QUANTUM OF MATTER

(According to 'MATTER (Re-examined)')

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Abstract: Matter is the only substance that can provide real existence to a body in nature. Since matter is the constituent of all real objects, it has to exist in a form much smaller than the smallest real physical object in nature. An alternative concept, proposed in the book 'MATTER (Re-examined)' logically explains all physical phenomena on the basis of a single assumption that matter exists. Pure matter exists in nature in the form of tiny bits, called 'quanta of matter'. Diverse matter bodies, including an all-encompassing universal medium, with assorted properties and their interactions, are results of various combinations of 'quanta of matter'. This article gives a brief description of the 'quantum of matter', as postulated in the book 'MATTER (Re-examined)'.

Keywords: Matter, entity, substance, quantum of matter, spatial dimensions, Hypothesis on MATTER.

Introduction:

All real entities have substance. Substance provides them with objective reality and positive existence in space. A real entity is a thing with distinct existence. It has existence in itself. A place that contains a real entity is usually understood as space. Space is an imaginary functional entity, presupposed by rational beings whenever they think of a real entity.

A rational living being perceives its surroundings or parts of its own body by identifying them. Perception is achieved by analysing information from the sense organs and comparing it with images stored in the mind. A perceived entity has a distinct but separate existence from the perceiver (his mind). An entity may be real or imaginary. However, perception of real entities is aided by sensory perception. An entity that can be perceived by the senses is tangible and is relatively stable in its form is a real object or real entity.

For our convenience in defining the location of an entity or its part, we divide the imaginary space into different parts about a point of origin. The most convenient and widely used method is to divide the space into eight parts by using three mutually perpendicular planes through a point of origin, which gives us the three-dimensional spatial system. Distances to different points on an entity in space from each of these planes gives us its accurate location by defining length, breadth, and depth (thickness). We are 3D entities. All of our senses and instruments are devised for the perception of real entities only in a 3D spatial system. A real entity exists in the 3D space, and occupies a volumetric space. In its 3D state, we can observe matter. If the dimensional measurement of a material body is less than the observable limit in any or all spatial dimensions, despite it being a real entity, we will not be able to observe it, but this does not make the entity unreal or functional. The whole of our observable universe is made of 3D material bodies.

'Actions at a distance through empty space' is an illogical concept. Direct contact between two 3D material entities is essential for their interaction. This can also be accomplished through an intermediary that is in direct contact with both of them. Such an intermediary should fill the entire space outside the most basic 3D matter particles. If a universal medium is formed by matter in their hidden states, the universal medium and its actions remain hidden from us, while we will be able to observe the results of all its actions on the 3D material entities. A universal medium structured by matter and filling the entire space is a real entity that can substitute for the imaginary space.

In the material world, the existence of matter is closest to absolute truth. Hence, it is logical to conclude that matter alone provides substance to all real entities. As there are numerous material entities in nature, matter has to exist in the form of very small particles, much smaller than the smallest material particles observed by us and their combinations. These smallest bits of matter may be called the 'quanta of matter'. The quanta of matter, in different combinations, form all other real entities in nature. Matter, being a single type of entity, cannot provide diverse properties to different kinds of objects in nature. Hence, the matter particles can have no other property except their ability to exist, and different properties of diverse objects need to be the result of a particular arrangement of the quanta of matter in them. Matter is the same, in whichever form it appears. Hence, matter that forms the observable 3D material entities and the hidden universal medium should have a common fundamental existence in the form of quanta of matter. They have objective reality in space and should constitute the hidden universal medium as well as the observable 3D material entities.

Logically, every entity has to be created or developed from its predecessor particles. Hence, it is essential that all real entities, including the universal medium, are created or developed from the quanta of matter. As the universe is infinite in all its parameters, there should be an unlimited quantity of quanta of matter in nature. All actions and effects have to originate from the quanta of matter, and they should have preceding causes. All causes should be followed by effects. Matter provides substance to all real entities. A three-dimensional matter particle contains matter without voids in it. Whole space, occupied by a 3D matter particle, is occupied by matter. The real universal medium is also made up of matter. The universal medium fills the entire space outside the most basic 3D matter particles. There are no voids in it either.

