composed of a combination of partial charged quarks. This also dismisses the idea that the strong nuclear force is mediated by particle exchange. Understand that there is no evidence that partial charged entities exist, only that the neutron has substructure, where the same evidence supports this model. The only obstacle is that this model suggests that neutron decay involves the forbidden decay of a baryon, the antiproton.

## 2.2 The Neutron Core Theory:

The idea that a neutron is neutral because it is composed of two oppositely charged bodies opens the door to an entirely different atomic model. If a neutron is composed of a proton and an antiproton, the model requires it to have twice the strong force pull of a single proton. By strong force, I am referring to the strong inward flow of space into fundamentals. A proton has 3, while a neutron has six fundamental pulls. It follows that neutrons should accumulate within the center of the nucleus, in a dense 'neutron core'. The question becomes, how do composite neutrons in the nucleus stay apart?

## 2.3 How Neutrons interact:

Even in the presence of a strong force, neutrons that gather in the core of the nucleus should still continue to interact along the plane of their electric fields, where the fluctuating field pressure is a relative minimum. In other words, the *electric force does not turn off*, and why would it? If two neutrons spin at the same frequency, undulating periods of net electric attraction and repulsion should occur. The neutrons should oscillate in relatively fixed localized areas relative to one another, depending upon the number of neutrons, and their orientation. The neutrons need to spin in phase, not arbitrarily so, but because at the closest point of contact, between two neutrons, the interaction of a positive and negative protonic component, moving contrary to one another, creates a local minimum field of less overall pressure. All things naturally move from all other orientations of greater overall field pressure, to less pressure, at the same radius.

## 2.4 How Composite Neutrons stay apart:

The interesting thing is that if a neutron already consists of a proton and an antiproton, that each component should already have sufficient internal spin motion to escape the inward strong force of either protonic component in the neutron. So even though the positive component of one neutron and the negative component of another pass in close proximity, because they are moving contrary to one another, they actually possess twice the relative motion necessary to thwart the strong force pull of a single protonic component. It follows that even during the period of greatest electric and strong force attraction, that each has just enough relative motion to thwart the inward pull of an entire neutron.

## 2.5 A Structured Neutron Core:

It follows that neutrons pulled inward by the strong force should acquire an oscillatory electrostatic-like equilibrium, which counters the inward strong force motion overall. In the simpler nuclei, neutrons should arrange symmetrically, aligned within the plane of their electric field spin. However, the accumulation of neutrons, and thus strong force contributors, will eventually pull the neutrons into more three-dimensional structures. When this occurs, the electric field of neutrons will align with the net electric field of the core, as a whole, where the field pressure is a local minimum.

## 2.6 General Principle of Neutron Core stability:

The oscillation of neutrons within the core is a wave-like phenomenon, and in that sense, harmonic states should result in more stable oscillatory configurations. In order to create a harmonic or balanced oscillation, symmetry is required. That is not to say that a symmetrical core is an absolute requirement, only that the more symmetrical the core is overall, the more stable it should be in general. I say, 'in general', because there are other contributing factors, which include the orientation and interaction of neutrons with protons within the nucleus, as well as the overall symmetry of the entire nucleus.

## 2.7 Protonic Ligand Theory:

If a neutron in the core decays, that is to say, if an antiproton decays, it will leave a proton, which will initially escape the neutron core, but the inward flow of space should also decelerate it. Eventually it will reach an apex position. Simultaneously, the proton should be subject to an electric oscillation, such that it is exposed intermittently to the positive and negative components of the neutron(s) in the core as the neutron spins-a nucleonic bond. The proton reaches an equilibrium point wherein this oscillation, and its own motion against the strong inward force, allows it to remain suspended, somewhat distant to the core. At the same time, repulsive protons will tend to remain, as far apart from one another as their nucleonic bonds with the neutron core will allow, because their pressure fields repel one another. In the case of the Helium nuclei, it is possible that the nucleus spins. For more complex systems, the protons may oscillate in a relatively fixed position.

## 2.8 Electron Shell Model:

While an electron could orbit an entire nucleus, it is more likely that each is captured by the strong force of individual protonic ligands of a structured nucleus. The implications are profound. The localization of electrons is not due to their individual wave nature, rather, they are due to their one to one interaction with individual protonic ligands of a structured nucleus. Is it a coincidence, that the molecular structure of cations is not addressed in chemistry? For instance, we know that the shape of $CH_4$ is tetrahedral, but what is the shape of $CH_3+$, which has one less H & electron? Is it possible that electrons have reservations? Otherwise, we would have to explain how an electron knows what energy it must have before the environment it will occupy, actually exists.

## 2.9 Electron Orbits:

In this model, electrons fall into and slingshot around an individual protonic ligand of a structured nucleus in a capture and escape cycle, which returns them to the same apex of their orbit. In the case of free molecular Hydrogen, the electron orbits the proton in a series of open loops. In other words, electron density rotates around the free proton.

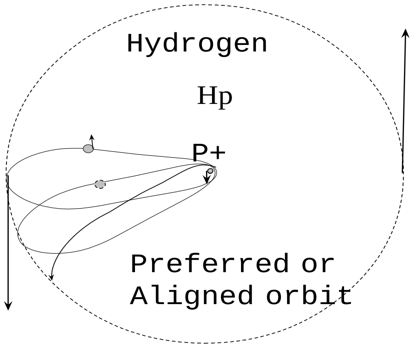


**Figure 2:** Electron density rotates around a free proton, consisting of open loops of electron capture and escape.

In the case of nuclear Hydrogen, the increasing pressure of the nucleus will close the loops, forcing the electron density to remain, intermittently, on the outside of the nucleus in a localized region.

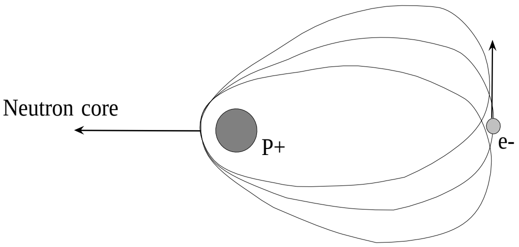


**Figure 3:** Electron density is concentrated to the outside of a nucleus, consisting of closed loops of electron capture and escape.

It follows that ***electrons are localized to specific regions around a nucleus, because they are held in that vicinity by their attraction to and one to one interaction with the 'individual protonic' ligands of a structured nucleus,*** rather than as a function of an electron's individual wave properties. That is not to say that each electron orbit is not or does not involve a wave phenomenon, only that the ***distribution*** of those orbits is dictated by the structure of the nucleus. It follows that there should be a one to one correspondence, with a few corrections, with what we already know about the electron shell model.

In the atomic environment, the quantum nature of an electron's orbit is related to integral amounts of spin, and the stability of these orbits is a wave phenomenon. I will explain quantum restriction in more detail, in a future paper, which addresses the mechanism of atomic spectra.

For now it is important to realize that this model explains how and why **repulsive** electrons are able to localize, in close proximity to one another, and more importantly, how they appear to remain on the outside of the nucleus as a whole, which is required if we are to justify chemical bonds.

## 2.10 Covalent Bonds:

In this model, when an electron falls into the nucleus, the polarity of charge in that localized region of the atom shifts. The valence proton becomes exposed to the external environment and is therefore capable of being attracted to the electronic shroud of 'other' nuclei. Each nuclear H is a potential covalent bonding site, where a covalent bond is redefined as the intermittent coulombic force of attraction between the protonic ligand of one nucleus, and the electron orbiting the protonic ligand of another nucleus, within the electric field plane of their aligned internal spins. In order to form a stable covalent bond, only 'one' electron can be between the protonic ligand of one nucleus and another, at any given time.

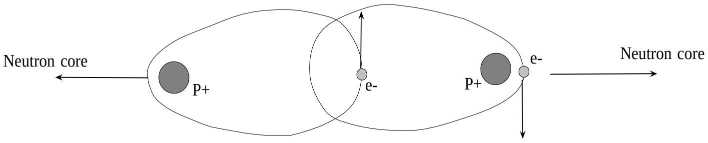


**Figure 4:** A molecular covalent bond between two nuclear Hydrogen.

The strength of a covalent bond should be proportional to how similar the orbital speeds of the electrons are on the two nuclei involved in the bond. The electrons in the bond must be Hydrogen-like to some degree, with opposite orbital spin, in order to form any semblance of a bond. This arrangement minimizes the repulsion between both electrons and protons in the atom, and with respect to covalent bonds maintains a net force of attraction via interchanging electron bridges.

## 2.11 Nuclear Covalent bonds or Lone Pairs:

It follows naturally that nuclear hydrogen, if forced into close proximity, should be able to form a 'nuclear covalent bond', resulting in nuclear $H_2$. Again, only one electron occupies the space between the two repulsive protons at any given time. In the classical scheme of things, we identify this system as a non-bonding 'lone pair' of electrons. The system is covalently inert, because one electron is basically on the outside of the system at all times, which prevents either nuclear Hydrogen in that system from forming a stable molecular covalent bond, by electron-electron interference.

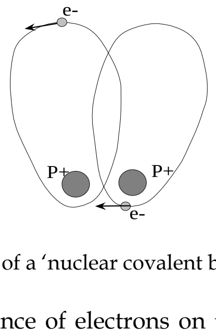


**Figure 5**: A depiction of a 'nuclear covalent bond', nuclear $H_2$

The constant presence of electrons on the outside of a lone pair makes them an important chemical feature, where the number and density of lone pairs is directly related to electronegativity. Nuclear $H_2$ can be forced apart, and if the neutron core structure compliments other proton shell geometries, some elements can have more than one oxidation state, or, 'number of covalent bonding sites'.

## 3.0 Nuclear Stability:

### 3.1 Nucleonic Stabilization of a Neutron:

According to the Fundamental Theory[6], the relative motion of the antiproton's fundamental component combines with that of the neutron's spin as a whole, as it skims the outside of the neutron system. A collision, combined with the added force of an asymmetrical field may provide that fundamental with the added speed necessary to escape, which we see as a neutrino.

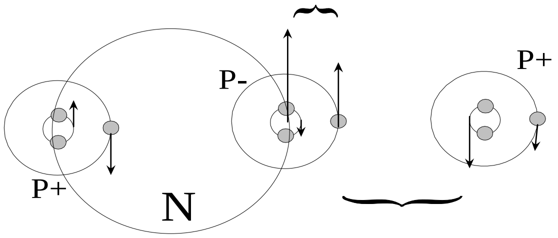


**Figure 6:** A nucleonic interaction. Top view of the internal spin of a composite neutron, in the presence of an external proton.

If, however, a proton interacts with the neutron, the spinning field of the proton's electronic component will spin contrary to this motion, sending waves of pressure that will slow the antiproton's fundamental. As the fundamental slows it will become larger and will be pulled back inward by the strong force flow preventing it from escaping. I call this *'nucleonic'* stabilization. The problem is that this will only occur when the ligand proton is exposed to the antiproton component of the neutron, during half of the neutron's spin. In theory, a neutron would be fully stabilized if it were situated between two protons. Therefore, the first stable atom should be Helium 3, which explains why it is the only stable nuclide with more protons than neutrons.

### 3.2 Neutronic Stabilization of a Neutron:

It is conceivable that the proton of one neutron will always be exposed to the antiproton of the other if the two spin in phase within the electric field of their interaction. In which case, the proton of one neutron should help to stabilize the antiproton of the other- the other half of the time. Extending this logic, in order for a nucleus to be completely stable, the neutrons of the core need to be arranged symmetrically, because an asymmetrical electric field is a force, which can cause neutrons to decay.

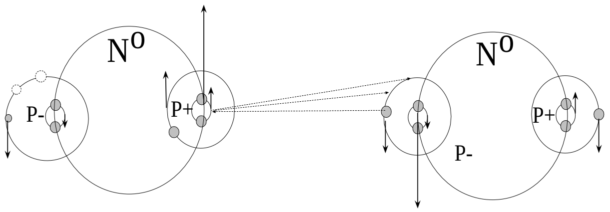


**Figure 7:** A neutronic interaction, between two neutrons spinning.

To a lesser extent, nuclear stability also depends upon proton shell symmetry, if it compliments the core, and whether it shields the outer shell neutrons of the core. Note: I represent the pressure gradient around a neutron and a proton as a sphere, where the equator represents the electric field plane of internal spin.

### 3.3 Neutron Core Condensation

As the number of neutrons increases, the increasing strong force will force neutrons to 'condense' into precise geometrical structures. While the strong force dominates, the neutrons will still align and interact along the electric field of their internal spin. All nuclei will have an electric field equator, and a magnetic axis of symmetry. Above and below the electric field equator, there will be an hourglass curvature of the same electric field -as neutrons begin to interact electronically at an angle to the core. Protons will arrange along this curvature, aligned with the electric field plane of the neutrons they bind to. Nuclear isomers are possible depending upon whether neutrons situate above or below the equator.

### 3.4 Covalent Bond Angles:

Covalent bond angles should correspond directly with the structure of the neutron core, where the only restriction is the ability of protons to coordinate within openings of the existing protonic shell. In other words, the structure of our theoretical nuclei should match the empirically determined bond angles of the electron shell model, if not explain the odd angles we often empirically determine. Of course, the bond angles will be slightly distorted by the presence of lone pairs within a protonic shell, and bond angles will increase depending upon the size and number of lone pairs on the atom that a central atom binds to, which pushes them apart. Keep in mind, that a covalent bond requires electron orbits to be aligned in the electric field plane of their spin.

### 3.5 Increasing Numbers of Neutrons:

As the neutron core becomes more substantial, the effects of asymmetry become less pronounced, as the neutrons core's size buffers the effects. Similarly, the more developed the protonic shells are around a particular neutron core, the more 'shielded outer neutron shell positions' there are, which can be filled with extra neutrons –until local neutron symmetry is broken. Sometimes several extra neutrons are required to fill in neutron shell positions, before one reaches a position that is capable of binding another proton, in an opening of the existing protonic shell. So irregular jumps in the number of neutrons required to stabilize a particular number of protons is expected. In some cases, a neutron core is not capable of complimenting a protonic shell, and or given its own asymmetry, does not have the ability to form a stable nuclide. It follows that some neutron cores, simply do not exist in a stable nuclide. In some rare instances, the neutron core cannot compliment a particular Z, which means that the element does not exist in nature. In the periodicity of the nuclide chart, the number of neutrons should gradually outweigh the number of protons in a random appearing fashion. However, this model will show that there is nothing random about the chart of nuclides. This model matches the chart of nuclides, and shows that it could not exist in any other way. It will become apparent that the regular and irregular trends, gaps, and hiccups, are there for specific reasons. Questions that have baffled scientists for years are answered in a matter of fact manner. For instance, in a future paper, we will see why Argon's most abundant nuclide is composed of 18P+22N, which gives it a mass greater than that of Calcium's most abundant nuclide, which has just 20P+20N? I call this the Argon-Calcium Bridge.

