HOMOGENEITY AND ANISOTROPY OF UNIVERSAL MEDIUM

(According to "*Hypothesis on* MATTER")

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Abstract: A real universal medium should be made up of matter - the only substance that can provide objective reality and positive existence in space. An ideal universal medium should be of homogeneous consistency and it should fill entire space, outside 3D matter bodies, without voids (empty space). At the same time, the universal medium should be flexible enough to have properties of a perfect fluid. Anisotropic nature, which allows relative motions within universal medium, requires that the universal medium should be structured by sub-particles and each of its component matter particles has lot of (apparently) vacant space around it, to allow relative motions. This article attempts to describe, how these contradicting properties are simultaneously achieved in the universal medium, proposed in 'Hypothesis on MATTER".

Keywords: Universal medium, quantum of matter, 2D energy fields, Hypothesis on MATTER.

Introduction:

This is purely a theoretical exercise based on an alternative concept, put forward in '*Hypothesis on* MATTER', which is based on only one type of postulated matter particle. This concept is able to provide logical explanations to all physical phenomena in nature, without help from imaginary particles or irrational assumptions. All conclusions expressed in this article are taken from the "*Hypothesis on* MATTER" [1]. For details, kindly refer to the same.

Matter and universal medium:

Matter is the only substance in nature. It provides all real entities with objective reality and positive existence in space. Matter in universe exists in the form of tiny particles – quanta of matter. Quanta of matter, in various combinations, form all other real entities in nature, including all-encompassing universal medium. Existence of universal medium does away with the illogical assumption of 'actions at a distance

through empty space'. To act and to be acted upon, the universal medium has to be a real entity and all real entities are made of matter. It also has to fill the entire space and encompass all 3D matter bodies in nature. Therefore, this concept envisages a universal medium, formed by quanta of matter, which fills entire space outside three-dimensional matter particles.

Constituents, development, structure, properties and actions of universal medium are briefly explained in article [3], 'Universal medium', available at http://vixra.org/abs/1007.0042. In this concept, the universal medium is called '2D energy fields'. Each plane in space has one 2D energy field each, extending in all directions, in its plane, to infinity. 2D energy fields in all possible planes in space, together, form the real universal medium. Nature of universal medium and its suitability for actions in 3D world, in terms of point of view of three-dimensional rational beings, are briefly discussed in this article.

No 2D energy fields are ever destroyed or no new 2D energy fields are ever developed. They are perpetual and sustain an eternal universe. However, local breakdowns and re-constructions in their structures are very common due to various reasons. 2D energy fields create, sustain and destroy 3D world in a cyclic manner.

Spatial dimension:

Space is an imaginary entity, presupposed by rational beings, whenever they envisage matter-bodies. In this concept, the universal medium and 3D matter bodies, together, fill the entire space. Hence, the real universal medium can substitute for imaginary space. Universal medium acts as a real container of all 3D matter bodies. Real universal medium substitutes the imaginary space. Space and universal medium become synonymous.

Two separate 3D matter bodies cannot simultaneously exist in same location in space. Space, being the container of all three-dimensional bodies, 3D matter bodies in space (in nature) are situated at different locations. For convenience of rational beings (us) to locate different 3D matter bodies in space, certain reference is needed. In order to create reference systems, space can be partitioned in various ways. In a convenient and widely used method, space is divided into eight parts by three mutually perpendicular planes. This method gives us three-dimensional spatial system. In this system, we measure distances in different co-ordinate planes (passing through a reference point in space), to give us length, breadth and depth (thickness).

Every real object has positive existence in space. Hence, it is imperative that it should exist in all three spatial dimensions. Matter particles, being real objects, exist in all three spatial dimensions. In nature, there can be enormous differences in sizes between different matter bodies. Some are extremely large and some are extremely small (beyond our comprehension). We, the rational beings, are three-dimensional macro bodies. We are made of numerous 3D matter particles. Usually, we deal with 3D matter bodies, whose sizes (though vary widely), are within our understanding. Various instruments do expand our intellectual capacity to comprehend wider differences in 3D matter bodies' sizes.