In order to satisfy these requirements, the matter-density of a 3D matter particle and the matter-density of the universal medium (outside the basic 3D matter particles) have to be the same. Hence, the entire space (the universal medium along with 3D matter particles in it) should form a single block of matter of uniform matter-density and of infinite extent and volume. Matter cannot be compressed beyond the matter-density of a 3D matter particle or that of the universal medium. A material body of zero volume and infinite mass (singularity) is impossible to achieve.

Quantum of matter:

The ability of matter to exist implies that every point within the matter content of a quantum of matter (or of a larger block of unstructured matter) tends to stick together—a quality similar to adhesion (only) between the nearest points. Two inherent characters of matter, derived from its self-adhesion, are 'self-constriction' and 'self-elongation'. The property 'self-constriction' compels a bit of matter to restrict its existence in minimum spatial-dimensional systems. 'Self-elongation' compels a bit of matter to grow (revert) into a lower spatial-dimensional system from its present state until it reaches a single-dimensional state by lengthening out as far as possible. These properties squeeze the matter content of a 3D bit of matter towards its central plane to reduce its thickness or (in the case of a 2D bit of matter) to lengthen out along its major axis in a plane to reduce its width. A large block of pure matter automatically furcates into numerous quanta of matter, each of them inherently seeks to exist in a 1D spatial system.

A quantum of matter is an independent matter particle. In its natural free state, it is a single-dimensional object with only the length as its tangible measurement. Its length may be reduced by its body growing in width and thus developing into 2D space until it becomes a circular object. The area of a two-dimensional quantum of matter may be reduced by its body growing in thickness, and developing into 3D space. Unfortunately, the length of a quantum of matter, even in its one-dimensional state, is so small that none of our 3D scales are able to measure it directly. No other regular entity exists to control or regulate the physical parameters of this most elementary entity. Generally, it maintains its individuality under all conditions. As there is no mechanism to regulate uniformity of their matter-contents, magnitudes of matter-contents in different quanta of matter may vary from one to another. Dissimilarity in the magnitudes of matter-contents of quanta of matter is an essential factor for the creation of our 3D material world. The matter-content of a quantum of matter has the same affinity towards the matter-content of any other quantum of matter that is in direct contact with it. When two quanta of matter are in contact, their matter-contents tend to merge. Since these quanta of matter are separate and individual bodies, their matter-contents cannot merge to form a single unit. If bodies of quanta of matter are at an angle to each other in different planes, they can co-exist without mutual interference, as described below.

Each quantum of matter is a separate entity that always keeps its single-body identity. Cohesion within the matter- content of a quantum of matter helps to maintain its individuality/separation from other quanta of matter, which are in direct contact. Even without the help of a specialised border or skin, a quantum of matter can maintain individuality and independence of its matter-content.

A free quantum of matter being free in the space where it can lengthen out up to its limit is only a hypothetical consideration. As far as a single quantum of matter is concerned, there is no unlimited 'free' or 'empty' space. [Distance is a measure of separation between matter particles or bodies in space. A single or free quantum of matter has no other material body as a reference]. By postulating the quantum of matter, the matter-content of a composite body (a union of more than one quantum of matter) is quantified in terms of their numbers. Only an addition or subtraction of integral numbers of quanta of matter can change the total matter-content of a 3D material body. Due to possible variations in their matter-contents between different quanta of matter, the magnitude of total matter-content of a 3D material body may not be strictly proportional to the number of quanta of matter in the body.

The matter density throughout the universe is the same irrespective of the fact of its existence in various forms. Matter is neither compressible nor expandable. Due to differences in their matter-contents, different quanta of matter may have different body measurements in different spatial dimensions, and they may exist in different spatial dimensional states. 3D matter particles are made solely of quanta of matter. Entire space (outside the basic 3D matter particles) is filled with quanta of matter in definite structural formations. There are no gaps. Any probable gap in space is immediately filled up by the universal medium, which is made of quanta of matter.

Nature of quantum of matter:

A quantum of matter has a natural tendency, necessitated by the adhesive property of its matter-content, to grow in its own single spatial dimension. If left free in free space, a quantum of matter will grow in length indefinitely (to the maximum possible extent) while reducing measurements in other spatial dimensions. Even though the spatial dimensions of a quantum of matter, other than its single spatial dimension, are negligibly small, a free quantum of matter is a one-dimensional material body with objective reality and positive existence in all spatial dimensions. It has a body and two ends.

