

The Fundament of the Fundamentality of What is Fundamental

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The Definition of the Word Fundamental

Man's language is confounded in many ways. First is the large number of different languages, which make it very difficult for two people to communicate successfully when they both don't understand the same language. The confounding goes much deeper, however. Most words in a language have several meanings, which may be very different from one another. Often the communicator's intended meaning can only be discerned from the context of surrounding words in the communication. Since most of those words can also have many different meanings, this can be very difficult, especially for those who do not know the language well. As an example, if I write: "That man is going to find his soul mate tonight." Am I saying that he will actually find his soul mate during this night or am I saying that tonight he is just going with the purpose or intent to look for and hopefully find his soul mate? In the above example, more context is needed to be sure which meaning is intended by the writer. If after the word, tonight, above, I added "and this prediction will come true" you could understand that I meant the first meaning mentioned above, but if instead after the word, tonight, I added "and I hope he is successful" you would be able to understand that I meant the second meaning. Spoken language can be more difficult to understand than written language because different words can often be pronounced the same. If I said "the book was read yesterday", it would sound the same as if I said "the book was red yesterday". Another problem is that the meanings that are applied to a given word can change over time. Sometimes a completely new meaning will be added while at other times only slight differences or nuances of an existing meaning may occur. Each person may also interpret the same word slightly differently under specific usage patterns. Because of this confounding of the language, when we look for the meaning(s) of the word fundamental that apply to use in the area of science and more particularly to physics and associated areas of study, we must understand that some of the word's meanings will not apply while other new nuances or changes in meanings may continue to occur over time to fit the word into changing concepts.

The word fundamental comes from the word, fundament, which in turn comes from the word fundare, which comes from fundus. To start at the bottom, fundus means: the bottom. This implies the lowest level of a hierarchical structure. Generally, if there is a bottom there must by extension also be a top and possibly also one or more intermediate positions between them. Fundare means: to lay at the bottom, foundation. To lay at the bottom implies the action of placing at the bottom that which belongs there. Foundation and the bottom both imply that we are talking about the lowest level of a structure which also contains one or more levels above it that are built up upon it and are dependent upon it for support or to provide the needed prerequisite structure to allow the next level to be created or at least to be added to the overall structure involved. Fundament means: a basic principle, the buttocks, anus, foundation. Together, a basic principle and foundation imply the most basic principle or the one that all other principles depend on. I will refrain from making anal jokes about buttocks and anus and leave that to others, but it is worth noting that when you are sitting, they are positioned at your bottom and the main part of your body is supported by and positioned upward from them. Fundamental means: (of or forming a foundation or basis; basic; essential), (designating or of a fundamental in physics, such as the fundamental or primary colors, fundamental tissue of plants, fundamental tones that produce harmonics, etc.), (a leading or primary principle, rule, law, or article, which serves as the groundwork or basis; essential part). Of or forming a foundation or basis; basic; essential implies that a basis or

foundation upon which a structure is built may be composed of one or more than one fundamental. The words basis, basic, and essential describe the foundation as the base upon which the whole structure is built and that it is essential to allow the structure to be built. It cannot be built without this foundation. Under, designating or of a fundamental in physics, the examples of primary colors and fundamental tones are examples of foundations that contain more than one fundamental structure within them that work together as a connected nonhierarchical or flat structure, while fundamental of tissue represents a foundation that only contains one fundamental. A fundamental can be a principle, rule, law or, article that is the leading, primary or is the most important essential basis upon which the groundwork of the foundation is built. When we put these concepts together we can say that a fundamental is an/the essential principle, rule, law, or article that forms the groundwork for the foundation, is a part of the foundation, or forms the complete foundation upon which a hierarchical structure is built. Although the structure as a whole is hierarchical in nature and thus built up of layers and any given layer requires the existence and functioning of all lower layers of the structure in order for it to exist or to function properly, the foundation can be composed of fundamentals that are not in hierarchical relationships with each other, but are instead on an equal shared relationship within the foundation as in the three primary colors given in the example above. In order for the foundation to be complete, it must contain all three primary color fundamentals, but each fundamental is of equal importance to the completion and correct functioning of the foundation. One important concept to consider when working on a hierarchical structure is that one hierarchical layer can often be considered the foundation of the next higher layer. Of course, all of these concepts of what is fundamental must be able to be applied to the real world science of physics, etc. for it to be useful. Before looking at how these things apply to the real world, it should be mentioned that in the same way that a building can be built up from the foundation with each floor on top of and supported by the floor below it and at the same time it can have an open area that goes from the bottom to the top of the building which does not get support from the intermediate floors, but just from the top, bottom, and outside wall structure, it is also possible to have a hierarchically built structure that connects with other structures that remain the same and are unmodified in their structure in their use and function at all levels of the hierarchy.