However, there is a limit (which is constantly being increased by newer instruments) to measure distances in any spatial dimension. A distance that is absolutely intangible by our 3D standards could be counted only as negligible or functional, without real meaning in the sense of measurement of distance. Although it is not correct by absolute standards, we are bound to ignore such measurements or consider them to be non-existent. If one spatial measurement of a matter body falls in this category, we are bound to consider that body, as a two-dimensional matter body that has its tangible body-dimensions only in 2D spatial system. This matter body, for all practical purposes will be treated as a 2D matter body. If two spatial measurements of a matter body fall in this category, we are bound to consider that body, as a single-dimensional matter body that has its tangible body-dimensions only in 1D spatial system. The matter body, for all practical purposes will be treated as a 1D matter body. However, it should be very clear that both, 1D and 2D matter bodies have their existence in all three spatial dimensions like any other 3D matter body.

Homogeneity of universal medium:

Universal medium, in this concept, is envisaged as structured by quanta of matter. In 3D world view, no two independent 3D matter bodies can simultaneously occupy the same location in space. Therefore, however close constituent quanta of matter of universal medium are packed, there are bound to be gaps in universal medium. This cannot be tolerated in a homogeneous universal medium. Matter-density of universal medium should be identical everywhere in space, a requirement that precludes gaps. This

conundrum is overcome by universal medium's structure by quanta of matter in their lower spatial dimensional states. In these states two quanta of matter are able to coexist, simultaneously, in same location in space without interfering with each other. This phenomenon prevents existence of gap between quanta of matter, forming universal medium.

Being capable to coexist, quanta of matter in different directions are able to fill the entire space (outside 3D matter-particles) to form a homogeneous universal medium. 3D matter-particles are formed by quanta of matter, in their 3D states. Matter-densities of quanta of matter are same, irrespective of their spatial states. Therefore, matter-density of 3D matter-particles and universal medium will be same. Universal medium exists outside 3D matter particles. Matter-density will be equal everywhere in space (in 3D matter particles as well as in universal medium). As far as matter-density is concerned, whole matter in universe in different spatial dimensions, exists as a single block of matter of uniform consistency.

Quantum of matter:

Quantum of matter is the only postulated entity in this concept. Diverse matter bodies, different properties and all other physical phenomena develop from quanta of matter, which fill entire universe. A quantum of matter has certain matter content. Matter content of a quantum of matter is continuous and incompressible. [This is only a general statement. Minute relative motions, transmissions of effort or deformations within its spatial dimensions, which can be neglected for practical purposes, may be tolerated within a quantum of matter's matter content]. Matter content has a property of self-adhesion, within a quantum of matter and between quanta of matter, which are in direct physical contact. Since matter is its substance, irrespective of its negligible body-measurement(s) in any spatial dimension(s), a quantum of matter has objective (real) existence in 3D space.

A quantum of matter can express its individuality only in spatial dimension(s) of its existence. No two real entities can simultaneously exist in the same volumetric space. Therefore, no two quanta of matter can exist in the same space in the same spatial dimension(s). However, quanta of matter in different spatial dimensions but passing through the same point, in space, are able to coexist at the point.

Practically, a quantum of matter (in any spatial dimensional status), exists in all three spatial dimensions. When its body-measurement in any one spatial dimension is too small to be intelligibly measured by 3D beings, we must say that the quantum of matter exists only in two spatial dimensions. The quantum of matter may be qualified as a two-dimensional object. Similarly, when its body-measurements in any two spatial dimensions are too small to be intelligibly measured by 3D beings, we must say that the quantum of matter exists only in one spatial dimension. The quantum of matter may be qualified as a single-dimensional object. General actions on or by quanta of matter are limited to spatial dimensions of their existence. However, very minute and intangible actions, limited to their (apparently) non-existent spatial dimensions, are also logically possible.

Due to self-adhesion of its matter content, it is an inherent nature of a free quantum of matter to grow and exist only in one spatial dimension [1]. External pressure from ends of a 1D quantum of matter can reduce its body-measurement in first-spatial-dimension and make its matter-body grow into second-spatial-dimension (in width), until its body-shape becomes a perfect circle in a plane, to make it a 2D quantum of matter. Further, if identical external pressure is applied all around periphery of a 2D quantum of matter (in its second-spatial-dimensional state), its matter-body is compelled to grow into third-spatial-dimension, while reducing measurements in other two spatial dimensions. Growth into third-spatial-dimension (in thickness) will continue until body-shape of quantum of matter becomes a perfect sphere. As soon as a quantum of matter grows in to its third-spatial-dimension, it becomes a 3D matter body. This is the stage of creation of 3D matter, in nature. We, as 3D beings, can associate only with 3D matter. Additional pressure applied all around volumetric periphery of a 3D quantum of matter may reduce its volume and compel it to grow into a fourth-spatial-dimension, if any, about which we know nothing.