## 3.6 The Magic Numbers:

In this model, the occurrence of magic nuclei is simply a corollary, an observation within the model, that those nuclei which have been empirically identified as more stable, or 'magic', are the ones with the most symmetrically complete neutron cores and protonic shells. Basically, asymmetry equates to a net electromagnetic force, which cannot help a nucleus stay together when subjected to bombardment. The problem is that protons repel one another, and during bombardment, it is more likely that a nucleus with more 'lone pairs' will present as more stable. In that respect, the stability of the atoms does correspond to a degree with completed electron shells, including noble states. Alone, the 'magic numbers' themselves are a mathematical coincidence, a weak reflection of the underlying stability of certain nuclei. It needs to be appreciated, and this model will show, that there are unusually stable nuclei that do not fit into the more classical 'magic number' scheme, but which meet the requirements of completed symmetry within this model.

## 3.7 General Rules of Stability:

This model ***predicts which combinations of protons and neutrons are stable,*** if not more stable, and why certain combinations, or any combination of Z+N is not stable. The following are some 'a priori' rules for a stable nucleus:

1. The overall symmetry of the neutron core must match that of the protonic shell.
2. An extra neutron, if shielded by a proton, will remain stable if symmetrically situated.
3. Will cause other outer shell neutrons to decay if its presence creates an asymmetrical field.
4. Extra neutrons, not shielded by an existing protonic ligand or proton shell are subject to decay.
5. Shielded neutrons affect the degeneracy of the protonic shell if asymmetrical -cause distortions in the protonic shell.
6. An even number of neutrons always provides more stability to the octahedral cores by adding symmetry.
7. A protonic ligand is unstable if the core is missing (stripped) of a neutron required to bind it. Electron Capture, E.C., occurs. A neutron forms.
8. A lone pair, nuclear $H_2$ is unstable if the neutron required to bind it is missing, B+ decay occurs. A neutron forms.
9. A degenerate neutron core, or a core with full symmetry is always more stable.
10. Bound neutrons are stable in a symmetrical protonic environment.
11. Several combinations of protons and neutrons, of the same Z+N, may be stable.
12. Nuclei with symmetrical protonic shells, and cores, are the most stable, i.e., magic.

Aside, *I only define something as an atom if it has a 'central' neutron core.* By neutron, I mean the combination of a proton and an antiproton, *spinning around one another, relative* to an external proton. It follows that Hydrogen, Deuterium, and Tritium are not atoms at all. Hydrogen is an elementary particle, a nuclear component, and given its abundance and chemical involvement as molecular Hydrogen, acceptably defined as an element.

## 4.0 Atomic Structure:

## 4.1 Molecular Hydrogen:

In the Fundamental Theory, the internal spin(s) of elementary particles is not subject to uncertainty. The proton's positronic component always spins clockwise while the electron's internal spin is always counter-clockwise, which represents their positive and negative charge. Flipping the proton, or the electron, always gives the antiparticle of each. An interesting consequence is that neutral particle systems composed of equal and opposite parts always yields two parts with opposite internal spin, which violates the uncertainty principle of quantum mechanics.

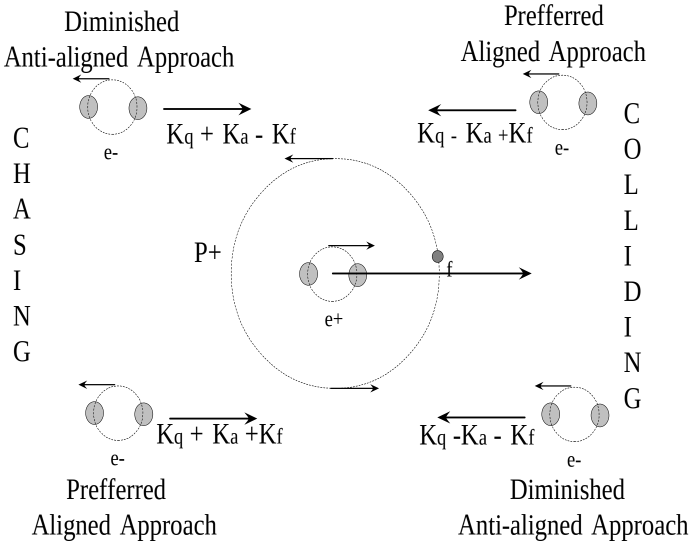


**Figure 8:** A depiction of the four possible approaches of electrons interacting with a moving proton.

There is, however, a degree of uncertainty in which direction an electron will approach, rather, pass a proton. In a relative manner, an electron must either chase or collide with a moving proton. In either case, the quantum component of the orbit is achieved relative to the proton, regardless of how fast the system is moving. Given the internal spin of the proton, the motion of the electron in orbit will be either aligned with or anti-aligned with the proton's fundamental spin. I call these the preferred and diminished states, respectively. In theory a preferred orbit should have a kinetic energy Kq+Kf, where Kq is the quantum contribution of kinetic energy, and Kf is the amount of additional kinetic energy caused by the motion of the fundamental. Similarly, a diminished orbit has Kq-Kf', where Kf' is the amount of kinetic energy lost due to the contrary motion of the proton's fundamental component. While the values of K and K' are similar, it is probable that a difference exists. The system as a whole should have a kinetic energy component of +Ka or -Ka, due to the ambient motion of the system, depending upon whether it was chasing or colliding with a moving proton. Uncertainty aside, electrons are more likely to achieve a preferred orbit, an aligned state, because the motion of the proton's fundamental represents a weak force of pressure, whose contrary motion interferes with diminished orbits. Similarly, there should be more chasing preferred orbits than colliding preferred orbits, because a moving proton also creates a weak field force that interferes with the colliding electrons.

## 4.2 Covalent bonds and Hydrogen bonding:

Unlike true nuclei where the electron orbits are focused to the outside of the nucleus in closed loop(s), the electron orbits of free protons should rotate around the proton in open loops.

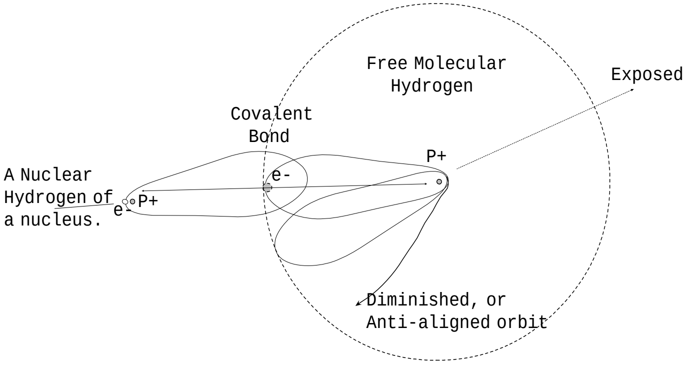


**Figure 9:** Top view of a C-H covalent bond, where only a protonic ligand of C, with a closed electron orbit is shown.

The rotation of charge around $H^o$ means that it forms covalent bonds of intermittent duration and strength. Recognizing this should help us to better understand the phenomenon of conjugate acids and bases, and the ability of molecular hydrogen to migrate, to associate with lone pair electrons on other molecules. During that phase, when electrons around molecular Hydrogen are between it and the nuclide it is covalently bound to, a temporary covalent bond is formed. At the same time, this creates a polarity, because molecular Hydrogen's proton now shields the electron, leaving the proton of molecular Hydrogen exposed to the external environment.

This gives molecular Hydrogen two very important chemical features. First, the exposed proton of 'bound' molecular Hydrogen, are attracted to the oscillating presence of a single external electron on the outside of a nuclear $H_2$ lone pair system, of other nuclides, which explains 'hydrogen bonding'.

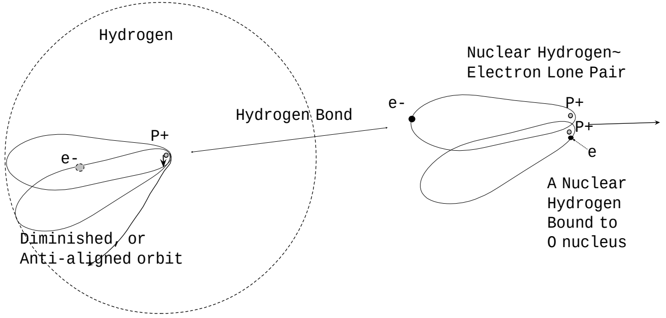


**Figure 10:** Top view of Hydrogen bonding, between molecular H and a lone pair of Oxygen, where only the lone pair of oxygen is shown.

Second, the rotating field of charge around molecular Hydrogen allows it to form intermittent alternating covalent bonds between two nuclides. For instance, it is able to form $FHF^-$ molecules, where Hydrogen bridges two Fluorine atoms. The same type of coordination occurs in solids creating alloys. For instance, the solid $BeH_2\rceil^{2-}$ consists of central Beryllium atoms bound tetrahedral, where each of four H is shared –bridged between two Beryllium atoms in the tetrahedral matrix. Certainly, it can be appreciated that this approach explains how adding molecular Hydrogen to metals, displaces rigid covalent bonds, allowing for the creation of flexible metal alloys.

## 4.3 Diatomic Molecular $H_2$:

### 4.3.1 Preferred and Diminished:

To recap, Hydrogen can have one of two electron states, called the preferred or diminished. In each case, an electron can acquire either a preferred or diminished orbit around a proton, but the preferred state should dominate, due to weak field interference.

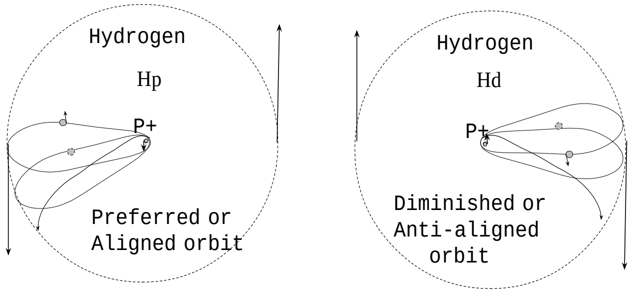


**Figure 11:** A depiction of the aligned and anti-aligned electron ground states, n=1, of molecular H

Free Hydrogen is unique because the charge of Hydrogen rotates around the proton in open loops.

### 4.3.2 Bonding states

To recap, the rotation of charge around Hydrogen means that it forms intermittent bonds. A H-H covalent bond requires both electron densities to be between the protons of each H, which is the bonding state. In each case, only one electron is allowed between the two protons of the bond at any given time, which creates the covalent bond.

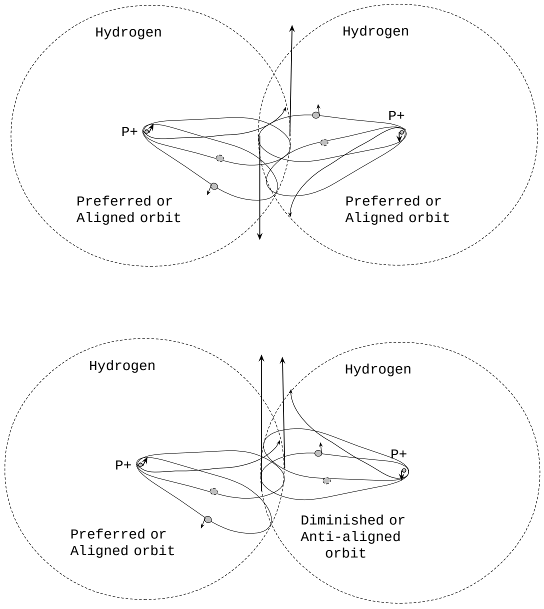


**Figure 12:** A depiction of the two most common types of $H_2$, in the bonding state.

A bond is created by intermittent electron bridge between two protons, mutual attraction for the same electron, from each nuclear H, as each electron, alternately passes between the two. In all cases the charge alignment is a fluctuating net (+)( -)(+).

### 4.3.3 Anti Bonding states

Due to the rotating nature of the electrons, when both electrons reach the alternate sides, they expose the two repulsive protons, creating an anti-bonding state.

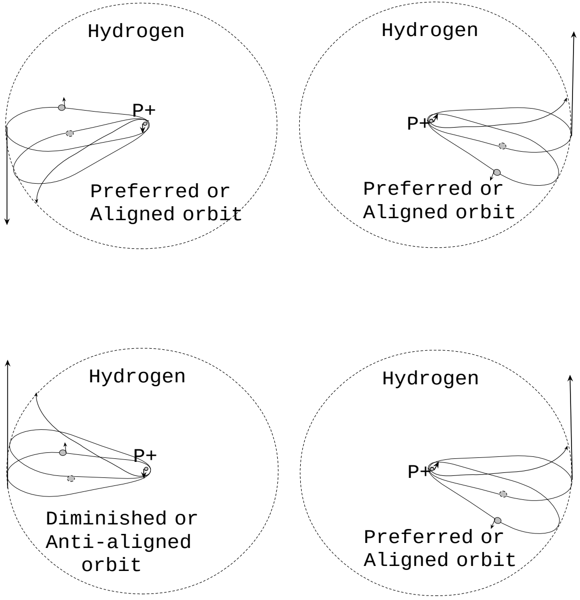


**Figure 13:** A depiction of the two most common forms of $H_2$ in their anti-bonding state.

There are other configurations to consider, other types of bonds to consider, including diminished-diminished, but these are rare.

### 4.3.4 Ortho and Para Hydrogen:

To confuse matters, Hydrogen is supposed to exist naturally in two forms, Ortho at 75% and Para at 25%. The question is whether this ratio pertains to H, or $H_2$? Understand that $H_2$ only forms intermittent covalent bonds, and that the test to determine this ratio, may actually be measuring the ratio of Hp and Hd. Certainly the balance of either type of H or $H_2$ can be shifted. It is important to note that ortho hydrogen cannot be prepared in a pure state, which makes sense, if it is composed of both types of hydrogen. So it is entirely possible that the ratio pertains to the proportion of Hp to Hd.