Reducing the length of a free quantum of matter by external efforts compels it to grow into the second spatial dimension. External pressure from the ends of a 1D quantum of matter can reduce its body measurement in the first spatial dimension and cause its material body to grow into the second spatial dimension (in width) until its body shape becomes a perfect circle in a plane, forming a 2D quantum of matter. Similarly, if identical external pressure is applied all around the periphery of a 2D quantum of matter in the plane of its existence, its material body is compelled to grow into the third spatial dimension while reducing measurements in the other two spatial dimensions. Growth into the third spatial dimension (in thickness) will continue until its shape becomes a perfect sphere. As soon as a quantum of matter grows into its third-spatial dimension, it becomes a 3D material 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 the 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. If left free in free space, a quantum of matter may (theoretically) grow in length indefinitely.

The 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 its matter-content]. As matter is its substance, irrespective of its negligible body measurement(s) in any spatial dimension(s), 3D rational beings will be able to sense or observe them only when they are in a 3D spatial state. A quantum of matter can express its individuality only in the spatial dimension(s) of its existence. 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. Since a quantum of matter has objective existence in its spatial dimension, no other quantum of matter can occupy its space, in whichever spatial-dimensional status it may be. Two quanta of matter in different spatial dimensions have objective reality in different spatial dimensions. 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 coexist at the point(s) occupied by both of them.

The matter-contents of quanta of matter have no substructures. They are homogeneous and isotropic. Two 1D quanta of matter occupying the 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 each other's existence. Since two quanta of matter are in different planes (spatial dimensions) and crossing each other at a point in space, they do not intrude into each other’s spatial dimensions. Due to a 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 coexist with a 2D material body (its thickness is zero) in different planes. However, as all spatial dimensions are occupied by a 3D material body, a quantum of matter will be unable to coexist with a 3D quantum of matter in space. It will have to remain outside the 3D material body.

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 except its own plane. If located in the plane of a 2D quantum of matter, a 1D quantum of matter will maintain its individuality and independence as a separate entity, even if it is a component of the 2D material body, constituted by more 2D quanta of matter. A 3D material body exists in all spatial planes passing through the space of its body. A 1D quantum of matter is unable to coexist with the 3D material 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 the 3D material body, it will keep its independence and integrity as a separate entity within the 3D material body.

Interactions are possible only between quanta of matter, existing in the same spatial dimension(s) and in direct contact with each other. The property of self-adhesion in the matter-contents across points of contact between two quanta of matter encourages their matter-contents to merge and form a single quantum of matter with greater matter-content. However, due to various reasons, the points of contact between two quanta of matter are never steady, and therefore the magnitude of adhesive effort between two separate quanta of matter through their point of contact is less than the magnitude of adhesive effort between the nearest points within the individual quantum of matter. This difference in the magnitudes of adhesive effort prevents the merger of their matter-contents while preserving the integrity of individual quanta of matter.

Although quanta of matter in their 1D status are real material bodies with positive existence in all three spatial dimensions, 3D rational beings are unable to appreciate their real existence in a 3D spatial system. Their measurements in all spatial dimensions are too small to be tangible by the scales used in the 3D spatial system. In its one-dimensional status, its measurements in all higher spatial dimensions are negligible compared to its length.

Change of physical states:

Since a quantum of matter is a single body, its matter-content spreads evenly within its body limits. The matter-content of a quantum of matter has a constant matter density that is the highest matter density any material body may have (in any spatial dimension), and it is invariable. Compression on a quantum of matter changes its shape by its matter-content growing into higher spatial dimensions rather than changing its matter density.

Affinity, producing the attraction within the matter-content of a quantum of matter or between quanta of matter in contact, is directly between the nearest points in continuous matter-content. It does not depend on the extent of matter-content between the points considered. Since there are no external agencies in the space between the nearest points in matter-content, distance between the points is not a factor to determine the magnitude of attraction within the matter-content, either continuous or in contact. As long as the matter-content is continuous, the magnitude of (apparent) attraction within the matter-content is constant between any two points. The continuity of matter-content within a single quantum of matter is due to its single-body existence. The continuity of matter-content between neighbouring quanta of matter is due to their direct physical contact.