Since, a quantum of matter has objective existence in its spatial dimension; no other quantum of matter can occupy its space, whichever spatial-dimensional status it may be. However, two quanta of matter in different spatial dimensions have objective reality in different spatial-dimensions. Hence, each of them should be able to have objective reality at the point occupied by both of them, simultaneously. That is, quanta of matter, in different spatial dimensions should be able to co-exist at the point occupied by both of them. As long as its own dimensional space is not occupied, a quantum of matter is able to co-exist with other quanta of matter at a point in space.

Matter contents of quanta of matter have no substructures. They are homogeneous and isotropic. Two 1D quanta of matter occupying same point in space, essentially, have to be at an angle to each other. Their negligible widths (as and when they are developed) have to be in different planes. Since they are 1D objects, they cannot extend into each other's spatial-dimension so as to create discontinuity for other's existence. Since two quanta of matter are in different planes and crossing each other at a point in space (they are in different spatial dimensions), they do not intrude into each other's spatial-dimensions. Due to lack of substructures, matter content at the point of their crossing is able to be part of both quanta of matter, simultaneously. Similarly, a quantum of matter can also co-exist with a 2D matter body (its thickness is zero) in different planes. However, as all spatial-dimensions are occupied by a 3D matter body, a quantum of matter will be unable to coexist with a 3D quantum of matter in space. It will have to remain outside 3D matter body.

A 1D quantum of matter exists only in its own one spatial dimension. Hence, a 1D quantum of matter is able to coexist with another 1D quantum of matter in all spatial dimensions other than its own. A 2D quantum of matter exists in a plane. Another 1D or 2D quantum of matter is able to coexist with it, in all spatial planes other than the plane of the 2D quantum of matter. If located in the plane of 2D quantum of matter, 1D quantum of matter will maintain its individuality and independence as a separate entity, even if it is a component of a 2D matter body, constituted by one or more 2D quanta of matter. A 3D matter body exists in all spatial planes passing through the body. A 1D quantum of matter is unable to coexist with the 3D matter body or any of its constituent quanta of matter, in any of these planes. Even if the 1D quantum of matter is a constituent part of a 3D matter body, it will keep its independence and integrity as a separate entity, within the 3D matter body.

Interactions are possible only between quanta of matter, existing in same spatial dimension(s) and in direct contact with each other. Property of self-adhesion in matter contents, across point of contact between two quanta of matter, encourages matter contents of quanta of matter to merge and form a single quantum of matter, with greater matter content. The concept in 'Hypothesis on MATTER' envisages that due to various reasons, points of contact between two quanta of matter are never steady. Therefore, magnitude of adhesive effort between matter contents of two separate quanta of matter (which are in direct physical contact) through the point of contact is less than magnitude of adhesive effort between nearest points within matter content of individual quantum of matter. This difference in magnitudes of adhesive effort prevents merger of matter contents of different quanta of matter, while preserving integrity of matter content of individual quantum of matter. As there are no free-existing quanta of matter, even when two quanta of matter in different spatial dimensions co-exist at a point in space, their point of contact continuously change. Incessant changes in point of contact reduces magnitude of (average) adhesive effort between matter contents of the quanta of matter in contact to less than adhesive effort within matter contents of individual quantum of matter and thus prevent merger of matter contents of these quanta of matter. Same phenomenon prevents matter contents of intersecting quanta of matter (in different spatial dimensions) from merging their matter contents.

Quanta of matter preserve their individuality under all circumstances. However, in exceptional circumstances of accidents, nothing prevents a quantum of matter from parting into two separate entities. If the attempt, to part a quantum of matter into two, may develop and persist for longer time, the quantum of matter may part into two individual quanta of matter. Another possibility is that of a quantum of matter with exceptionally large matter content. Time required for an exceptionally large quantum of matter to move its whole matter content to one side of a parting intrusion is too long to prevent its matter-body from splitting into two separate quanta of matter.