The 3:1 ratio of ortho to para, in the natural state, may be explained if Hydrogen is naturally dominated by Hp, and the formation of $H_2$ requires a second Hydrogen to attach itself, creating $H_2$+, before the next electron is added to the system. For this to be true, there would have to be an equal likelihood that the next electron acquires a preferred or diminished orbit. Given the intermittent nature of molecular H-H bonds, it is more likely that the ortho and para determination pertains to individual Hydrogen with preferred and diminished electron states. This, at least, would explain how and why the 3:1 ratio exists in nature. That is not to say, that this ratio could not be manipulated.

### 4.4 Deuterium:

A neutron by itself has a half-life of approximately 12 minutes. Deuterium is supposed to consist of one neutron and one proton. It is stable with an abundance of 0.015%. The fundamental theory explains that a relatively 'stationary' proton has the ability to nucleonically stabilize the antiproton of the neutron, at least half of the time, as the neutron rotates. How then is deuterium stable if it has one side of a neutron exposed?

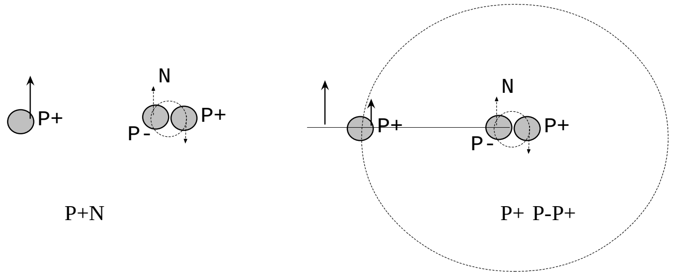


**Figure 14:** A depiction of a $P^+N^o$ on the left, and a Deuterium Particle on the right.

When a free proton and neutron interact along the electric field plane of their internal spin, the internal spin of the neutron itself creates a moving field of pressure, a weak field force that should cause the proton to orbit around the neutron, until its motion equates with that of the neutron's spin. A transition from $P^+N^o$ to an off center $P^+$ $P^-$ $P^+$ arrangement should result. The orbiting proton would then stabilize the antiproton at all times, and the spinning system would be stable as prescribed. However, once $D^+$ acquires an electron, via a collision, the motion of the protonic ligand should be dampened, the neutron should spin relative to the proton once again, intermittently exposing the antiproton to the surrounding environment.

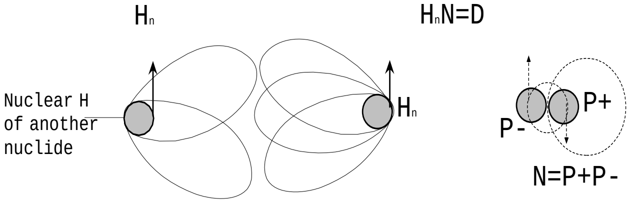


**Figure 15:** A depiction of a covalent bond between the ligand of one nucleus, and deuterium.

It follows that D° should be more susceptible to decay when covalently bound. When bound, deuterium's neutron should precess as it spins. It may even migrate. The question is whether the electron is capable of rotating around the protonic ligand, or if it is forced into closed loops. If it rotates, the spectrum of $D^o$ will be similar to H, eventually. At genesis, the primary electron will be shifted as it must collide with the moving ligand of $D^+$. The question is whether an electric arc causes the neutron to decay? It would be interesting to measure the quantity of Deuterium before and after an arc experiment…The interesting thing here is that if there is 0.015% deuterium, and given that Hydrogen is the most abundant element in the Universe, that there exists a natural source of energy, if we can manipulate deuterium in a cost effective manner into a $P+N^\circ$ configuration, rather than the more stable $P^+P^-P^+$ configuration. The inconsistent results of cold fusion may be related to the source of deuterium used in the experiments. Flipping either system over, gives the antiparticle of each, and the same but opposite results.

## 4.5 Tritium:

Bombarding Li6(3P+3N) with a N results in Tritium, T3(1P+2N), and He4(2P+2N). In order for this to occur, the colliding neutron must be striking Lithium's neutron core, ejecting not only the neutron that it strikes, but also the nuclear hydrogen that it is nucleonically bound to. In which case, the protonic ligand could maintain its nucleonic bond. T3 has a half life of 12.26 years, which means that it could decay in a second, or 200 years, or 2000 years, but on average half of the Tritium produced decays in 12.26 years. The question is under what conditions are these measurements made? Is it in a shielded environment, or an environment open to cosmic radiation, or even sunshine? What happens to this half-life when we expose Tritium to a torrent of particles?

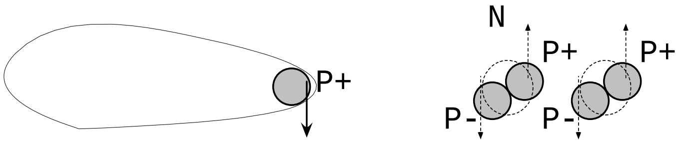


**Figure 16:** A depiction of a nucleonic bond in Tritium.

Putting this question aside, the question becomes: how does the deuterium fragment from Li6 and the colliding neutron resituate as they leave the collision site? It makes sense that the extra neutron will help to stabilize the original neutron in the $P^+N^\circ$ fragment to some extent. However, even if it forms a neutronic bond, a neutron would still be exposed to the external environment, and would only remain stable until disturbed by an asymmetrical field, most likely caused by another collision. The question is whether the proton is drawn to the region facing the two neutrons, pushed by the weak field spin of the neutron. If it were, it would be subjected to a greater pressure, oscillation, a double nucleonic bond.

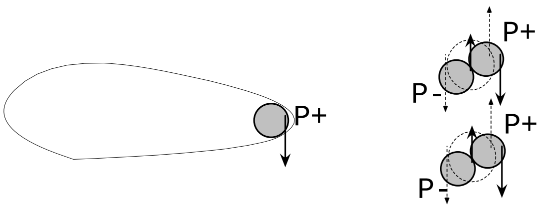


**Figure 17:** A depiction of a double nucleonic bond in Tritium.

This configuration might explain its longevity, as the antiprotons of each neutron would be stabilized, roughly ¾'s of the time, by a combination of nucleonic and neutronic stabilization. When T decays, it decays into $He3^+$ (2P+1N), which involves the B- decay of a neutron into a proton, with the release of an electron and neutrino. It is important to note that only one B- electron energy is observed, which suggests that only one neutron environment is decaying. It remains that either configuration, as depicted in figure 14 and 15, cannot be ruled out. The question is what happens when T is ionized? It is possible that Tritium's protonic ligand would start to orbit both neutrons, creating an asymmetry that might cause Tritium to decay more frequently.

## 4.6 Helium 3 and 4:

### 4.6.1 The Alpha Particles, Spinning Nuclei:

In order to appreciate Helium, we have to start with the alpha nucleus itself. In the case of Helium, the neutron core can consist of either one or two neutrons surrounded by two protonic ligands. The protonic ligands themselves will be as far apart from one another as possible due to their mutual repulsion, insulated by the neutrons of the core. This explains, naturally, why He3 is the only atom that has more protons than neutrons. The protons should situate opposite to individual neutrons, where the overall field pressure is less, creating a linear arrangement of protons and neutrons. As the neutrons spin internally, they attract and repel the protonic ligands. As a proton on one side is being attracted, the proton on the other side is being repelled. The system is not unlike a simple harmonic oscillator.

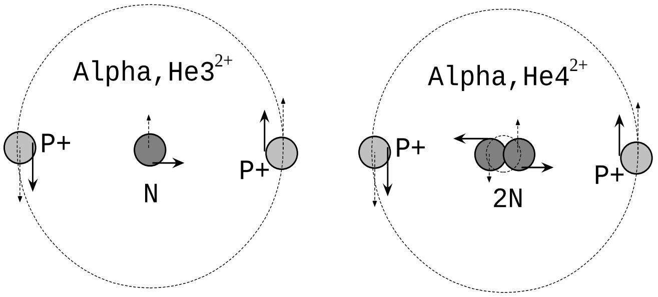


**Figure 18:** Top view of a spinning $He3^{2+}$ and $He4^{2+}$, alpha particles.

The counter clockwise spin of the neutrons should create a field force of pressure that pushes the protonic ligands in a counter clockwise orbit, while the clockwise spin of the proton should do the same to each neutron. It follows that an alpha particle, Helium without its electrons, is a spinning nucleus. The problem with alpha particles is that they are not unlike a propeller blade, destructive over a short range, which damage molecular bonds during collision, stripping away electrons.

Bohr failed to explain the spectrum of neutral Helium, which has two electrons. I call this the 'Helium Barrier'. In theory, Helium's spectrum should be Bohr-like, except that each quantum orbit should be complicated by the speed of the particle, and moreover, by the internal spin of the alpha particle. The problem is that the first electron acquired by the alpha particle will be shifted different from the second. This creates two electron environments, ortho and para, which are physically separated from one another. It follows, naturally, that each Helium should have two 'non-mixable' spectrums associated with it -which it does. This may explain why Bohr's more static model of Hydrogen did not succeed in the case of Helium.

In this model, Helium is inert, not because it has a lone pair, but because the ground state energies of Helium's electrons are massively shifted because of the initial motion of the spinning nuclei. This alone, might explain why Helium is noble. Remember, for a stable covalent bond to form, the electrons orbiting the protons involved in the bond need to be similar in orbital speed, with opposite orbital spin, so that each electron spends an equal amount of time, roughly alone, between the two protons, at any given time. It is also important to note that natural Helium is not a diatomic gas.

### 4.6.2 Helium Isotopes:

In order to form He5 we would have to strip one proton from Li6, or add one neutron to He4. In either case, the protons would move or remain as far apart due to mutual repulsion, making a bent structure improbable. No matter which way we arrange 2 protons around 3 neutrons an asymmetrical environment always results. In the first scenario, one neutron is unbound and exposed. Even if one proton were to arrange in a double nucleonic bond, with twice the pressure, the unbalanced oscillation of this system would cause the nucleus to decay almost instantly. It is impossible to keep He 5 stable.

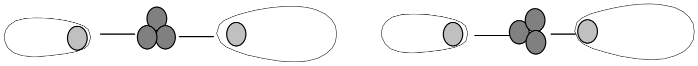
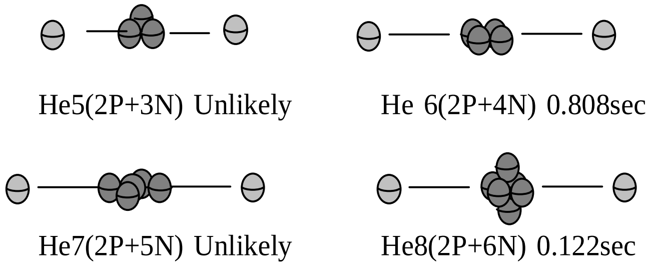


**Figure 19:** Top view of two potential configurations of He 5.

If He 5 is impossible to maintain for any given amount of time, how do we manufacture He 6? If we form He 6 from He 4, we would have to add two neutrons almost simultaneously. If, however, we were to strip a proton from Li 7, there would be two distinct neutron environments subject to decay. In the case of He 6, however, only one high-energy electron is reported during its decay, which involves the decay of a neutron. This suggests that only one neutron environment exists in the core, or that only one neutron is subject to immediate decay upon formation. This is consistent with a square planar arrangement of 4 neutrons. It makes sense that this configuration would last long enough to be observed, because the symmetrical protonic shell would shield the symmetrical core to some extent.



He5(2P+3N) Unlikely He 6(2P+4N) 0.808sec

He7(2P+5N) Unlikely He8(2P+6N) 0.122sec

**Figure 20:** A representation of the possible structures of four unstable isotopes of Helium, with decay ½ lives**.**

In theory, we have approximately .808seconds to add another neutron to He6, in order to form He7. Regardless, it is virtually impossible for another neutron to arrange in a symmetrical manner that is shielded to any extent by the two valence protons. Adding another neutron to He6 would cause it to decay instantly. In the case of He8, we could strip away four protons from C12, or 3 protons from B11. If we were to strip 3 protons from B11, its uncondensed trigonal bipyramidal core would have to condense, shift, into a 6N tetrahedral core. If this is possible, Helium 8 could be observable. It would definitely be more stable than Heium 7, because the symmetrical 6N core would be partially shielded by symmetrically placed protons, a symmetrical, partially shielded nucleus overall. The question is whether the remaining two protons are axial, rather than planar as shown? That is an interesting point! Is it possible to apply an external pressure, in a strong magnetic field, which allows the protons of Helium 3 and 4 to shift onto the axis?

### 4.7 Lithium 6 and 7:

In the case of a Li 5 nuclide, one additional neutron is required to compliment, bind, a third proton. In this case, two of the protons oscillate differently than the third. A proton would probably be ejected leaving He 4. It follows that ***there is no stable nuclide with mass 5.***

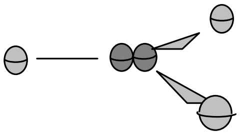


**Figure 21:** A representation of the unstable Li 5 isotope.

Li 6, however, is stable in a trigonal form, nucleonic equivalence occurs, and the symmetry of the core and proton shell corresponds. It is also possible for four neutrons to compliment a trigonal protonic shell, if they are arranged in an uncondensed state, which explains Li7. It is possible that these two systems remain fully trigonal in their metal state. It is possible that the formation of a covalent bond with a larger atom could force the formation of nuclear $H_{2}$. In theory, Li 6 may be more malleable than Li 7, because it has an uncondensed neutron core, and thus more flexibility. It would be interesting to compare the physical properties of these two nuclides, including their melting temperatures.