What is Fundamental in Man's Current Understanding of the Real World?

The real world is a hierarchical structure of several levels. When analyzing such a structure you can either, start at the top level and work down or you can start at the lowest level and work up the hierarchical chain. Since man lives mostly in the top structural levels and does not yet completely understand the lowest levels, most tend to start at the top and work down. When you understand the lowest levels adequately, it is almost always easier to start at the bottom level and work up because the levels tend to expand in structure as you go up the structural chain, which tends to make it more difficult to understand a level fully. I will, therefore, attempt to start at the lowest level and work up to the highest level.

The First Structural Level

I will start at the foundation of the world that man can presently understand to exist and will not go far into what generates it. That foundation consists of two fundamentals. The first is the spatial structure and the other is motion. Man is familiar with a bidirectional dimension, three dimensional structure in which each point in any one dimension is connected to every point in the other two dimensions to produce a three dimensional matrix output with each dimension joined at ninety degrees to the other two dimensions. Each position in this matrix contains a position information component for each of the three dimensions. (There are other ways to represent this structure, but this is currently the easiest way for man to work with.) The spatial system also contains a fourth dimension that is very small in length

and only the center third of it is connected to the other three dimensions at ninety degrees. It also contains a fifth dimension that is connected to the fourth dimension and also has connections to the other three dimensions. The purpose of the spatial structure is to provide positions for motions to exist in and move between. A motion is a simple structure that contains only three information structures. First is the motion's current position in the spatial system with components for position in each of the first three spatial dimensions. The next is its direction of travel in each of these spatial dimensions. The final information structure is the motion's current motion amplitude (speed) with components in each of these spatial dimensions. All such motions that travel with a three dimensional composite speed that is equal to or less than the speed of light only travel in the lower three dimensions and are called sub-energy particles. These particles are used to bind matter structures together at all levels of the structure of the world. They generally only interact with each other or other types of particles under certain specific conditions. We live in a sea of these particles and except in certain situations we can't discern their existence. At this point we can see that the foundation of the first hierarchical level contains the fundamentals of a three dimensional spatial system and motion particles that contain motion in at least one of those dimensions and any one, such particle's total composite motion level in all three dimensions is less than or equal to the speed of light. This is the sub-energy field particle structural level.

The Second Structural Level

If a sub-energy particle's composite three dimensional motion amplitude exceeds the speed of light, it exceeds the barrier that normally prevents motion transfer from the lower three dimensions into the fourth dimension. Then all of the motion that exceeds the speed of light can be transferred into the fourth dimensional component of the particle. The fourth dimensional motion travels to one end of the fourth dimension and interacts with the dimension's end barrier. The barrier cannot receive the motion, so it is returned to the particle, which causes an opposite directional change in the particle's motion. The motion then travels to the other end of the dimension and the same thing happens there. This back and forth flow of motion continues as long as the motion exists in the fourth dimension. When the motion is at the end of the dimension it is just outside of our three dimensional structure, so that it can't contribute any of its motion to an interaction between that particle and another particle. As it begins to travel away from the end of the dimension, it begins to enter our three dimensional structure, so that it can begin to transfer some of its motion to another particle during an interaction. When it is located at the center position between the two ends of the fourth dimension it is completely located within our three dimensional structure and can transfer all of its motion to another particle during an interaction. It is this cyclical increase in motion transfer capability or increase in mass effect from zero to some maximum level and then a decrease back to zero followed by an increase again in the opposite direction and then a decrease again to zero that is called the particle's frequency. The greater the fourth dimensional motion's motion amplitude is, the higher the frequency is because it can complete a back and forth motion flow cycle more quickly. Since it is still traveling at the speed of light in its linear motion, it will travel a smaller distance during one cycle, which results in a shorter wave length. The greater the fourth dimensional motion is, the greater is the amount of motion that can be transferred to another particle during an interaction, which results in an increase in its dynamic mass effect. When a sub-energy particle contains enough motion and transfers it to its fourth dimensional component it is thereby converted into the next higher hierarchical structural level and becomes an energy photon. The foundation of the second structural level contains the fundamentals of the fourth spatial dimension and the addition of enough additional motion amplitude to a sub-energy particle to bring its linear motion level up to the speed of light if it is not already there and the transfer of some additional motion into its fourth dimensional motion component. This is the energy photon hierarchical structural level.