Consider three adjacent points A, B, and C in a straight line at equal intervals within the matter-content of a quantum of matter; point A being on the periphery of the quantum of matter. Affinity within the matter-content produces (apparent) attraction between these points. Attraction exists between points A to B, B to A, B to C, C to B, and C to the next point in the straight line, and so on. The magnitudes of all these (apparent) attractions are equal. (Apparent) attractions on point C and point B in opposite directions neutralize. Since (apparent) attraction between A and B has no opposition to neutralise, it alone is left in the system as a resultant (apparent) attraction. Similarly, all points on the periphery of a quantum of matter have inward acting (apparent) attraction on them. A very small part of a curve is a straight line. Since a point is much smaller than a small part of a line, a point on this part of the line is situated on a straight line.

Consider (apparent) attraction emanating from a peripheral point on a quantum of matter towards other points in the matter-content in different directions. Each of these (apparent) attractions may be resolved into two components, one parallel and the other perpendicular to the periphery. Since the components parallel to the periphery are in opposite directions and equal in magnitude, they neutralise each other. Components of (apparent) attraction perpendicular to the periphery add up to form a resultant radial (apparent) attraction towards the centre of matter-content. Thus, the coagulating tendency of matter-content produces an inward-acting (apparent) attraction on every point on the periphery of a free quantum of matter in a direction perpendicular to the periphery. This (apparent) attraction is effective only between adjacent points within its matter-content. Inward-acting (apparent) attraction all along the periphery of a quantum of matter acts as an effective skin all around the quantum of matter.

In figure 1, let the circle in red dotted line indicate a (2D) quantum of matter in its critical equilibrium in the 2D spatial system. Coagulating effort, AB, from the point A on its periphery acts towards the centre of the circle, O. Efforts on all points on its periphery may be resolved into two parts. One part of (apparent) attraction acts towards the coordinate axis, XX, and the other part acts towards the coordinate axis, YY. Since the quantum of matter is in a circular shape, components of (apparent) attractions from all points on its periphery balance each other, and there is no resultant displacement of its matter-content.

Let the periphery of a 2D quantum of matter be distorted to an elliptical shape as shown by the grey line. Consider the coagulating effort at point D on its periphery. Due to distortion of the shape of the quantum of matter, the direction of (apparent) attraction (being perpendicular to the periphery) is no longer towards the centre, O. The direction of resultant (apparent) attraction at the point D is along DE, perpendicular to the periphery. This (apparent) attraction may be resolved into perpendicular components: DF, directed towards axis XX, and FE, directed towards axis YY. Magnitudes of components of (apparent) attraction, directed towards axis XX, are greater than the magnitudes of components of (apparent) attraction, directed towards axis YY. As a result, the quantum of matter acquires a tendency to shrink towards axis XX and expand away from axis YY. As the matter-content cannot be shrunk, the area of the 2D quantum of matter has to remain constant. The quantum of matter contracts towards the XX axis and elongates along the XX axis at an increasingly rapid rate until it reaches its 1D spatial state with the highest possible length and negligible measurements in other spatial dimensions. In this manner, a free quantum of matter that may be in its critical equilibrium state in 2D status will revert back to its 1D state at the slightest provocation.

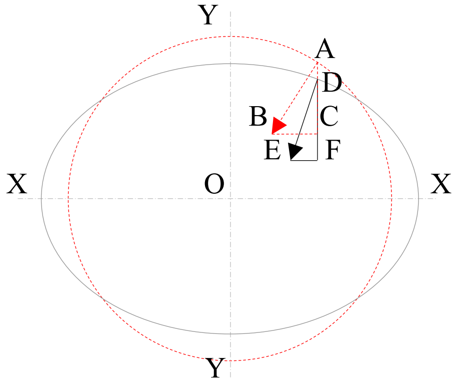

Figure 1

In a circular (spherical) 3D macrobody (which we normally encounter in nature), the action of inward (apparent) attraction is governed by the magnitudes of efforts in different directions. Magnitudes of (apparent) attraction are proportional to the number of 3D matter particles (distance) in a line. As the macrobody is distorted to an elliptical shape, the number of 3D matter particles along its major axis increases. Correspondingly, the magnitude of (apparent) attraction in this direction is also increased. Actions of (apparent) attractions in all directions tend to restore the circular (or spherical) shape of the body. Actions of mutual (apparent) attractions in a 3D macrobody and actions of (apparent) attractions within the matter-content of a quantum of matter are different.