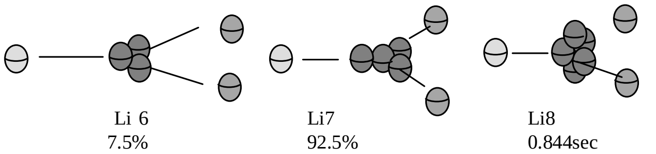


**Figure 22:** A representation of the trigonal structure of Lithium.

In Li 8, a 5N core would be forced into a condensed trigonal bipyramid. In which case, a symmetrical protonic shell would not be able to shield either of the two axial neutrons, one type of neutron would decay into a proton, and the entire nucleus would split into two alpha 4 nuclei. First, consider that if Be8 were composed of a random mixture of protons and neutrons, what logic would we use to explain how it always decays equally into two alpha nuclei, given that all we have to work with is a theoretical strong force? In this model, four protons in the square plane will repel one another and distort tetrahedral, distorting the 4N core as well.

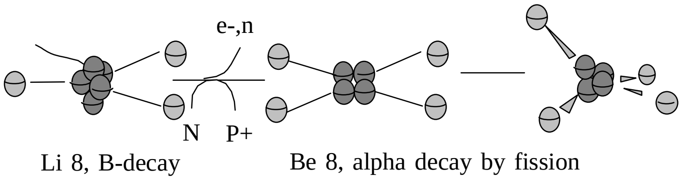


**Figure 23:** Tetrahedral distortion of Beryllium 8 results in fission.

As the two neutrons on the top and the two neutrons on the bottom condense, a magnetic overlap of protons of one neutron on top, and the antiproton of another on the bottom occurs. The problem is that the internal spin of a proton, is contrary to that of an antiproton, and when superimposed upon the same axis, the contrary motion of their spinning magnetic fields results in magnetic repulsion. Remember, charge is only relative in the electric field plane. The neutron core is forced to divide, resulting in a homogeneous split of Be8 into two He4 nuclei. The force is electromagnetic in nature. **Again, no nuclides of mass 8 exists.**

## 4.8 Beryllium 9:

In the case of $BeH_2$, the idea that it exists in a monomeric linear form is a requirement of the electron shell model, which requires two s electrons to be segregated in the lowest orbital, in order to qualify the interaction of electrons later in that system, starting at Boron. Further, the idea that it binds $Be^{2+}$ is required by the periodic table, which attempts to place elements with similar properties in the same row. Beryllium, however, is unique. In this model, Beryllium has four protonic ligands, which will tend to remain as far apart from one another as possible, making a square planar configuration unlikely. The protonic shell should distort naturally into a tetrahedral configuration. An uncondensed *5N core, is the only stable core*, capable of complimenting a tetrahedral protonic shell.

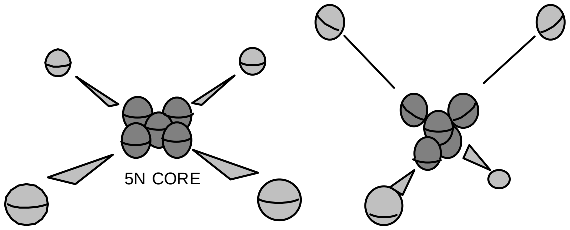


**Figure 24:** Be9(4P+5N) 100%: (a)Square Planar (b)Tetrahedral

In theory, Beryllium has the ability to form four covalent bonds. In this model, the metal should consist of a highly organized tetrahedral matrix, where each Beryllium is neatly, covalently bound, to another beryllium. It follows that Beryllium is a strong metal, of practical importance, which is practically immune to corrosion. In the case of $BeH_2$ -solid, the same tetrahedral matrix would result, except that Hydrogen would form a covalent bridge between each Beryllium. The larger the halides are that combine with Beryllium, the less number of bonds they will be able to form, because of the small size of Beryllium. In the solid, the halides may only form two bonds with each Beryllium, leaving two unpaired electrons, two unbound nuclear Hydrogen, by structural interference.

Beryllium should be able to absorb neutrons, slow moving neutrons, rather well. Beryllium 10, which lasts on average around 1.6 x$10^9$ years, should have a condensed 6N core, which is extremely stable. The tetrahedral protonic shell would shield this core rather well. I would expect, however, that chemical bonds with large halides could force a linear arrangement, which would expose Be10's axial neutrons to decay-which might cause its half-life to diminish significantly, even abruptly.

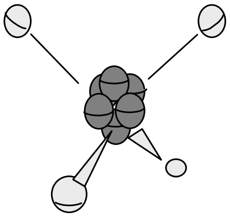


**Figure 25:** A representation of the semi stable Be 10 nucleus, pseudo carbon, poison.

Both Be 9 and Be 10 are pseudo carbon, which should make them extremely toxic.

## 4.9 Boron 10 and 11:

The accumulation of protons will eventually force protons to arrange above and below the nucleus along the magnetic axis of the neutron core. These 'helionic' protons will be closer to the core, and will serve to shield and thus stabilize the axial neutrons. In their most symmetrical state, B10 and B11 should have three valence protons arranged trigonal planar. Subsequently, Boron should have the immediate ability to form three covalent bonds on the trigonal plane, $BX_3$.

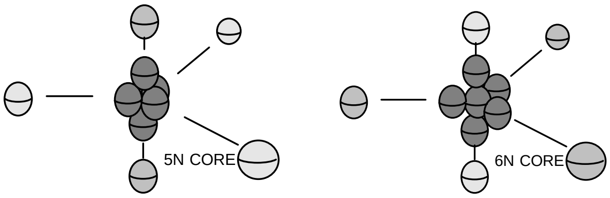


**Figure 26:** A representation of B10 (19.8%) and B11(80.2%) in trigonal bipyramidal form.

In Boron, the 'helionic protons' are relatively exposed. The electron orbits are similar to molecular Hydrogen, involving the rotation of charge around the axis in open loops. This allows these electrons to form unique, intermittent, side-to-side π bonding between similar atoms. This explains the double bond 'character' of B-X covalent bonds, whose bond lengths are shorter than expected for single bonds. The difference between this model and the classical model, is that a π bond is the intermittent sharing of 'two' axial electrons, one above and one below, with other similar systems. In contrast, modern science suggests that a single electron's density is inexplicably divided above and below the bond, through a contradictory node. This type of interaction would allow Boron to form double bond hydrides like $B_2H_2$, and I would also expect π bonds to tip Boron-Boron alignments, allowing for spherical molecular structures.

## 4.10 The Octahedral Core:

It is possible for the 6N trigonal bipyramid core to condense into a 6N 'octahedral core', which is more stable. This would allow B11 to form partial tetrahedral complexes. The same cannot be said of B10, and it should be easy enough to make this determination.

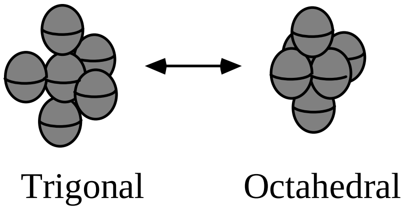


**Figure 27:** A depiction of neutron condensation. An uncondensed trigonal bipyramid neutron core will eventually condense into a condensed, and very stable 6N octahedral core, which represents a closed shell of neutrons.

Once the octahedral core is established, the protonic shell geometries should shift from a trigonal logic (trigonal planar, trigonal bipyramidal) to tetrahedral logic (cube, tetrahedron, octahedron, etc). The helionic protons should remain above and below the core, aligned with the magnetic axis.

## 5.0 The First Row Tetrahedral Elements:

### 5.1 Carbon:

The octahedral 6N core would compliment an octahedral or tetrahedral protonic shell. A tetrahedral arrangement will minimize proton/electron repulsion. The presence of and rotation of helionic charge should also minimize proton-proton repulsion via intermittent electron bridging/shielding.

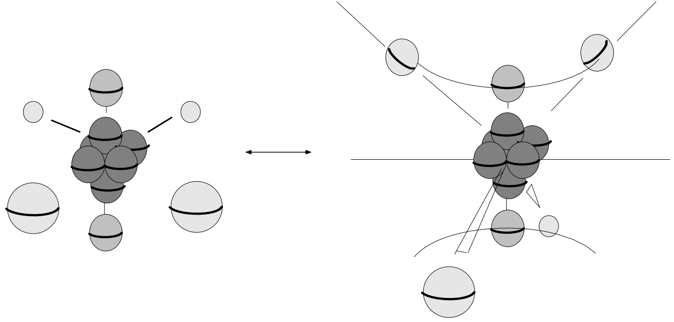


**Figure 28:** Square planar and tetrahedral configurations of C12.

In the tetrahedral form, each valence proton's electric plane will align with the net electric field of the three neutrons of the corresponding octahedral face. The electric field above and below the plane of the nucleus takes on an hourglass shape.

### 5.2 Nucleonic Shielding:

Carbon's tetrahedral protonic shell shields four shell positions of the 6N core. An extra neutron can remain stable, creating C13, if it is in a shielded position, because it distorts the protonic shell in a symmetrical manner.

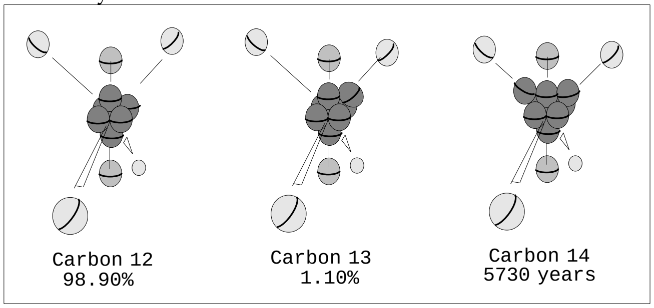


**Figure 29:** Three nuclides of Carbon.

C14 has a symmetrical neutron core. Its half-life of approximately 5730 years indicates that it is not in a hurry to change into N14, which is asymmetrical. C15 would decay, because a third neutron, even in a shielded position, would create an asymmetrical neutron core consisting of 3 unbound neutrons.

### 5.3 The Noble State:

There are 8 valence shell positions on the octahedral faces of the 6N core. Only those extra neutrons, which situate in shielded positions, are potentially stable. Naturally, additional protons will be drawn by the strong force of shielded outer valence neutrons. Additional nuclear protons that are drawn to shielded positions will be forced into close proximity to an existing protonic ligand.

It makes sense, therefore, that nuclear hydrogen will minimize their repulsion by forming a nuclear covalent bond-nuclear $H_2$ -*a lone pair*. This logic suggests that the four covalent bonding sites of carbon are depleted and rendered inert by lone pair formation, periodically, until we reach Neon's inert tetrahedral protonic valence of four lone pairs -a noble gas state.

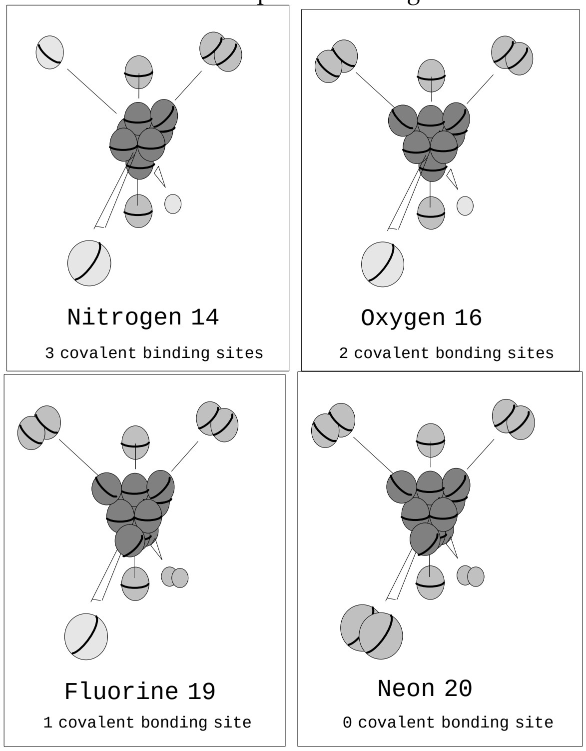


**Figure 30:** The tetrahedral configuration of elements N-Ne.

In general, the accumulation of neutrons within the core will pull the protonic shell inward and thus the electronic shroud of the atom as a whole. It makes sense; therefore, that the radius of Carbon will be the greatest, and that this should diminish as we proceed to Neon. Chemically, the shapes of $CH_4$, $NH_3$, $H_20$ and HF appear to be dissimilar. For instance, Fluorine forms a linear hydride and Oxygen forms a bent one. It is only after we measure the angles of their hydrides that we can infer the tetrahedral arrangement and the distorting presence of 'lone pairs'. Simply the presence of electron rich lone pairs will push the remaining ligands closer together, which will cause the tetrahedral angle to diminish gradually from Carbon to Oxygen –which is observed. Carbon, Nitrogen, and Oxygen, are similar in size and dimension, which allows them to interact rather easily. When they form compounds like $CH_4$, $H_20$, and $NH_3$, the Hydrogen align within the electric field plane of the protonic ligand that it binds with. In each case, the size of the binding atom will increase the bond angles. In addition to single bonds, C, N, and O can form double bonds if the protonic valence shifts to an octahedral configuration. In each case, the overlap of helionic electrons creates weak side-side $\pi$ bonds. C and N can also form triple bonds. It is interesting to note that C13, C14, N14, N15, O16, O17, O18, F19, Ne21, and Ne22 have two isomeric forms each. Those that I show are top isomers, but it is just as possible for the neutrons to arrange on the bottom of the neutron core, which would shift the lone pairs to the bottom, giving a bottom isomer. Tetrahedral C12 and Ne20 have full symmetry and are thus not chiral. It would be interesting to see if we could separate nuclear isomers, which might help in atomic circuits.

## 5.4 Nuclear Stability:

C14 is relatively stable, even though it has two excess neutrons, because these are symmetrically placed, and shielded. The only problem is that the two extra neutrons pull the top protonic ligands inward, which distorts the symmetry of the protonic shell, which creates a force. In theory, C14 is stable if left alone. I suspect, however, that double bonds may affect its half-life. In all likelihood, a penetrating collision is probably required to knock one of the excess neutrons from their shielded position, before decay can occur. Subjecting C14 to a torrent of particles should cause its half-life to diminish significantly.