The Third Structural Level

The connection structure between the fifth dimension and the fourth dimension allows motion to transfer from the fourth dimension to the fifth dimension once the fourth dimensional motion amplitude exceeds a specific threshold level and the photon comes into adequate proximity to a strong enough angular motion such as the sub-energy spheres of a matter particle, etc. The connection structure between the fifth dimension and the lower three dimensions is such that fifth dimensional motion transfers back down into the lower three dimensions in a specific sequential pattern. It starts at a zero level in dimension one and increases linearly to a maximum level and then decreases linearly back to zero. When the motion transfer level to dimension one is at its maximum, motion transfer starts into dimension two and reaches a maximum level there when the transfer to dimension one reaches the zero level. At the same time motion transfer to dimension three begins. Motion transfer into dimension three reaches its maximum level when transfer into dimension two reaches the zero level and motion transfer into dimension one also begins again at that time. (This is only a simplified example of the motion flow that is given for demonstration of the concepts. The actual detailed flow structure is currently not for release to man here.) The introduction of this motion amplitude into the lower three dimensions causes the energy photon to travel in a three dimensional curved path that encloses upon itself to form a three dimensional enclosed cyclically repetitive path. It would also cause the photon to travel in that path with a motion amplitude that would be greater than the speed of light, except that the excess motion over the speed of light is transferred into the fourth dimension. This leaves only the angular motion changes that generate the curved enclosed path in the lower three dimensions. Once the motion is transferred back into the fourth dimension, it will be transferred back into the fifth dimension as long as the fourth dimensional wavelength fits properly into the particle's enclosed path, such that the proper angular component exists to allow the transfer. If it is transferred into the fifth dimension the inter-dimensional motion transfer cycle is complete and the new matter particle is stable. If the proper angular motion component is not present the motion remains in the fourth dimension and as soon as the fifth dimensional motion is completely drained into the lower three dimensions the curved path ends and the particle travels off in some direction as an energy photon (the matter particle was unstable). Most matter particles are unstable. When the fifth dimensional motion amplitude is very high and also unstable, it is possible for it to take long enough for it to drain completely into the lower three dimensions to allow the fourth dimensional wave condition to align long enough to allow some motion to travel back into the fifth dimension. This allows the matter particle to exist at this lower motion level as a different matter particle for some time, but if that particle is also unstable the angular motion will once again disappear and the fifth dimensional motion will continue to drain further. As it drains, the particle's enclosed path size increases and the extra motion that is received by the fourth dimension decreases its wavelength, so it could reach a size in which the fourth dimensional wavelength will fit properly to generate the needed angular motion. In that case the particle could end up as a stable particle. This is only a subset of all possible results, but it gives the general idea in adequate detail to allow others to fill in the blanks. The continuous flow of the energy photon around its enclosed path entrains sub-energy particles to flow through the matter particle from an input on one side of the particle to an output on the other side of the particle. This is the matter particle's internal sub-energy field structure. As the energy photon travels around its three dimensional path, the sub-energy output and input travel around with it on the surface of the path. The sub-energy flow is modulated linearly from a zero level to a maximum level and then back to a zero level by the fourth dimensional motion of the photon. This causes the production of concentric sub-energy spheres around the matter particle that vary in density from zero to a maximum and then back to zero in a linear pattern. This is the matter particle's external sub-energy field. This is the basic matter particle hierarchical level of particles such as

the electron. Its foundation is composed of the fundamentals of the fifth dimension and the motion in that dimension and the creation and binding of the internal and external sub-energy fields to the particle. Antimatter particles are just matter particles in which the fifth dimensional motion is traveling in the opposite direction from that of normal matter particles. If they interact, their angular components generally cancel out and they revert to energy photon(s).