Coexisting matter particles:

Consider water contained in a vessel, whose horizontal cross section is shaped as a cross. Water body, contained in the vessel may be regarded in five separate parts, one part each in the arms and another part at the center of the vessel. Let the water body contained in each set of arms, in straight line, as separate 3D matter bodies. Part of water, at the center of vessel, belongs to 3D matter bodies in both sets of arms. In terms of macro bodies, we may consider 3D matter bodies (in straight arms) co-exist at the centre of the vessel. This is because; water at the center part of vessel can act as parts of both 3D matter bodies. Even if water in the vessel is frozen, case will be same.

Now, let us reduce widths of vessel's arms. Water in the central part of the vessel will continue to be

parts of 3D matter bodies in both sets of arms, until width of one or both sets of arms are reduced to the size of a water molecule. If width of one or both sets of arms is reduced further, water molecule at the center of the vessel will no more be able simultaneously to be parts of both 3D matter bodies, contained in straight-line sets of arms of vessel. It will be part of either of the 3D matter bodies. At this stage, 3D matter bodies in both sets of arms will no more be able to co-exist. Inability of these 3D matter bodies to co-exist is due to sub-structure of water molecules. Sub-structures of molecules or atoms demand that each molecule/atom can have only particular formations with their neighbours. If this particular type of formations can be preserved by molecule/atom at an intersection, any number of 3D matter bodies can co-exist in space. However, as each type of atom/molecule is unique, this is not practical in cases, where thickness of 3D matter bodies approach very small values. Hence, it is impossible for two 3D matter bodies to co-exist at a point in space.

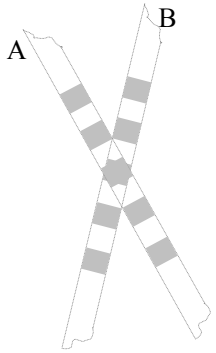

Figure 1

Let us consider two (hypothetical) free 1D quanta of matter, in different spatial dimensions and whose matter bodies pass through a point in space, as shown in figure 1. Spatial dimensions of quanta of matter in its width and thickness are at their minimum possible values. Self-constriction due to self-adhesion of matter content in both spatial dimensions of its negligible existence has reduced to zero value (by 3D status). Therefore, these quanta of matter have no effective borders (perimeters shown in dotted lines) in these spatial dimensions. In figure 1, sizes of quanta of matter are highly exaggerated and only small parts of quanta of matter at their point of intersection are represented. Alternate points in their matter contents are coloured. Each quantum of matter exists in its own spatial dimension. Since, matter content, within a quantum of matter has no substructure; matter content at the point of intersection is able to act as parts of both quanta of matter. Quanta of matter are not overlapping but they co-exist at the point of intersection. Matter content in one quantum of matter is not superimposed on other. Consistency of matter content (and matter-density) at the intersection will be same as it is for rest of the quanta of matter.

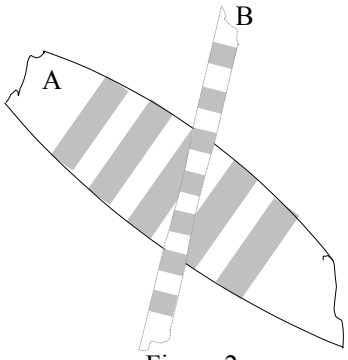

Figure 2

1D quanta of matter, shown in figure 1, together define a plane. If one of the quanta of matter, due to external effort applied inwards at its ends, grows in this plane into its second spatial dimension, both quanta of matter would be occupying same spatial dimensions. They cannot continue to coexist at their point of intersection. As soon as one of the quanta of matter, A, grows into its second spatial dimension, self-constriction in its matter content develops against external pressure at its ends. These inward efforts (towards major axis of the matter content) gives the quantum of matter, A, a definite border (as shown in figure 2 by bold curved lines), to become a 2D quantum of matter. As both quanta of matter occupy same spatial dimension, during its development into 2D quantum of matter, quantum of matter, A, tends to partition 1D quantum of matter, B, into two. But borders of 2D quantum of matter, A, will now provide anchoring points for self-adhesion of other quantum of matter to withdraw all its matter content to one side (as given in paragraph 2.3.4) and exit from the space occupied by quantum of matter, A, which has developed into its second spatial dimension. Similar action takes place during changes of a 2D quantum of matter into a three-dimensional entity.