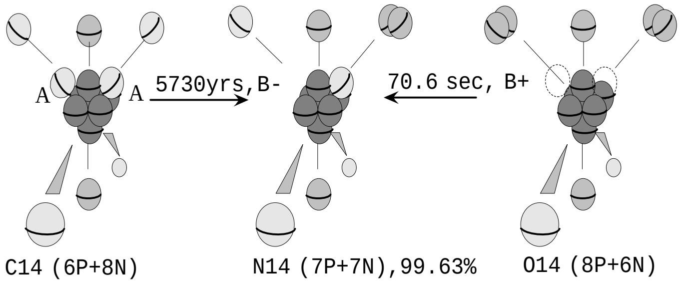


**Figure 31:** A representation of the decay series of nuclides of mass 14.

In the case of N14, the symmetry of the core and protonic shell matches. The extra neutron is bound to the lone pair, and its presence distorts the protonic shell symmetrically, while the lone pair reduces protonic repulsion within that shell, so it remains stable. As a general rule, however, after the 6N core is established, an even number of neutrons in shielded positions usually provides the neutron core with a symmetrically balanced electromagnetic environment. O14 has a stable 6N core, so neutron decay, B- decay, will not occur. However, it is missing two neutrons required to stabilize two lone pairs (the location of missing neutrons required to stabilize this nuclide are shown in dotted lines).

O15, is also missing a neutron required to stabilize a lone pair, the lone pair would collapse, B+ decay would occur, with the formation of a neutron. C15 is unstable because its extra neutron will create an asymmetrical neutron environment, no matter where the 3rd excess valence neutron goes.

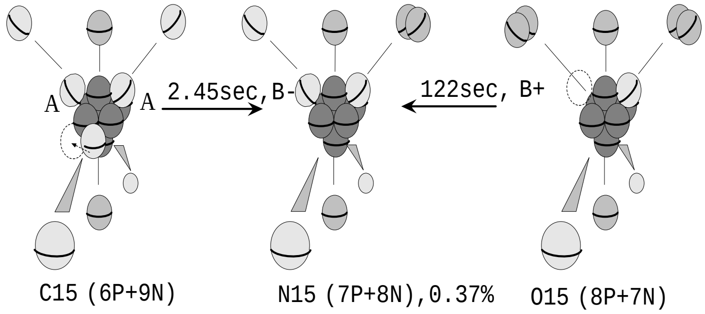


**Figure 32:** A representation of the decay series of nuclides of mass 15.

N 15 remains stable because its neutron core is symmetrical, and its extra neutron is shielded. There is however, an unusual distortion in the protonic shell.

N16's is unstable because no matter where the extra neutron goes it is subjected to an asymmetrical environment. O16 is extremely stable, magic, because its two outer neutrons are bound to lone pairs, and both its shell and core are symmetrical overall. In addition, O16 has two nuclear $H_2$ lone pairs in its protonic valence, which minimizes proton-proton repulsion.

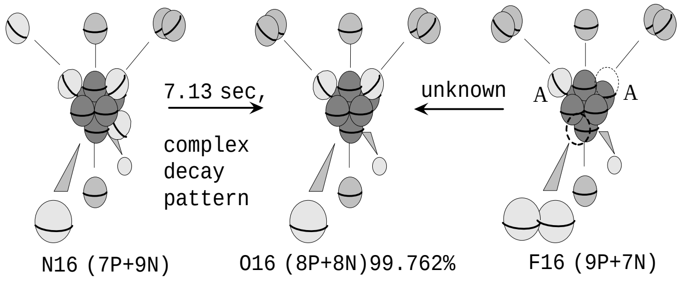
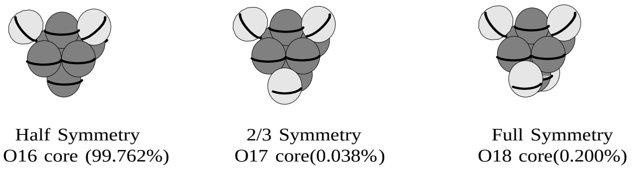


**Figure 33:** A representation of the decay series of nuclides of mass 16.

F16 would have only one bound neutron in its outer shell, so B- will not occur. F16 cannot be formed for any perceivable length of time because it is missing two neutrons required to stabilize two of its lone pairs, and has asymmetry in both its core and shell that do not match. O17(9N) is less abundant than O18(10N) because 2 neutrons provide O18 with more symmetry and thus stability. The 10N core has full symmetry, and represents a degenerate state, but not a closed shell.


Half Symmetry
O16 core (99.762%)

2/3 Symmetry
O17 core(0.038%)

Full Symmetry
O18 core(0.200%)

**Figure 34**: A representation of the three stable neutron cores of Oxygen.

O17(9N) is stable because it has a symmetrical protonic shield, which allows the unbound neutron to situate symmetrically between the two lone pairs in a shielded position. The other two neutrons in the valence shell are bound and stable.

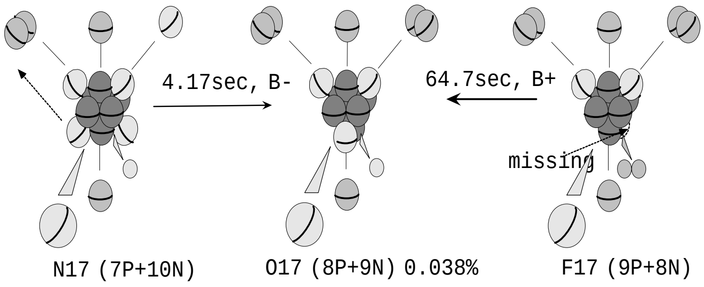


**Figure 35:** A representation of the decay series of nuclides of mass 17:

All of the neutrons in F17's neutron core are bound and stable, but it lacks the neutron necessary to stabilize its 3rd lone pair. The lone pair will collapse, and B+ decay will occur. A neutron will form, yielding O17.

I guess I should point out that the configurations shown are the most stable configurations possible overall, and that there are many other configurations, unstable neutron core configurations, that will lead to decay.

Only the configuration of O18 shown below is stable. It has a symmetrical protonic shell, which allows the extra neutrons to complete a symmetrical tetrahedral configuration, a degenerate shell of neutrons that is shielded by the existing protonic shell.

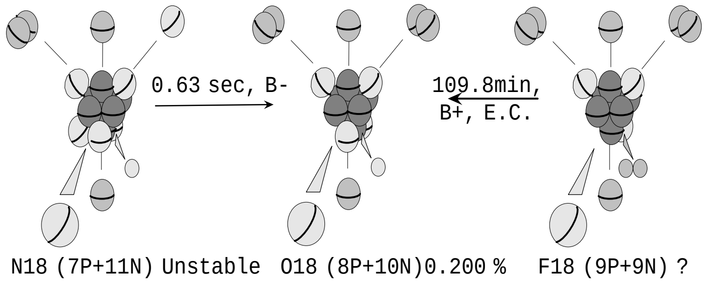


**Figure 36:** A representation of the decay series of nuclides of mass 18.

N18 has an asymmetrical protonic shell. The configuration shown is the only one capable of lasting long enough to be observed. The 5th shell neutron must situate in an unshielded, asymmetrical position, making it the most vulnerable to B- decay. All of the neutrons in F18, the one shown, are bound and shielded, but the system is asymmetrical. The question is: how do we form F18? If we strip a neutron from F19, at least this would explain the presence of both B+ and E.C. , where B+ only occurs when a neutron required to stabilize a lone pair is absent, and E.C. occurs when a protonic ligand is missing a neutron required to bind it. Consider F19, which has an asymmetric protonic shell, but an extremely stable 10N core. If you strip a neutron from F19, which one will it be? If you take the one that binds the third lone pair, you will get B+ decay. If you strike the excess one, which is paired, you may disrupt the proton ligand, which would lead to E.C. The existence of E.C. suggests that the configuration of F18 shown requires an additional neutron to keep it stable, but is that necessarily the case? Is it possible that we could form F18, in the configuration shown, by adding a neutron to O17? One would think that adding a neutron to O17 would automatically result in the formation of O18, but that may be the case. Certainly, there are several possible outcomes depending upon where the extra neutron strikes the core, where it bounces to, and where it eventually settles. If it settles in an asymmetrical position, B- decay could occur. If F18 is capable of remaining stable, less than 1/1372 strikes on O17 could even hope of forming it.

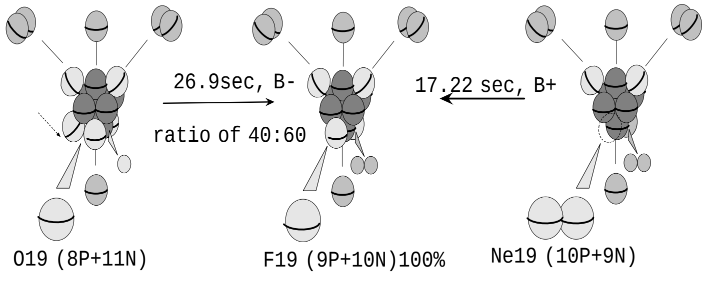


**Figure 37:** A representation of the decay series of nuclides of mass 19.

Even the most stable configuration of 019, shown above, would have to have an asymmetrically placed neutron in an unshielded position. In forming O19 from O18, there is no guarantee where an additional neutron will strike the core, which complicates the observed ratio of B- decay. The neutrons in Ne19's core are bound and stable, but it requires one more neutron to stabilize its fourth lone pair. The lone pair collapses, and B+ decay occurs.

## 5.5 The Square biplane Interruption:

First, consider the three stable nuclides of Neon in tetrahedral form. If we were to continue to add neutrons to Neon 20 in a tetrahedral manner, we would have exposed neutrons in both noble Ne21, and noble Ne22. So according to the model, and the basic rules of symmetry, *noble Ne21 and 22 would be unstable in a tetrahedral configuration*.

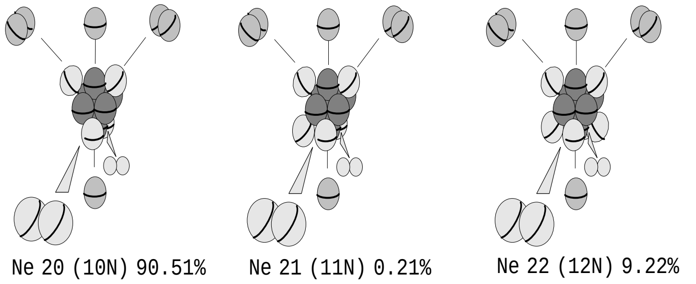


**Figure 38:** Neon's three nuclides in a tetrahedral configuration.

By definition, protons minimize their repulsion of one another by forming lone pairs. It must be that this repulsion is diminished enough to allow Ne21 and Ne22 to exist in a square biplane configuration. The extra flow of space into the protonic lone pairs must allow the extra neutrons to occupy an uncondensed shielded position, which would explain the stability of these nuclides.

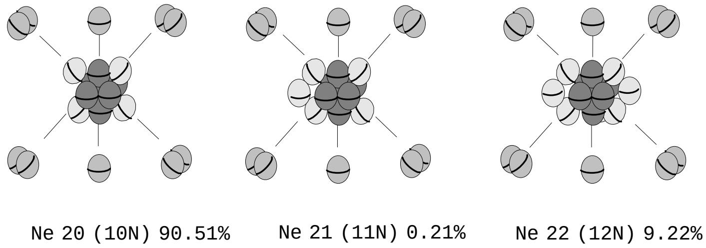


**Figure 39:** Neon's three stable nuclides in square biplane configuration.

The question is whether or not Ne20 exists in both configurations? Certainly, we require the square biplane configuration to produce stable Ne21 and Ne22 artificially. Ne20 tetrahedral would be completely different than Ne22 square biplane, and these differences should be notable in liquid form. In retrospect, the instability of F18 may be because it too exists in a square biplane configuration. If F19 exists in two configurations, however, the likelihood of a stable F18 would reduce by at least 2. The possibility exists that Ne22 can be made to be chemically active, if two of the lone pairs were to be forced apart, and its neutron core were to assume an octahedral configuration. In an octahedral form, it should be possible to form a number of Ne$X_n$ compounds, in different geometries.

## 6.0 The Magic Numbers:

Thus far, He4, C12, N14, O16, Ne20, Ne22 should all be relatively abundant in the Universe, because they have symmetry in both their cores and shells. Aside, the 2N core of He4 is stable, and appears even more so because adding a neutron to this will never result in a stable nuclide. Certainly, it is easier to dislodge a neutron from an uncondensed core, as is the case with Ne22 square biplane, so Ne 22 could never be considered to be magic.

Fully condensed cores like 6N, 10N, and 14N are extremely stable and represent completed neutron shells. Condensed cores, with half symmetry are also quite stable, including 8N and 12N.

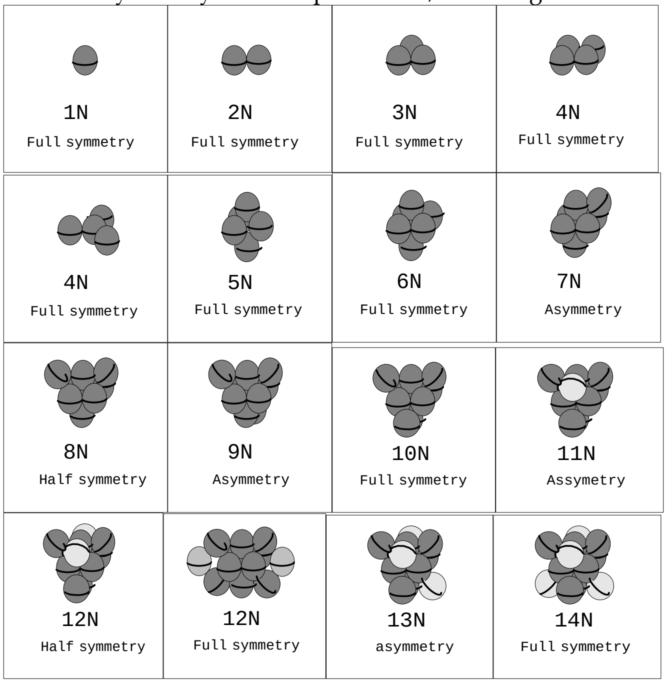


**Figure 40:** A representation of the most stable neutron core structures 1N to 14N.

The stability of the nucleus, however, also depends upon the protonic/ electronic shell. For instance, while C12 has full symmetry in both its core and shell, it has 4 repulsive protons. In contrast, Ne20, which also has full symmetry, has four lone pairs in its shell making it more stable during bombardment. The irony is that C12 will not be as strong as O16, which has half symmetry in its core and shell, because O16 has two lone pairs. C12 will be more abundant than N14, because N14 has an unusual symmetry.