The Fourth Structural Level

It is possible for two or three basic matter/antimatter particles that might not be stable by themselves to join together to form a larger composite particle by the proper joining of their internal sub-energy fields. Those that contain two sub-particles are generally not stable; some of those that contain three sub-particles, such as the proton and neutron are more stable. These composite matter particles could be considered the fourth hierarchical level. The foundation of this level would contain the fundamentals of basic matter particles and the structure and orientation, etc. of their sub-energy fields that bind them together into a single composite matter particle.

The Fifth Structural Level

When an electron approaches a proton, it is attracted to it. If their relative motion is not too great, the electron will pass through the proton's high density sub-energy spheres until the attraction of the proton's outer sub-energy spheres that it has already passed through is equal to the attraction of the sub-energy spheres that remain in front of it. Then it comes to rest in the low density area between two high density spheres. Since the sub-energy flow within a given high density sphere is from the particle's sub-energy output intersection with that sphere to its input intersection with it, this creates a flow that is generally perpendicular to a line that is heading directly toward the center of the particle. This flow controls the electron's motion amplitude and the direction of its travel, since it rides what is essentially a three dimensional groove centered on the null area between two high density spheres and comes in contact with them. Since the particle's sub-energy input and output are continually changing their positions on the surface of the spheres because they are following the motion pattern of the photon that is contained within the matter particle's cyclical three dimensional enclosed path, the direction of travel of the electron also changes along with that sub-energy flow. If the electron contains extra kinetic motion when it is captured or if a captured electron receives extra motion from some outside source, it can flow in a higher sub-energy groove than it normally would, but in that groove it will travel faster than the sub-energy flow, which causes it to apply pressure on the sub-energy field. This increases the probability of an interaction between the electron and a sub-energy particle. When such an interaction occurs the extra motion is transferred to the sub-energy particle which then receives enough motion to bring its linear motion up to the speed of light if it is not already there and also additional motion that is transferred to the sub-energy particle's fourth dimensional motion, which changes it into an energy photon, which then carries that extra motion off into space away from the atom. The electron then ends up in the position that is the balance point for it in the sub-energy field due to its mass. The foundation of this first atomic hierarchical level of structure contains the fundamentals of interactions of the sub-energy field of a compound particle (the proton) with a basic particle (the electron) that results in the binding together of the two particles into a hydrogen atom.

The Sixth Structural Level

Most of the interactions between matter particles that occur naturally near us on this planet are relatively low energy interactions that only involve the matter particle's external sub-energy fields. These are usually termed as elastic interactions because the particles appear to more or less bounce off of each other. If the relative motion amplitude of two particles (protons) is great enough, however, the

particles can pass through each other's external sub-energy fields. If their relative kinetic motion is not too great, their external sub-energy fields will combine into a single field and it will contain the two protons within the inner most dense high energy sub-energy sphere of that field. In this way all of the other atoms of higher mass are constructed. An additional structural element of this level is that protons can receive additional motion to change them into neutrons, which also can be added to atoms to increase their overall mass. There are over ninety atoms with different numbers of protons that are naturally at least relatively stable and although others can be made to be stable using structured fields, etc. there is a relatively small limit on the number of different atoms because as the number of particles contained in an atom increases, the surface area of the inner sub-energy high density sphere increases to the point that it can no longer adequately contain the particles within it and particles within the atom can also combine their motions together to penetrate the sphere, etc. The foundation of this second atomic structural level contains the fundamentals of the joining of sub-energy fields of matter particles into a single field to contain all of the particles within its inner high density sub-energy sphere and the ability of the particles' internal sub-energy fields to keep the internal structural motions of the particles' within that sphere from interacting with each other so that the integrity of each of the particles is maintained.