Figure 3 shows representation of two intersecting quanta of matter. Quantum of matter, B, is in its 1D spatial status. Its matter content cannot be compressed any more in width and thickness. Its upper end (as shown in figure beyond quantum of matter, A) is much longer than lower end. Quantum of matter, A, is at the instant of conversion of its spatial status from 1D to 2D in the plane of paper. As external pressure at quantum of matter, A, overcome its self-elongation, it increases its width. Increasing self-constriction of its matter content forms definite border around quantum of matter, A, except where quantum of matter, B, exists. As quantum of matter, B, is already in its 1D status, its size in the plane of quantum of matter, A, cannot be reduced any further. Reduction of width, shown in the figure, is symbolic and highly exaggerated. It, more or less, indicates directions of effort transmitted to quantum of matter, B, (shown by thin arrows) through quantum of matter, A, from external pressure at ends of quantum of matter, A.

External effort, transmitted through quantum of matter, A, to quantum of matter, B, creates internal pressure within matter content of quantum, B. Since matter content of quantum of matter, B, cannot be compressed any further in this spatial dimension, effort generated will be used to produce translational motion of quantum of matter, B. [Like a slippery incompressible body pressed between two bodies is jettisoned away from compressing bodies]. Minute curvatures, produced at the site of compression help to convert compression into translational motion. Resultant of translational efforts on upper and lower parts of quantum of matter, B, will push out its matter content from quantum of matter, A. Due to self-adhesion of matter content, continuity of matter content in the spatial dimension of quantum of matter, B, cannot be broken. Since matter content of quantum of matter, B, is continuous in its dimensional space, whole matter content of quantum of matter, B, will move in resultant direction of translational efforts on it, shown by thick arrow. Action will continue until any one end of quantum of matter, B, disappear into matter content of quantum of matter, A. Matter content, outside quantum of matter, A, in 1D spatial dimension will now form independent quantum of matter, B.

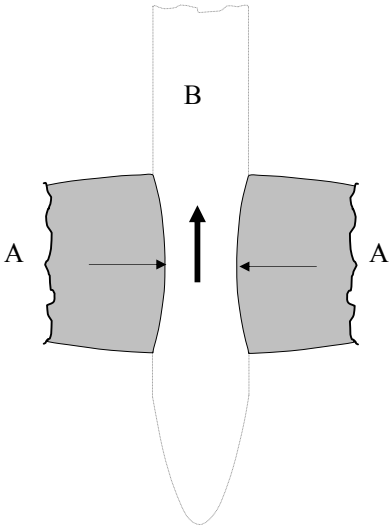

Figure 3

Direction of resultant translational effort on quantum of matter, B, depends on curvatures formed by matter content of quantum of matter, A, about matter content of quantum of matter, B, and internal pressure formed in matter content of quantum of matter, B. For same effort, development of internal pressure in a larger volumetric space will be slower than in a smaller volumetric space. Hence, usually, matter content in larger end of quantum of matter, B, will have lower internal pressure during its development. This will encourage matter content of quantum of matter, B, to move towards longer end.

Formation of partition, slightly away from center point of quantum of matter, B, with uneven curvature, produces an imbalance in self-constriction and self-elongating efforts within the 1D quantum of matter, B. Longer part may have higher self-elongating effort with lower self-constriction and shorter part may have lower self-elongating effort with higher self-constriction. The partition, at the instant of its formation, provides an anchoring point for these efforts. As a result, 1D quantum of matter, B, as a whole, will experience a resultant effort to move its matter content towards its part with higher resultant effort. Thus, 1D quantum of matter, B, will withdraw itself (whole of its matter content) towards the side with higher effort before partition can be completed by the formation of 3D body within its spatial dimension.