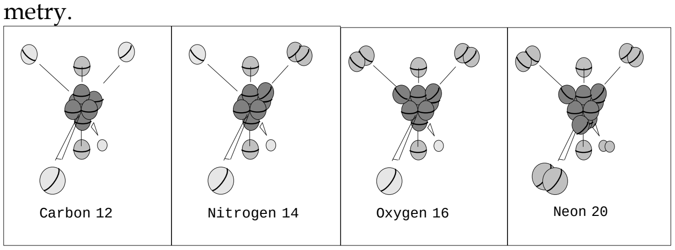


**Figure 41:** A representation of the tetrahedral configuration of four elements.

Experiments show that He4, O16, and Ne20, are more stable than any of the elements in row 2. The simple observation is made that nucleon totals (Z+N), which incorporate 2, 8, and 20 (in the selection of elements considered here) appear to be 'magic'. While it cannot be appreciated here, there are magic nuclei that do not fit into this simple number scheme, which in this model meet the structural requirements of 'magic' nuclei.

The phenomenon of magic numbers is important because it shows that there is an underlying logic that dictates which combination of protons and neutrons is more stable than another. It is quite possible that this is the first evidence for structured nuclei. Attempts have been made to incorporate the magic numbers into a nuclear shell model, similar to that used for electron shells, to explain the structure of the nucleus. From my perspective, however, the numbers themselves are simply a reflection, a coincidence, of the underlying structure of nuclei.

## 7.0 B- decay analysis of unstable nuclides:

When we add a neutron to a stable nuclide, it can create an asymmetrical environment, which destabilizes excess neutrons, even if they are in a shielded position. If and when a neutron decays, it will release a high energy B- electron. The energy of that electron will be related to its position, the number and type of neutrons around it in a given shell, whether those neutrons are paired with another neutron, or not paired, and in each case, the energy of the electron is less the energy required to escape the nucleus from that position on the neutron core. It follows that the energy of the electron that we observe is a signature of the environment that it came from, and that the ratio of different electron energies is a signature of the sum of all unstable configurations possible.

In the simple scheme of things, if we observe a 2:1 ratio of electrons released, or 66.66% of one energy and 33.33% of another, this is an indication that there are two excess, unbound neutrons in one environment, and 1 excess, unbound neutron in another. In order to appreciate the ratio, we have to consider every possible unstable configuration of the neutron core, which we have artificially produced. In addition to unbound neutrons, we have to consider bound and stable valence positions, which are defined by the protonic shell. It follows that we have the means to map out not only the structure of the neutron core, but also the ability to confirm the structure, if not the orientation of the protonic valence.

Statistically speaking, each neutron that we add to a stable nucleus has an equal probability of striking all of the outer neutron shell positions. For instance, in the case of the 6N core there are 8 outer positions, four in one environment on the top, and 4 on the bottom, differentiated by the magnetic axis or electric field plane of the nucleus. In the case of the 10N core, there are still 8 outer shell positions, except that 4 of the positions outside of the 6N core are occupied, which complicates matters. In order to reproduce the exact ratio, we are forced to consider which neutrons are bound to protons, which are usually stable and inert to decay, and those that are not.

Some of the valence positions of the core are occupied, and a neutron is knocked out of its position and replaced. The knocked neutron can go to a vacant position in the same valence, or even to another occupied position, at which point it can cause the occupied position neutron to decay, or if that one is bound and stable, it must again resituate. A knocked neutron, and only a knocked neutron, has the opportunity to be knocked to a higher energy valance position, but only if one exists. If the neutron strikes an open position, it can settle there and depending upon whether the position is shielded or not, whether it creates an asymmetrical neutron environment or not, it can cause other neutrons to decay, or it may decay all by itself.

When the structure of the nucleus is taken into consideration, as prescribed by this model, a correspondence is found between the empirically determined B- decay ratios, and those predicted by this analysis. Understand, that if we arbitrarily change the number of protons or neutrons in the nuclide we are considering, or fail to consider all possible unstable configurations, that we cannot reproduce the ratio.

In this brief I concentrate upon those unstable nuclei decays that produce a ratio of B- decay energies. It needs to be appreciated, however, that all of the unstable nuclei decays, where only one B- electron energy is observed, coincide with nuclear structures where only one neutron is subject to decay.

## 7.1 Li 9, B- Decay Analysis:

The early elements present us with a challenge, simply because their neutron cores are not condensed, and as such, outer neutron shell positions do not exist. However, uncondensed neutron cores are flexible, and adding a neutron should result, at least temporarily, in the most stable configuration possible. Consider Lithium 9, which has a half-life of just 0.178 seconds.

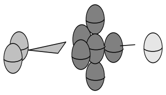
| Li9 unstable | Half Life | Decay Modes | Decay % | Particle Energy | Particle Intensity |
|---|---|---|---|---|---|
|  | 0.178 sec | B- | | 13.5 MeV | 75%(B) |
| | | B- | | 11 MeV | 25%(A) |
| | | n2a | 35% | (n)0.3 | 96 |

**Figure 42:** Theoretical structure of Li9 nucleus, labeling the various neutrons subject to B- decay, and partial decay data showing a 75:25 percent ratio of electrons emitted during B-decay.

In theory, the only configuration of Li9 (3P+6N), that could last long enough to be observed, should have an uncondensed trigonal bipyramid neutron core, as shown above.

If I am interpreting this data correctly, 96% of the time a neutron is ejected and the remaining system subsequently decays into 2 alpha particles. In order for this to occur, a neutron must decay, because we need one more proton to justify two alpha particles...

In the majority of cases, an unshielded axial neutrons should escape, and only one neutron energy would be observed -as the two axial neutrons are degenerate.

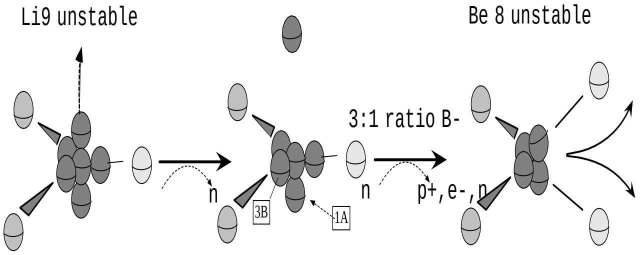


**Figure 43:** Theoretical structure of Li 9. A decay series, which yields two alpha particles.

The asymmetrical environment that results will cause any one of the three outer neutrons on the equator to decay, or the remaining axial neutron. The central neutron, which is shielded and stabilized by the three surrounding neutrons, is very unlikely to decay, and if it does, it would occur so infrequently as to go unnoticed. This means that we expect a well-defined 3:1 B- decay ratio, 75% to 25%, which is observed. When a neutron is ejected, and after B- decay occurs, the nucleus that remains consists of 4P+4N. The remaining nucleus, if intact, should undergo an internal transition to Beryllium 8, which should split into two alpha particles, two He4 nuclei.

## 7.2 C15, B- Decay Analysis:

Consider C15 (6P+9N), which lasts just 2.45 seconds. In the configuration shown, C15 has three additional 'excess' neutrons in shielded positions. Two of the 3 neutrons outside of the octahedral core of C15 are a symmetrical pair (AA, paired, type), while the third is not (B, unpaired, type). By 'paired', I mean that they are aligned within the same curved electric field plane, in this case, on the top of the nucleus. In theory, the two excess neutrons on the top of the nucleus pull in the two protons on the top of this nucleus. When the third neutron is added it pulls in and distorts the protonic shell, in an asymmetrical manner. In the simple scheme of things we would expect a $B^-$ decay ratio of approximately 2:1, which is very close to what is observed, because the three-shielded neutrons create their own asymmetrical environment and thus are equally subject to decay. Of course, this analysis pertains only to the configuration shown in the figure below, and we have to consider all possible unstable configurations.

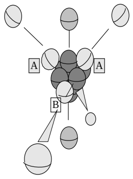
| C15 unstable | Half Life | Decay Modes | Decay % | Particle Energy | Particle Intensity |
|---|---|---|---|---|---|
|  | 2.45 sec | B- | 4% | 4.51 MeV | 68%(A) |
| | | | | 9.82 MeV | 32%(B) |

**Figure 44:** One configuration of C15 nucleus, labeling the two environments of neutrons subject to B- decay, and partial decay data showing a 68:32 percent ratio of electrons emitted during B-decay.

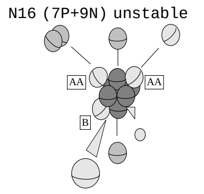
In the complex scheme of things, a neutron striking a relatively stable C14 will have 8 outer shell positions of the 6N core that it can hit equally. Unbound shielded neutrons occupy two of these positions, while six are empty. When a neutron strikes any of the 6 empty octahedral positions, it creates the asymmetrical environment necessary to decay any one of the three neutrons now on the outer shell of the 6N core. Of the 6/8 or 75% of events that are now being considered, we are guaranteed that 2/3 or 50% of the neutrons decaying will be paired neutrons of the AA type, and that 1/3 or 25% will be of the unpaired B type. 2/6 times a neutron strikes an occupied position. Again, there is an equal probability that any one of the three neutrons will decay, and we are guaranteed that 2/3 of these events, or 16.67% will lead to AA type decays. The remainder of events, 1/3, or 8.33% will involve a neutron that is ejected by its collision with an occupied position, which must resituate. It has 7 other octahedral positions that it can go to. One of these positions, however, is occupied. It follows that 6/7 times, a B position will be acquired, but 1/7 times the ejected neutron will again go to an occupied position. In which case, it is more probable that 1/7 times, that the AA type neutron will decay before the ejected neutron has time to resituate again. All positions being equal, this adds as follows:

| | | | | |
|---|---|---|---|---|
| 6/8 open | 75% | 50%AA | | 25%B |
| 2/8 occupied | 25% | 16.67%AA | | |
| *8.33% resituate to 7 positions* | | | | |
| *where* | (1/7) | 1.19%AA | (6/7) | 7.14%B |
| **Total** | **100%** | **67.86%AA** | | **32.14%B** |

This gives a ratio of 68% paired neutrons decaying to 32% unpaired neutrons decaying, which matches the empirical ratio.

## 7.3 N16, B- Decay Analysis:

In theory, N16 (7P+9N) would have the same neutron core as C15, and we might expect that it would present with a similar decay ratio-but it doesn't. The difference is that Nitrogen has an asymmetrical protonic shell, consisting of one lone pair, and three covalent bonding sites, in the same tetrahedral shell.



| Half Life | Decay Modes | Decay % | Particle Energy | Particle Intensity |
|---|---|---|---|---|
| 7.13 sec | B-,a<br>B-<br>a | | 4.27 MeV<br>10.44 MeV | 68%(AA)<br>26%(B) |

**Figure 45:** One configuration of the N16 nucleus is shown, labeling the various neutrons subject to B- decay, and partial decay data showing what could be a fragmented 2:1 B- decay ratio.

In order to create N16, we have to add another neutron to N15. Certainly, N15 is more stable, in a relative sense, than either C16 or O16. The asymmetrical protonic shell, created by the H2 lone pair, affects its overall stability. The neutron adjacent to the lone pair system is bound to the lone pair, while the adjacent lone pair adds stability by creating a symmetrical neutron core, but at the same time this symmetry does not match the protonic shell.

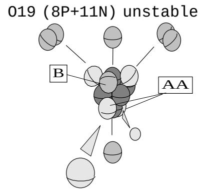
When we add another neutron to N15, it can strike any one of the 8 valence positions on the 6N core, of which two are occupied. 6/8 times a neutron hits an unoccupied position. It is reasonable to assume that the added asymmetry of the core is enough to cause either AA neutron to decay. This would guarantee a 50%AA type decay to 25% B type decay, as all three neutrons are subject to the same asymmetry and thus equally likely to decay. 1/8 times a neutron will collide with the neutron that is bound to the lone pair system. It follows that 1/8 times or 12.5% of the time that 2/3 AA type decays will again occur, but in this special case, that the rebounding or 'knocked' neutron might be captured by the lone pair, resulting in the formation of an alpha particle. The other 1/8 times, a neutron will strike the excess neutron position, which is not associated with the lone pair. Again, we are guaranteed that 2/3 times an AA type decay will be observed. This knocked neutron, however, must resituate, and all things being equal, it can reach an unoccupied position and decay, be caught by the lone pair to form an alpha particle, or the original A position might decay before it has time.

| | | | | |
|---|---|---|---|---|
| 6/8 open | 75% | 50%AA | 25%B | |
| 1/8 LP occupied | 12.5% | 8.33%AA | | 4.17% $\alpha$ |
| 1/8 occupied | 12.5% | 8.33%AA | | (4.17% *resituate)* |
| Resituated | | 1.39%AA | 1.39%B | 1.39%$\alpha$ |
| **Total** | **100%** | **68.05%AA: 26.39%B: 5.56%$\alpha$** | | |

This gives a 68% AA paired type decay, to 26% B unpaired type decay, to 6% alpha type decay, which matches the empirical ratio. Note that the alpha particles are **predicted to be He 3** nuclei, as only a single 'knocked' neutron is capable of being ejected and therein captured by the lone pair that it was already bound to.

## 7.4 O19, B- Decay Analysis:

First consider that Oxygen 18 is symmetrically balanced in both its neutron core, and its protonic shell. It is stable, because, even though O 18 has two excess neutrons, these are shielded and paired in a symmetrical environment. These shielded excess neutrons, which in the case of the top isomer are situated on the bottom of the neutron core, create a fully symmetrical and degenerate neutron core. It is reasonable that these need to be disrupted to make them decay. To make O19, we must add another neutron, which can strike any one of the 8 octahedral core positions.



| Half Life | Decay Modes | Decay % | Particle Energy | Particle Intensity |
|---|---|---|---|---|
| 26.9 sec | B- | | 3.25 MeV<br>4.60 MeV | 60%(AA)<br>40%(B) |

**Figure 46:** Theoretical structure of O19 nucleus, labeling the various neutrons subject to B- decay, and partial decay data showing a 3:2 ratio.