Magnitude (of property) of self-constriction effort is inversely proportional, and magnitude (of property) of self-elongation effort is directly proportional to the curvature of the periphery of a quantum of matter. In the process of conversion to higher spatial dimension, depending on the points of external pressure, a quantum of matter may assume different geometrical shapes. Changes in its geometrical shape are the result of the quantum of matter having contacts with different external quanta of matter. A quantum of matter, having a different geometrical shape, has more ends or corners than a quantum of matter in a (hypothetical) circular shape. Each end has the property of self-elongation, with the magnitude of effort proportional to its curvature. A greater number of ends (projections from the body) in a quantum of matter increases its total self-elongating action. Increased curvature at an end point also increases the self-elongation effort. In geometrical shapes with straight sides, corner points have very high curvature. This also increases the self-elongating efforts in a quantum of matter.

Reversion of a 3D quantum of matter into its 2D state is also similar. A hypothetical 3D quantum of matter in its free state is spherical in shape, and it is in critical equilibrium. It would have (hypothetical) equal compression from all sides on its periphery. A small distortion to its spherical shape automatically initiates its reversion from its 3D state to its 2D state or from its 2D state to its 1D state. Perpendicular to the plane, where the distortion in a 3D quantum of matter is initiated, will become the plane of the converted quantum of matter in its 2D state. Similarly, the line perpendicular to the diameter of a 2D quantum of matter, where its distortion is initiated, will become the axis of the converted quantum of matter in its 1D state. Action of an external effort is required to convert the quantum of matter to its higher spatial dimensional states, but removal of external efforts automatically reverts a quantum of matter to its lower dimensional status.

As external pressure on a hypothetical, free 3D quantum of matter is lowered, a pressure difference is felt first in any one of the planes passing through its body. Let us call this plane a ‘reference plane’. The reduction in external pressure initiates reversion of the 3D quantum of matter into the second spatial dimension. Since there is a difference in the external pressure in the reference plane with respect to other planes, matter-content of the 3D quantum of matter is squeezed to spread out in this plane of lower external pressure. The sphere of matter-content will now bulge outward in the reference plane. The perimeter of the sphere, in all other planes, will become flatter. Flatter perimeter segments have lower curvature and reduce the magnitude of the required pressure difference between external and internal pressures. As the external pressure on a 3D quantum of matter is gradually reduced, it will continue to grow in the reference plane and shrink in all other planes until the quantum of matter becomes a circular disc of negligible thickness in the reference plane. Now the quantum of matter is a 2D object.

Co-existence of quanta of matter:

A quantum of matter has definite matter content. Matter is continuous and incompressible. Since matter is the substance, a quantum of matter has objective (real) existence in space. A quantum of matter can express its individuality only in spatial dimension(s) of its existence. No two real entities can 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 can coexist at that 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 two-dimensional. 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 single-dimensional. 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.

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 common points occupied by both. That is, quanta of matter, in different spatial dimensions, should be able to co-exist at common points of existence.

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. Two 1D quanta of matter occupying the same point in space, essentially, have to be at an angle to each other. Their negligible widths (as and when developed) have to be in different planes. Since quanta of matter are 1D objects, they cannot extend into each other's spatial dimension so as to create discontinuity for the 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. Similarly, a quantum of matter can also co-exist with a 2D material body (its thickness is zero) in different planes. However, as all spatial dimensions are occupied by a 3D material body, a quantum of matter will be unable to coexist with a 3D quantum of matter. It will have to remain outside 3D 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. Another 1D or 2D quantum of matter may coexist with it in all spatial planes other than its plane. When located in the plane of a 2D quantum of matter, the 1D quantum of matter will maintain its individuality and independence as a separate entity, 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 material body exists in all spatial planes passing through it. A 1D quantum of matter is unable to coexist with a 3D material 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 material body, it will keep its independence and integrity as a separate entity, within the 3D material body, without gaps between neighbouring quanta of matter.