External pressure, at the ends of quantum of matter, A, affects its matter content at every point and induce them to expand in their second spatial dimension and shrink in their first spatial dimension. Points in matter contents, which are common to both quanta of matter and existing at their intersection, are also affected similarly. Certain part of their expansion in second spatial dimension of quantum, A, may coincide with translational motion of matter content in quantum of matter, B. Matter contents of both quanta of matter, A and B, coexisted at their intersection, when they were in different spatial dimensions. As soon as they tend to occupy same spatial dimension(s), their matter contents separate into independent status to form quanta of matter in their respective spatial dimensions and outside each other's body.

Let an external pressure act all around the perimeter of the 2D quantum of matter, A, such as to convert it into a 3D matter body. Existence of a 3D matter body at the point of intersection of 1D quantum of matter tends to part 1D quantum of matter into two parts. However, by quantum of matter's inherent nature, it is unusual for matter content of a quantum of matter to be cut into two or made smaller by reducing its matter content. At the instant of conversion of the 2D quantum of matter, A, into a 3D object, a partition tends to develop at the point of intersection of the 1D quantum of matter and the 3D object. Self-elongating efforts, within the 1D quantum of matter, B, on either side of this partition is proportional to curvature and length of parts forming, as explained above with respect to figure 4. [If the 1D quantum of matter is already a part of a quanta-chain, attraction to its neighbors also will be proportional to the length of the parts of 1D quantum of matter, B, being formed.] Thickness of 2D quantum of matter, A, at the instant of its conversion to 3D body corresponds to the thickness of a plane, in 3D spatial system. Thickness below this limit is considered as functional or non-existent.

It is highly improbable for a partition to form exactly in the center of a 1D quantum of matter, B, with even curvatures. Even so, slight motion of either 2D quantum of matter, A, or 1D quantum of matter, B, will offset the center point. Development of the 3D body, in thickness, is also not identical in either direction from the center point. This also can offset any centralized formation of the partition. Hence, we can say that the formation of partition, exactly at the center point of the 1D quantum of matter, with even curvature, is not probable. Therefore, it is very unusual for a quantum of matter to be bifurcated.

In figure 4, B represents part of a 1D quantum of matter. A represents part of a 2D quantum of matter or part of a 3D matter particle, intruding into spatial dimension of 1D quantum of matter, B. YY is the perpendicular to tangent on perimeter of 2D/3D matter body, parallel to 1D quantum of matter's body. Curvature of perimeter of 2D quantum of matter on either side of line, YY, is considered as of different values. Arrows RP and ED represent directions of self-constriction in matter content of quantum of matter, B. Due to curvature of part of 1D quantum of matter's perimeter, directions of self-constriction are not even on either side of line, YY. Horizontal components of self-constriction of either sides of line, YY, are in opposite directions. Magnitudes of their resultants on either side of line, YY, depend on the curvature of intruding part of 2D quantum of matter. Difference in resultant effort compel matter content of 1D quantum of matter, B, to move towards the part that has higher resultant effort. Usually whole matter content of 1D quantum of matter should move to one side of intruding entity before the intrusion can part 1D quantum of matter into two independent 1D quanta of matter.

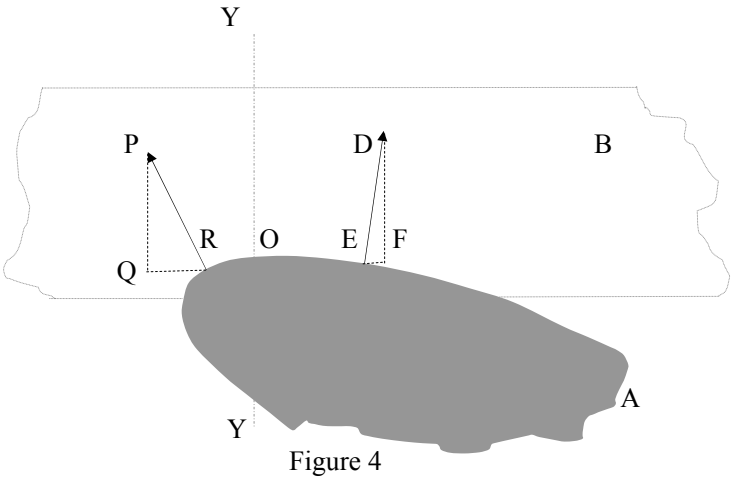

Figure 4

It can (generally) be said that quanta of matter preserve their individuality under all circumstances. However, in exceptional circumstances, nothing prevents a quantum of matter from parting into two independent matter bodies or amalgamation of matter contents from two quanta of matter to form single quantum of matter. If the attempt to part a quantum of matter into two may develop and persist for longer time at exactly at its geometrical centre with even curvature, the quantum of matter may part into two individual quanta of matter. Another possibility is that of a quantum of matter with exceptionally large matter content. Time required for an exceptionally large quantum of matter to move its whole matter content to the side with higher resultant effort may be too long to prevent division of its body into two separate quanta of matter.