First, 4/8 times a neutron will strike an empty position, creating an asymmetrical neutron core, which should disrupt the shielded excess neutrons. It is equally likely that any one of the three excess neutrons, now in an asymmetrical environment, will decay. This leads to a standard **33.33%AA: 16.67%B/50** ratio. Second, strikes to the 2/8 shielded and bound neutrons will not cause them to decay, because they are bound, shielded, paired, and thus extremely stable. Further, strikes on these two positions will not immediately disrupt the 2 excess, shielded neutrons, but the neutron that is kicked out by the collision will have to resituate to one of the 7 remaining positions:

2/7 times→A 2° hit occurs on the unbound neutron position, which causes it to decay→7.14A/25

4/7 times→A 2°hit occurs on an open position, where it settles and decays only→14.29B/25

1/7 times→A 2°hit occurs on the remaining stable bound position , which must resituate again→3.57R

It follows that we need to repeat this process to see where the 3.57% of neutrons resituate:

2/7→Hit the unbound neutrons, which causes the unbound neutron to decay→1.02A/3.57

4/7→Hits an open position, where it settles and decays only→2.04B/3.57

1/7→Hits the remaining bound position, which means it must resituate again→0.51R

Again we need to consider the path of the remaining 0.51:

2/7→Hit the unbound neutrons, which cause the unbound neutrons to decay→0.146A/0.51

4/7→Hits an open position, which it settles and decays only→0.29B/0.51

1/7→Hits the remaining bound position, which resituates again→0.073R

After three cascades we can assume that the resituating neutron would decay, resulting in a decay series ratio of **8.31A : 16.69B/25**, which is a reasonable approximation.

Next, a neutron strike on a shielded unbound neutron will immediately disrupt the unbound neutrons. *There should be equal probability that the two unbound neutrons will decay, and/or the kicked neutron will decay.* So we might anticipate a 16.67A:8.33B/25 ratio. The problem is that the kicked neutron will have to resituate, and that it can cause the unbound neutrons to decay 'immediately' if they are struck after being disrupted. In the first part of this cascade:

4/7→Hits an open position, which means only the kicked neutron will decay→4.76B/8.33

1/7→Hits the remaining unbound position causing it to decay immediately→1.19A/8.33

2/7→Hit the bound positions, which means it must resituate→2.38R

It follows that 2.38% of the neutrons must resituate again. The positions that they can resituate now, however, have changed. There is now, only one bound position that can result in another cascade:

2/7→Hit the unbound position which causes it to decay→0.68A/2.38

4/7→Hits an open position, which causes it to decay→1.36B/2.38

1/7→Hits the remaining bound position, which resituates again→0.51R

Again, 0.51% of the neutrons must resituate:

2/7→Hit the unbound position which causes it to decay→.097A/0.51

4/7→Hits an open position, which causes it to decay→.194B/0.51

1/7→Hits the remaining bound position, which resituates again→0.049R

Again, we can assume that the kicked neutron will decay before a third cascade, which introduces negligible error. The end result is a decay series ratio of

**18.64A : 6.36B/25**

When we combine these three contributions we see that it matches the empirical ratio:

| | | | | |
|---|---|---|---|---|
| Empty strikes | 4/8 | 50% | 33.33A | 16.67B |
| Bound knocks | 2/8 | 25% | 8.31A | 16.69B |
| *Unbound knocks* | *2/8* | *25%* | *18.64* | *6.36B* |
| **Estimated ratio** | | | **60.28%A** | **39.72%B** |
| Empirical ratio | | | 60% | 40% |

It is important to realize that these results are only observed if enough results are gathered, allowing for sufficient time for the delayed decays to occur, and register in the data. In other words, the decay ratio approaches close to 60:40 over time.

## 7.5 F21, B- Decay Analysis:

Consider F21, which gives an unusual B- decay ratio of 8:63:29. What is unusual here is that the 12N core has only two extra neutrons outside of the stable 10N core. The question is: how do two excess neutrons give three different energy types? The answer is that there are three different neutron environments possible, and thus three different decay types, and thus three different electron energies possible, with three different intensities.

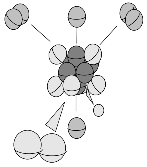
| F21 (9P+12N)unstable | Half Life | Decay Modes | Decay % | Particle Energy | Particle Intensity |
|---|---|---|---|---|---|
|  | 4.33 sec | B- | 100% | 3.7MeV<br>5.0MeV<br>5.4MeV | 8%<br>63%<br>29% |

**Figure 47:** One theoretical structure for the unstable F21 nucleus is shown, with partial decay data showing an unusual B- decay ratio.

If F19 is the precursor to F21, then according to our model we have an underlying 10N core, which is stable.

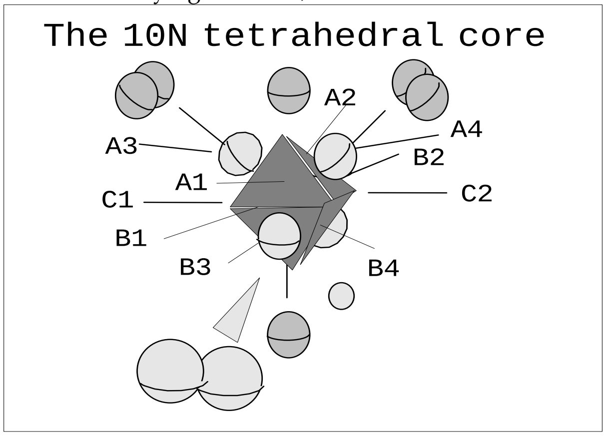


**Figure 48:** Theoretical structure of a 10N tetrahedral core, where the inner 6 neutron core is represented by an octahedron. This diagram labels the positions available to neutrons around the 6N core.

In order to obtain F21, we need to add **2 neutrons** to this core. Again, the 6N neutron core has 8 outer valence positions that can be struck. In theory, a neutron that collides with the 10N core, can acquire an empty position 4/8 or 50% of the time. The other 50%, it will collide with an occupied position. If the first extra neutron, or primary neutron, knocks a neutron in the shielded position, and settles in that position, it will not be subject to decay. The ejected neutrons (A3, A4, B3, or B4), however, will then be forced to resituate into one of the four open positions (A1, A2, B1, or B2). This gives the same result for a knock as it does for a no knock placement, because there are no excited shell positions that are immediately available. In other words, F20 only has one B-decay type.

We have, therefore, 4 different neutron cores to consider after the primary neutron has situated in an unshielded position:

[10N] A1, [10N]A2, [10N]B1, [10N]B2

Similarly, the 2° neutron can strike any one of the 8 octahedral faces of the 6N core. Now of the 8 octahedral positions, 3/8 or 37.5% are unoccupied positions, which will lead to a straightforward ratio of unshielded neutron decay:

| **A1A2** | **B1B2** | **A2A1** | **B2B1** |
|---|---|---|---|
| | **8 paired: 16 unpaired** | | |
| A1B1 | B1A1 | A2B1 | B2A1 |
| | or 1AA type: 2 A type | | |
| A1B2 | B1A2 | A2B2 | B2A2 |
| | or **12.5%AA: 25%B /37.5** | | |

A neutron can strike and replace a shielded neutron 4/8 times. I would argue that a collision must occur, before a neutron can be 'knocked up' to occupy a higher neutron shell position. In which case, the ejected neutron can resituate in any one of the three open faces or be knocked up to the uncondensed C position. This creates the following pattern: The 2°Hits [1°in position ,3° goes to]

| | | | |
|---|---|---|---|
| A3[A1,A2] | A3[A2A1] | A3[B1B2] | A3[B2B1] |
| A3[A1B1] | A3[A2B1] | A3[B1A1] | A3[B2A1] |
| A3[A1B2] | A3[A2B2] | A3[B1A2] | A3[B2A2] |
| or | 4x {8AA:20A:4C/32} | | |
| A3[A1C3] | A3[A2C4] | A3[B1C1] | A3[B2C2] |
| or | **12.5%AA:31.25%:6.25%C/50 Total** | | |

Now, consider what will happen when a 2° neutron strikes the unshielded neutron, a 1° in any of the four possible positions. In this case, the ejected 1° will still have the ability to take any one of the three open positions, or a C position. The difference is when it takes the C position. Consider that in all the other cases, there is an equal probability that the 1° will decay or the 3° will decay. In this case, however, the 2° just took the 1° position, which is then immediately shielded by the C placement. From a time perspective, it is more likely that the C neutron will decay before the 2° neutron, which it is now shielding ever does. It is not unreasonable, therefore, that it will give a ratio of:

8AA: 16A: 4C / 28 which becomes:
**3.57%AA: 7.14%A: 1.79%C /12.5**

When we add up the three different decay scenario's we get the following.

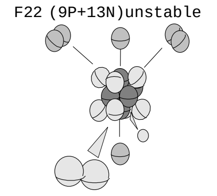
| | | | | |
|---|---|---|---|---|
| 3/8 no knocks | 12.5%AA: | 25%B | | /37.5 |
| 4/8 knock shielded | 12.5%AA: | 31.25%: | 6.25%C | /50 |
| 1/8 knocks unshielded | 3.57%AA: | 7.14%A: | 1.79%C | /12.5 |
| 8/8 Theoretical ratio | **28.57AA:** | **63.39A:** | **8.04C** | /100 |

This matches the observed empirical ratio of 29:63:8 for the B- decay of F21-perfectly.

The implications are that F19 exists in a tetrahedral configuration. If F19 existed in a square planar configuration, the results would not match the empirical ratio. It follows that collision analysis can also be used as a tool to confirm nuclear structures, when more than one possible configuration might exist.

## 7.6 F22, B- Decay Analysis:

Next we consider the B- decay ratio of F22 (9P+13N). In order to form F22 we would have to add ***3 neutrons*** to F19's stable 10N core. How is that even possible? I mean, F21 has a half life of just 4.33 seconds by itself!



| Half Life | Decay Modes | Decay % | Particle Energy | Particle Intensity |
|---|---|---|---|---|
| 4.23 sec | B- | 100% | 3.48MeV<br>4.67MeV<br>5.50MeV | 15%<br>7%<br>62% |

**Figure 49:** One theoretical structure for the F22 nucleus is shown, with partial decay data showing an unusual B- decay ratio.

In retrospect, and to the point, it seems reasonable that ***the only configuration of F21 capable of lasting long enough*** to add a third neutron would be the one with two paired unshielded neutrons.

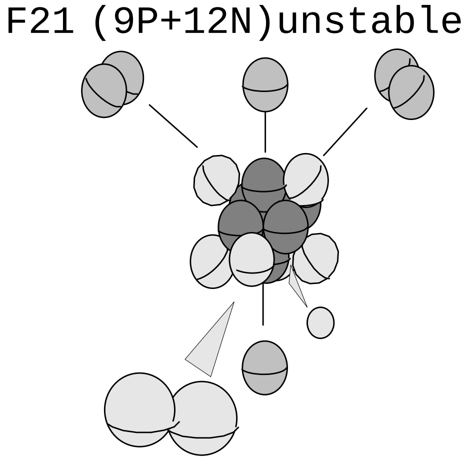


**Figure 50:** The most symmetrical configuration of unstable F21 (9P+12N)

This configuration, at least, is symmetrical. If I am correct, then we need only consider the collision of a neutron with this configuration, which has two paired unshielded neutrons. Again, a neutron can collide with any of the 8 faces of the 6N octahedral core, whether they are occupied or not. A neutron strike on an unoccupied position will yield a straight forward ratio of 2AA:1B 2/8 or 25% of the time. This means that we are guaranteed a ratio of

**16.67%AA: 8.33B/25**.

Now 4/8 or 50% of the time, a strike on a shielded neutron kicks and replaces that neutron, which does not decay because it is shielded and bound to the protonic valence. The way I approach this is to assign equal probability of decay to either of the unshielded neutrons, and the knocked neutron. The knocked neutron, however, must resituate to any one of the 7 remaining octahedral positions, whether occupied or not. The end result is that there is an equal probability that the resituating neutron will decay as an AA, B, or C neutron.

This creates a 2.33AA: 0.33B: 0.33C ratio.

AAR= 2A {0.333AA:0.333B:0.333C}
AAR= 2A {0.333AA:0.333B:0.333C}
AAR= 2A {0.333AA:0.333B:0.333C}
AAR= 2A {0.333AA:0.333B:0.333C}
9.332A: 1.332B :1.332C/ 11.996 .

Converted into percentage this is 7.79%A: 11.10%B:11.10%C. Out of 50 decays, this becomes approximately:

38.895AA: 5.55B: 5.55C/49.995

The problem is that .333/3, or 11.1% of the time a resituated AA decays. This means that 11.1% of the time a C will be ejected from its position (possibly from the nucleus) before B- decay occurs. This changes the ratio to:

**39.511AA: 5.55B: 4.934C/49.995**

Now consider that 2/8 or 25% of the time, an unshielded strike kicks and replaces that neutron. The replaced neutron can still decay because it is unshielded- unless the ejected neutron immediately shields it by occupying the C position on top of it. In this situation, the C neutron cannot be ejected, and we end up with less AA type neutron decays in the resituated neutron ratio, and more B, and C type neutrons. The ratio becomes:

1A: 2B:2C or 0.20A: 0.40B: 0.40C

The resituating neutron can go to:

| | |
|---|---|
| AA, | 2A |
| C | {0.125C} |
| C | {0.125C} |
| B | {0.125B} |
| B | {0.125B} |
| R | {0.025A: 0.05B: 0.05C} |
| R | {0.025A: 0.05B: 0.05C} |
| R | {0.025A: 0.05B: 0.05C} |
| ***A*** | ***{0.025A: 0.05B: 0.05C}*** |

2.10A: .45B: .45C /3
70.0%A: 15%B: 15%C/100
**17.5A: 3.75B: 3.75C/25**

When we total the three contributions we have a ratio that does not match the empirical:

| | | | | |
|---|---|---|---|---|
| 2/8 or 25% | 16.67A: | 8.33B | | /25. |
| 4/8 or 50% | 39.511A: | 5.55B: | 4.934C | /49.995 |
| 2/8 or 25% | 17.5A: | 3.75B: | 3.75C | /25 |
| | 73.68%A | 17.63%B | 8.68%C | /99.99 |

I have to admit that this ratio threw me for a loop, and it took a while before I realized that the empirical ratio was out of 84% total. It makes sense that not all F21 nuclides would last long enough to participate. Adjusting the ratio to see if it is in any way comparable to the empirical ratio, we find that it matches:

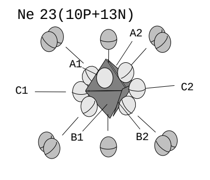
| | | | | |
|---|---|---|---|---|
| Theoretical decay ratio | 61.89%A | 14.81%B | 7.29%C | /84 |
| Empirical decay ratio | 62 | 15 | 7 | /84 |

The idea that only one nuclide configuration is capable of lasting long enough to participate in the formation of unstable F22 is supported by this analysis.