Consider water contained in a vessel whose horizontal cross section is shaped as a cross. The water body contained in the vessel may be regarded in five separate parts, one part in each of the arms and another part at the centre of the vessel. Let us consider water body contained in each set of arms, in a straight line, as separate 3D matter bodies. Part of water, at the center of vessel, belongs to 3D material 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 centre of the vessel can act as parts of both 3D material bodies. Even if the water in the vessel is frozen, the case will be the same.

Now, let us reduce the widths of the vessel's arms. Water in the central part of the vessel will continue to be part of 3D material bodies in both sets of arms until the widths of one or both sets of arms are reduced to the size of a water molecule. If the widths of one or both sets of arms are reduced further, the water molecule at the centre of the vessel will no longer be able to simultaneously be parts of both 3D material bodies, contained in straight-line sets of arms of the vessel. It will be part of either of the 3D material bodies. At this stage, 3D material bodies in both sets of arms will no longer be able to coexist at the centre. The inability of these 3D material bodies to coexist is due to the substructure of water molecules. Substructures of molecules or atoms require that each molecule or atom can have only a particular formation with its neighbours. If this particular type of formation can be preserved by the molecule/atom at an intersection, any number of 3D material bodies can coexist in space. However, as each type of atom/molecule is unique, this is not practical in cases where the thickness of 3D material bodies approaches very small values. Hence, it is impossible for two 3D material bodies to coexist at a point in space.

Let us consider two (hypothetical) free 1D quanta of matter in different spatial dimensions and whose matter

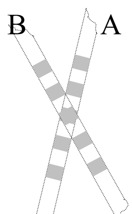

Figure 2

bodies pass through a point in space, as shown in Figure 2. Spatial dimensions of quanta of matter in their 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 2, the 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 grey. 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 another. Consistency of matter content (and matter density) at the intersection will be the same as it is for the rest of the quanta of matter.

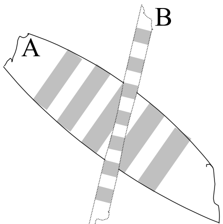

Figure 3

1D quanta of matter, shown in figure 2, 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 the 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 the major axis of the matter content) give the quantum of matter A one definite border (as shown in figure 3 by bold curved lines) to become a 2D quantum of matter. As both quanta of matter occupy the same spatial dimension, during its development into a 2D quantum of matter, quantum of matter A tends to partition 1D quantum of matter B into two. But the borders of 2D quantum of matter A will now provide anchoring points for self-adhesion of quantum of matter B to withdraw all its matter content to one side and exit from the space occupied by quantum of matter A, which has developed into its second spatial dimension. Similar action occurs during the change of a 2D quantum of matter into a 3D entity.

Figure 4 shows a representation of two intersecting quanta of matter. Quantum of matter B is in its 1D spatial status. Its matter content cannot be compressed any further in width and thickness. Its upper end (as shown in the figure beyond quantum of matter A) is much longer than the lower end. Quantum of matter A is at the instant of conversion of its spatial status from 1D to 2D, in the plane of the paper. As external pressure at quantum of matter A overcomes its self-elongation, quantum of matter A increases its width. Increasing self-constriction of its matter content forms a 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. The reduction of width, shown in the figure, is symbolic and highly exaggerated. It represents directions of effort transmitted to quantum of matter B (shown by thin arrows) through the quantum of matter A from external pressure at its ends.

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

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. For the same effort, the development of internal pressure in a larger volumetric space will be slower than in a smaller volumetric space. Hence, usually, matter content at the larger end of the quantum of matter B will have lower internal pressure during its development. This will encourage the matter content of quantum of matter B to move towards the longer end.

Formation of a partition, slightly away from the centre point of a quantum of matter B with uneven curvature, produces an imbalance in self-constriction and self-elongating efforts within the 1D quantum of matter B towards its

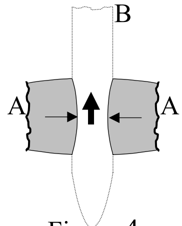

Figure 4

ends. The longer part may have higher self-elongating effort and lower self-constriction, and the 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, the 1D quantum of matter B, as a whole, will experience a resultant translational 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 a 2D/3D body within its spatial dimension.