A 1D quantum of matter exists only in its own one-dimensional spatial system. Hence, a 1D quantum of matter is able to coexist with another 1D quantum of matter in all spatial dimensions other than its own. A 2D quantum of matter exists in a plane. A 1D quantum of matter is able to coexist with it, in all spatial planes other than in the plane of 2D quantum of matter. When located in the plane of 2D quantum of matter, the 1D quantum of matter will maintain its individuality, even if it is a component of a 2D body, constituted by one or more 2D quanta of matter, without gaps between neighbouring quanta of matter. A 3D matter body exists in all spatial planes passing through the body. A 1D quantum of matter is unable to coexist with a 3D matter body or any of its constituent quanta of matter, in any of these planes. Even if the 1D quantum of matter is a constituent part of a 3D matter body, it will keep its independence and integrity as a separate entity, within the 3D matter body, without gaps between neighbouring quanta of matter.

Universal medium (in this concept) is a combination of 2D energy fields in all possible planes in space. A 2D energy field is a latticework formation by quanta of matter. Latticework structure is formed by grids in geometrical shapes of squares [like; grid formed by sets of parallel straight lines, perpendicular to each other], each side of a square is provided by a quantum of matter. As a result of this latticework structure, in each plane, spaces within latticework squares are free from matter content in that plane. However, such gaps in the plane (or any probable gap between two quanta of matter in the same spatial dimension) are occupied by quanta of matter in other spatial dimensions. This arrangement leaves no room

of void or empty gap in space. Entire space is occupied by matter. At the same time no overlapping or superimposing of matter contents of different quanta of matter takes place. Thus, matter-density of entire space (including that of 3D matter particles is the same as the matter-density of a quantum of matter or that of a basic 3D matter particle. This matter-density is constant throughout universal medium (space). Consequently, universal medium is homogeneous in its consistency. Due to 2D latticework structures of universal medium, matter-density, when considered separately for any plane, will show much larger gaps between quanta of matter in that plane (spatial dimension).

Anisotropy of universal medium:

Universal medium (structured by quanta of matter), in its stable state, is homogeneous, isotropic and serene. A homogeneous universal medium that has isotropic properties can neither deform nor have relative motions within its body. If the universal medium cannot have relative displacement of its parts, it can neither act nor be acted upon on/by other entities. Therefore, it is imperative that structure of universal medium (which may be of isotropic properties in its stable state) should be able to cater for anisotropic properties during its unstable conditions, while remaining homogeneous. For brief description on structure and properties of universal medium, see reference [3].

Relative motion within universal medium:

Space, outside 3D matter particles, is filled entirely by an all-encompassing universal medium of constant matter-density. It is of homogeneous consistency. Since, 3D matter particles are also of same matter-density, whole space is filled with a combination of entities of constant matter-density. In our 3D world, displacement of a body or its part can take place only to another location where there is no other 3D body present (or where matter-density is lower). Thus, it seems that relative motion or deformations in universal medium is impossible objectives to achieve.

As mentioned earlier, universal medium is a combination of 2D energy fields in all possible planes in space. A 2D energy field is a latticework formation by quanta of matter. In each plane, latticework structures of 2D energy fields leaves lot of space around their constituent quanta of matter, for their relative displacements. At the same time, bonds between quanta of matter in the latticework structures of universal medium are weak enough to allow angular displacement or departure between quanta of matter at a junction point. This facilitates relative angular displacement between quanta of matter in a 2D energy field. Latticework structures may be deformed and/or parted to facilitate motion and passage of 3D matter particles through them. Latticework structure enable universal medium to transfer deformations in it, even without presence of 3D matter bodies. Actions/deformations in all 2D energy fields about a point/body, in space, appear as action in 3D spatial system. This arrangement of 2D energy fields distribute matter evenly throughout entire space and at the same time make them free to deform without damaging universal medium's homogeneity (constant matter-density). Displacements of one or more quanta of matter (in any spatial dimensions) do not leave space occupied by them, empty. As same space is simultaneously occupied by quanta of matter in other spatial dimensions, no empty space or void appear in these places.