## 7.7 Ne23, B- Decay Analysis:

When the structure of Ne22 was considered, it became immediately apparent that a tetrahedral configuration would leave two neutrons unshielded and subsequently subject to decay. Given that Ne22 exists, in a stable form, the only solution was that Ne 22 must exist in a square biplane configuration. The fact of the matter is that we can only explain the B- decay ratio of Ne 23, if adding another neutron to the square biplane configuration of Ne 22 creates it.

Ne 22, in its square biplane configuration, has 2 uncondensed neutrons situated along the equator of the nucleus, in the C positions, shown below. In theory, a collision with any one of the 8 faces of the 6N core will disrupt the C neutrons, so there should be an equal probability that any one of the three neutrons would decay. This, however, would produce a decay ratio of 66.66:33.33/100, but we find that it is 67:32/99.



| Half Life | Decay Modes | Decay % | Particle Energy | Particle Intensity |
|---|---|---|---|---|
| 3.72 sec | B- | 100% | 3.95MeV<br>4.39MeV | 32%<br>67% |

**Figure 50:** One theoretical structure for the Ne 23 nucleus is shown, with B- decay data.

Consider that 4/8 neutron strikes on unoccupied positions would disrupt the C positions resulting in a straightforward ratio of 1A unpaired to 2C paired neutron decays.

**4/8 33.33%C 16.67%A**

The other 4/8 neutron strikes would strike the shielded bound neutrons, which are stable. While it might appear that there is an equal probability that any one of the three excess neutrons will decay, a cascade takes place because the knocked neutron must resituate. This delay increases the likelihood that one of the two C positions will decay before the knocked neutron. There are 7 positions available to the knocked neutron, 4/7 of these positions would be empty resulting in 4/7B decays, but 3/7 would be occupied, resulting in another cascade 3/7 times. The primary cascade would have a ratio of:

4/8 2C {(4B,3R)/7}

Followed by second, and third cascades for each 'R' occurrence. Under normal circumstances, if the spectrum of events were long enough, a 2:1 ratio would present itself. The problem here is that we are dealing with neutrons that are decaying, which explains the shortened field of 99 versus 100. A decay field of 99% matches the empirical ratio, which suggests that only two cascades are occurring before final decay:

| ***Cascade*** | ***Ratio C:*** | ***Ratio B*** | ***Total Ratio 8/8*** | ***%Decay*** | |
|---|---|---|---|---|---|
| 1 step | 2.0476C | 0.8574B | 67.43%C | 30.96%B | 98.39 |
| ***2 steps*** | ***2.0204C*** | ***0.9391B*** | ***67.00%C*** | ***32.32%B*** | ***99.32*** |
| 3 steps | 2.0087C | 0.9742B | 66.81%C | 32.91%B | 99.72 |
| | Average: | | | | |
| | | | 67.08%C | 32.06%B | 99.14 |
| | ***Empirical Ratio*** | | | | |
| | ***67*** | | ***32*** | | ***99*** |

While the second step matches the empirical value, it is reasonable to assume that a mixture of these ratios would contribute. This still matches the empirical ratio of 67:32.

## 8.0 Concluding Remarks:

For the first time, we can appreciate how electron shells can exist without contradicting the simplest rules of electrodynamics. The important distinction between this model and the electron shell or valence bond theories is that this arrangement allows electrons to be in the same general vicinity while at the same time being insulated somewhat from one another. Electrons are in geometrically localized areas, because they are held in that vicinity by their attraction to and one to one interaction with individual protonic ligands of a structured nucleus.

For the first time, we can comprehend how it is possible for two repulsive electrons to pair together in a specific localized region around the nucleus: The formation of nuclear covalent bonds, between nuclear Hydrogen, creates nuclear $H_2$, which we identify as nonbonding pairs of electrons, or 'lone pairs'. Every nuclear H is a potential covalent bonding site, until it is forced into a nuclear $H_2$ "lone pair" configuration. The lone pair system is covalently inert because, unlike nuclear H, there is basically one electron on the outside of that system at any given time, which prevents the formation of a stable covalent bond, by electron-electron repulsion.

A covalent bond is not the static overlap of two repulsive electron densities; rather, it is the intermittent sharing of a single electron between two protonic ligands. As one electron is pulled into one nucleus, another cycles between the two protonic ligands of the bond, from the other nucleus. This alternating process creates a net attraction, via alternating electron bridges between two protonic ligands of two atoms. The strength of a covalent bond should depend to some degree upon the frequency of the two electron orbits in question, whether they are similar or not, in phase, or shifted. If the orbital speed of the electrons on two nuclei differs significantly, the more interference there is to that bond, and the weaker the bond should be.

The geometrical distribution of nuclear H, and nuclear $H_2$ lone pairs, and therein the localization of electrons around the nucleus, prescribed by this model, superimposes itself over existing electron shell theory with only minor corrections. The difference, which has not been emphasized, is that this model *dictates* where nuclear $H_2$ lone pairs *must* situate within the structure of molecules, without the addition of empirical rules.

The ability of this model to account for bond angles will become more apparent in future papers, when we cover nuclei with more complex protonic shells, and cores. It is the structure of the neutron core, and the ability of valence neutrons to coordinate and bind nuclear Hydrogen within openings in the protonic shell, that determines the bond angles.

The distinction between the electron orbits of molecular H and nuclear H, allows us to appreciate the phenomenon of Hydrogen-bonding in a new way. The rotation of charge around molecular Hydrogen, explains how it is possible for it to bridge between atoms. In this limited brief, the most stable oxidation states are presented. It needs to be appreciated that nuclear $H_2$, like any other covalent bond, can be broken, and that an atom's proton shell structure is capable of being modified, rearranged, and basically forced into other geometries. The number of different oxidation states and molecular shapes possible, however, are restricted by the ability of the neutron core to compliment other arrangements. I was not able to explain, in this brief, the nature of double bonds and triple bonds, and reserve that for a future paper that deals with organic chemistry.

The weight of the fundamental atomic model, even in this limited introduction, is in its ability to explain, if not predict, why one combination of protons and neutrons results in a stable nucleus, while another combination does not. This has never been done before, even qualitatively. Whether a particular nuclide is stable and or found in any abundance is relative to the overall symmetry of the nucleus. Basically, asymmetry equates to a net force, which can destabilize the structure of the nucleus, and or the neutrons of the core.

Abundance is more of an indicator of nuclear stability than experimental determination. Bombarding a nuclei to determine its stability, effectively determines how well it stays together when struck, rather than when formed. Certainly, a nucleus will be more stable if the neutron core and protonic shell are both symmetrical. The problem is that protons repel one another, and during bombardment, it is more likely that a nucleus with more $H_2$ lone pairs will appear more stable. Understand, that the idea that certain 'numbers' of 'nucleons', or that combinations of those numbers are 'magic', is simply a coincidence, numerology at best. The magic nuclei in this model, present naturally as the most symmetrically complete nuclei, they are a corollary, an afterthought. Any attempt to use the magic numbers, to incorporate them into a catalogue that outlines nuclear stability, is nothing short of mysticism. I can assure you that even the 'magic' nuclei, which do not fit into the magic number scheme, also meet the requirements of symmetry, and completeness in this model.

Is it a coincidence that this model explains why certain combination of protons and neutrons cannot result in a stable nuclide, why there is no stable nuclide of mass 5 or 8, for instance? What is not immediately apparent in this sequence of elements is that this model explains why certain neutron cores, such as 19N and 21N, are not found in stable nuclides. Simply, a neutron core must compliment the protonic shell, and it must do so in a manner that allows the core to remain stable. Understand, that there has never before been an accurate explanation of why the number of neutrons increases periodically, in the manner that it does. The answer is, "the nuclei are structured".

In this section of the elements we can see where, when, and why certain elements are allowed to exist in a stable manner, with extra neutrons. In future papers, it will be shown that extra neutrons are intermittently required to fill in various shell positions, shielded positions on complex cores, before a structure is realized, before a neutron reaches a position that is capable of coordinating with an opening of the protonic shell, thereby forming a nucleonic bond. This explains why there are seemingly unpredictable, irregular, jumps in the number of neutrons required to stabilize a nucleus. In this model, the jumps are required, predictable, and nuclides could not find stability otherwise. When a given number of protons and neutrons cannot reach a stable, complimentary state, the element does not exist.

I have not attempted, at this time, to use the equations of electrodynamics to see if composite spinning neutrons, and the mutual repulsion of protons, can support the idea of what is basically an oscillating and yet electrostatic protonic shell. . It needs to be appreciated that it is difficult to formulate a mathematical apparatus, when it has not been conclusively shown that a strong force exists. The distinction between strong and electromagnetic forces is useful, however, because it allows us to distinguish between the two mechanisms of force, which is created as a consequence of the inward flow of space into substance.

In the case of the 'strong force', I am referring to the inward flow of aether into the fundamental components of composite particles, whose mechanism is one of a push inward, which causes all particles to come together in all realms of known force. In the case of the electromagnetic forces the mechanism is one of pressure, and specifically the pressure created by the inward flow, but it is the relative interactions of rotating fields of pressure, surrounding complex particles system that determines whether particles will move together or apart.

While I have included the notion of a 'strong force', the structure, interaction, and internal bonds of the atom are electromagnetic in nature. In order for protons to remain somewhat distant to the neutron core, repulsion must exist within the nucleus, to a greater degree than is currently accepted. The fact that Beryllium 8 undergoes homogeneous fission into two alpha particles is also grounds to question how the nucleus is held together. The Fundamental Theory provides for one cause, one universal force, which exists as an actuality. It is the strong inward flow of aether into the individual fundamentals of composite particles or virtual particles, which brings all substantial bodies together.

The difference between this model, and models that incorporate the concept of particle exchange, is that there is no time delay, no drift contradictions. The forces of this model, at all levels of subatomic structure, including the subatomic, atomic, and macroscopic are all actualized within the fabric of space, rather than as some innate mystical power residing within this particle, or that planet.

The role of a scientist is to accurately measure a phenomenon, gather data, form a mathematical apparatus, including equations, make hypothesis, construct theories, shape models, make predictions, test those predictions, and thereby validate the correctness of their model. While it is true that the fundamental theory is more philosophical in nature, this is predicated by the complete failure of modern science to construct a mechanical model to explain the contradictory nature of the subatomic realm. Out of necessity, I have been forced to identify the inherent flaws and assumptions that have plagued mainstream science, which have limited our ability to accurately model the subatomic realm, in order to provide a picturesque view of the subatomic and atomic realm that is consistent with the ideals of natural philosophy. It is not my intention, however, to overthrow existing theories based entirely upon philosophical preferences, and I recognize that even the model that I have created requires more evidence, or validation, before it could ever become accepted by mainstream science. In keeping with the scientific process, I have made predictions based upon the model, which include the existence of structured nuclei, and I have made use of existing data in order to validate those predictions.

In order to prove that the nuclei are structured, in the manner prescribed by this model, I have used a rudimentary statistical analysis to show a direct correlation between the proposed structure of unstable nuclei, and the empirically determined B-decay ratios of neutrons decaying from within those nuclides. The idea is that, when we take into consideration all possible unstable configurations of an artificially produced unstable nuclide, and if the nuclei are structured as prescribed, that we should be able to reproduce the B- decay ratios. This is found to be the case in all seven cases where complex ratios of B-decay are empirically found in this selection of elements.

If I was successful in reproducing the ratio for one unstable nuclide, it could be dismissed as a mere coincidence. The fact of the matter, however, is that it works for all nuclide decays involving B- decay, including those where it is obvious that only one neutron decay is likely, which corresponds in all cases with only one B- decay energy being observed...

In retrospect, and the irony of it all, is that all previous atomic models were basically true to some degree. For instance, Thomson's plumb pudding model demanded that protons and electrons mix, which is a requirement of electrodynamics. Again, Rutherford's findings proved the existence of a nucleus, without any idea how repulsive protons could pack together. The discovery of the neutron yielded the concept of a nucleonic bond, however misguided they were in defining that bond. The idea that electrons are localized to specific regions around a nucleus is also correct, and is absolutely required by chemistry. The electron shell model is still relevant, if not better understood. How and why quantum theory works at all, however manipulated or contrived it may be, may be due in part to the fact that it only works for Hydrogen, and Hydrogen in this model is a nuclear component. Quantum theory, however, has some explaining to do.

Quantum theory boasts that it has the ability to successfully describe all atomic and molecular phenomenon, and that all of the predictions that it has made, have been verified. I think, and a lot of people will recognize, that there are many ways to interpret both experiments and data. History has repeatedly shown that complex theories, which appear to explain current data, are often replaced by newer theories, once new data is available. The same could be said, and should be said about concepts, models, and theories. The difficulty with quantum theory is that it does not even recognize the contradictions within its own treatment, less alone the inherent flaws that plague mainstream science overall. For some reason modern science acts like it has some kind of diplomatic immunity, which makes it philosophically unaccountable. Is there any other corporation in the world that is allowed to distribute flawed merchandise, without a forced recall?

Quantum theory will have to account for the fact that another model can explain how and why electrons arrange the way that they do, without contradicting classical electrodynamics, without *even considering* the wave nature of the electron! How is quantum theory going to explain structured nuclei? Similarly, the standard model is going to have to explain how nuclei are structured in the manner prescribed in this model, how a model of force, which does not involve particle exchange is able to predict which combinations of protons and neutrons are stable, and which are not, based simply upon electromagnetic principles of symmetry and equilibrium within the nucleus. Eventually, I will have to explain what role unstable subatomic particles play in our structured existence, if at all. Further, I will have to explain how they are structured in a way that is more consistent, more founded, more provable, more qualified, and less arbitrary than the quark model could ever be. Seriously, how did the quark model ever get sold?

Rather than attack quantum theory head on, which would require an enormous amount of time, intellect, and higher order mathematics, I have chosen to reveal and confirm what modern science could not- that the nuclei are structured.