The Seventh Structural Level

Because of the ways that electrons can be structured within atoms' sub-energy fields as the size of the atoms increases, (which I will not go into detail about in this paper due to space limitations) the outer level of electrons will not be filled up in many atom sizes. When two atoms with incomplete outer electron levels come together it is possible for their outer sub-energy spheres down to and including the outer sphere that contains electrons to merge into a single field of spheres encompassing both atoms. This allows the electrons that were in the outer spheres of each atom to travel the new sub-energy sphere flow that now flows around both atoms. This shared sub-energy field structure and the more balanced electron positioning structure that results, binds the two atoms together into a molecule. Such a shared field structure can, of course, contain more than two atoms as needed to completely fill and stabilize the outer electron level of the total molecule structure. Since all of the different atoms that do not have completely filled outer levels can be combined in many ways to produce molecules of all sizes from two atoms to the extremely large numbers of very large molecules such as DNA molecules, it would not be possible to have one of each different molecule that could be made in existence all at the same time because there would not be enough matter particles in the universe to make them all. The foundation of the molecular structural level contains the fundamentals of the number of unfilled positions in the outer level of electrons in each type of atom, the ability of the outer sub-energy levels of atoms to be joined together to allow the filling of the effective outer molecular level, and the binding effect of this joining of atoms into molecules.

The Eighth Structural Level

The molecules can be joined together in many ways to produce the large scale objects that we regularly experience in the world around us. This last level of the hierarchical structure of the universe involves almost limitless structuring methods to make things of all complexity levels from the water that we drink to the living creatures that drink that water and are largely composed of it. Its foundation is primarily based on the fundamental of the molecules upon which it is based.

Extrapolations

When we analyze the total hierarchical structure, some interesting concepts result. The first level only produces one structural entity, which is the sub-energy particle. The second level only produces the

energy photon, which contains a first level sub-energy particle within it. Likewise, the third level produces only the basic matter particle, which contains a second level energy photon particle within it, which in turn contains a first level sub-energy particle within it. The fourth level is actually not the production of a completely new structure, but is an assembling of multiple basic matter particles by their sub-energy fields into a compound particle structure, such as the proton. The fifth and sixth levels also join together existing basic and/or compound matter particles together by their sub-energy fields into atoms. The seventh level only combines atoms together to form molecules and the eighth level uses those molecules to make the large scale world that we live in. From this it is clear that the lower three levels produce the most basic structures from which all other structures are constructed. The other levels generally take the output structures created in the previous level and join them together into more complex hierarchical structures. The sub-energy particles of the first level can be seen in use at all of the other levels as the input basis upon which the energy photon and also the matter particle are built. It is also used at all of the higher levels to bind together the more and more complex hierarchical levels of matter particle combinatorial structure. On the other hand the energy photons are generally not so much used in the construction of the hierarchical structure, but instead it is used to transfer motion and information between such structures at all levels. The matter particles are, of course, the building blocks from which all the higher hierarchical structures are built. The total structure looks something like a tree with a trunk composed of the first three levels and the next levels in order building out the smaller and smaller branches with the leaves, flowers, and fruit, as the large scale world. A tree, of course, also has hidden roots that supply and support the above ground parts of the tree. From this it is useful to consider whether there is a behind the scenes structure that produces the motions from which all things in this world are composed. Our world could just be the output of a very complex machine something like a television that produces not only light output, but also produces matter outputs. We could be the artificial intelligences in a very complex video game. Of course, the characters that are played by the maker of the game would have all of the advantages of being led to make all the right moves. If the maker likes that character enough he might even save him to use in his next bigger and better game. It is interesting how man's creations such as video games could come from a built in desire or imperative placed in us by our creator to show that we are actually made in his image with a desire to create a world in which we work through the body of one or more members of that created world to accomplish our desires. That insight into why the true creator might want to use this world to produce a body that is composed of beings from this world creation that he has chosen to take into the new world as parts of his body joined into him, much as our bodies are joined into us, in which he can live in a new better creation than this one, could be the difference between just being a short lived artificial intelligence in this world or being joined into an endless life as part of the creator, that is composed of beings from this world creation that he has chosen to take into the new world as parts of his body, both in this world and also in a new endless world to come after this one is ended.