Initiation of motion:

Relative motions of quanta of matter (which in turn move 3D matter particles/bodies) in universal medium may be initiated by various means; few of which are given below.

Quanta of matter – the smallest matter particles in nature – are of different matter contents. Quanta of matter with somewhat equal matter contents form stable 2D energy fields. 2D energy fields are inherently under compressed state. Any entity, within 2D energy fields and breaking the continuity of their latticework structure will be under external pressure produced by compressive state of 2D energy fields. This phenomenon is 'gravitation' [2]. Due to latticework structure of 2D energy fields, gravitational efforts are applicable only on curved perimeters of 2D or 3D matter particles. Magnitude of gravitational effort at a point is proportional to extent of 2D energy field(s), applying the compression.

Inclusion of a quantum of matter with (much) higher or lower matter content, in latticework structure, causes imbalance and deformation that makes a 2D energy field unstable. Stabilizing act, inherent in 2D energy field, tends to move distortions in latticework structure, away from its present location and gradually group them together. Excessive deformation in a place in the latticework structure either produces circular 2D matter bodies by combining and compressing offending quanta of matter or causes

local breakdown of 2D energy field latticework structures.

Every 2D energy field extends to infinity in all directions in its plane. If there are two 2D matter bodies in a 2D energy field, extent of 2D energy field in between these 2D matter bodies is always less than extent of 2D energy field on their outer sides. Magnitude of gravitational effort is proportional to extent of 2D energy field (which is producing it). Therefore, magnitudes of gravitational efforts applied by smaller extent of 2D energy field in between two 2D matter bodies are lesser than magnitudes of gravitational efforts applied by infinite extent of 2D energy field on their outer sides. Consequently, these 2D matter bodies tend to be pushed towards each other. This phenomenon is the (apparent) 'attraction due to gravitation'. As and when, deformations in 2D energy field and resultant gravitational effort by 2D energy field about 2D matter particles are large enough; 2D energy field-distortions move the 2D matter particles towards each other by parting latticework structure in between them. It is the 2D energy field distortions, which are transferred. 2D/3D matter bodies are carried by the distortions along with them. Similar actions take place in cases of 3D matter particles also.

Excessive or sudden deformation in any part of 2D energy fields may cause breakdown of their latticework structures and release quanta of matter free, into the gap. 2D energy fields, all around the gap, rush in, to gather freed quanta of matter and compress them into a single 3D matter particle. Volumetric shape of this 3D matter particle induce surrounding 2D energy fields to assume appropriate deformations to re-shape gathered quanta of matter into basic 3D matter particle and move it linearly and angularly at characteristic and constant velocities through universal medium. It is the universal medium that is moving the 3D matter particle, by transferring deformations within its latticework structures. This, basic 3D matter particle, together with associated deformations in surrounding 2D energy fields is a 'photon'. Photons, with their matter bodies, associated deformations in 2D energy fields and characteristic properties form basis of all physical phenomena in our 3D world.

Distortions in 2D energy fields, in association with one macro body, may be transferred to 2D energy fields in association with another macro body to transfer kinetic energy from one macro body to another.

Conclusion:

Universal medium, envisaged in 'Hypothesis on MATTER', has all required properties of ideal aether, in 'aether theories'. It is made of matter. It is a real entity. It encompasses all 3D matter particles. It fills the space entirely. It extends in all directions to infinity. It is homogeneous with constant matter-density everywhere. It can become anisotropic in unstable (deformed) state, without losing its homogeneity to facilitate relative motions. In its stable state, the universal medium is homogeneous, isotropic and serene. Separate 2D latticework structures by quanta of matter (which may co-exist in space) for each plane of universal medium, enables it to be homogeneous and anisotropic at the same time.

Reference:

References are self-published by the author. They are neither reviewed nor edited.

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