External pressure, at the ends of quantum of matter A, affects its matter content at every point and induces it to expand in the second spatial dimension and shrink in the first spatial dimension. Points in the matter contents, which are common to both quanta of matter and exist at their intersection, are also affected similarly. Certain parts of their expansion in the second spatial dimension of quantum A may coincide with the translational motion of matter content in quantum of matter B. The 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 the same spatial dimension(s), their matter contents separate into independent statuses to form quanta of matter in their respective spatial dimensions and outside each other's bodies.

Let an external pressure act all around the perimeter of the 2D quantum of matter A such as to convert it into a 3D material body. The existence of a 3D material body at the point of intersection of 1D quantum of matter tends to part the 1D quantum of matter into two parts. However, by the quantum of matter's inherent nature, it is unusual for the 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 are proportional to the curvature and length of parts forming, as explained above with respect to figure 5. [If the 1D quantum of matter is already a part of a quanta-chain, attraction to its neighbours will also be proportional to the length of the parts of the 1D quantum of matter B being formed.] The thickness of the 2D quantum of matter A at the instant of its conversion to a 3D body corresponds to the thickness of a plane in the 3D spatial system. Thickness below this limit is considered functional or non-existent.

It is highly improbable for a partition to form exactly in the centre of a 1D quantum of matter B, with even curvatures. Even so, a slight motion of either of the quanta of matter will offset the centre point. The development of the 3D body, in thickness, is also not identical in either direction from the centre point. This can also offset any centralised formation of the partition. Hence, we can say that the formation of a partition, exactly at the centre 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 5, B represents part of a 1D quantum of matter. A represents part of a 2D/3D quantum of matter or part of a 3D matter particle, intruding into the spatial dimension of the 1D quantum of matter B. Line YY is perpendicular to the tangent on the perimeter of a 2D/3D material body, parallel to the 1D quantum of matter's body. The curvature of the perimeter of 2D/3D quantum of matter on either side of line YY is considered to have different values. Arrows RP and ED represent directions of self-constriction efforts in the matter content of quantum of matter B. Due to the curvature of part of the 1D quantum of matter's perimeter, directions of self-constriction efforts are not even on either side of line YY. Horizontal components of self-constriction efforts on either side of line YY are in opposite directions. The magnitudes of their resultants on either side of line YY depend on the curvature of the intruding part of the 2D/3D quantum of matter. Differences in resultant effort compel the matter content of 1D quantum of matter B to move towards the part that has higher resultant effort. Usually, the whole matter content of a 1D quantum of matter should move to one side of the intruding entity before the intrusion can divide a 1D quantum of matter into two independent 1D quanta of matter.

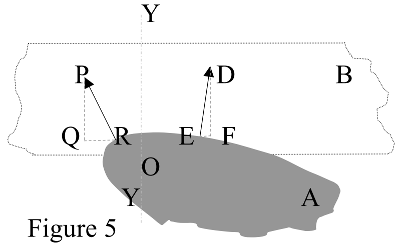

Figure 5

The matter content of a quantum of matter is a wholesome body. It cannot amalgamate into the matter content of another quantum of matter. Adhesion within the matter content of a quantum of matter keeps it as an independent body from other quanta of matter with which it is in contact. We may consider that matter content within a quantum of matter is a fused material body with respect to matter contents of other quanta of matter in contact. 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 a single quantum of matter. If the attempt to part a quantum of matter into two develops and persists for a longer time (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 (of a parting intrusion) with higher resultant effort may be too long to prevent division of its material body into two separate quanta of matter.

Properties of a quantum of matter, postulated as the most basic entity and forming the foundation of this concept, may be tabulated as follows:

1. Quanta of matter are incompressable/indivisible basic matter particles. They can neither be created nor destroyed. They exist perpetually. They have constant matter-density.

2. A quantum of matter, in its 1D state, has a body and two ends. Once formed, it keeps its single-body identity under all conditions. Matter-content of a quantum of matter coagulates to be a single body. This provides a quantum of matter with its self-adhesive nature.

3. When free, a quantum of matter exists in its single-dimensional spatial system. Its body extends in its own spatial dimension so that the body's measurements in all other spatial dimensions are negligible (reduced to zero). Self-constriction and self-elongation are inherent natures of quanta of matter.

4. External compression from the ends of a quantum of matter may reduce its length and compel it to grow into the second-spatial dimension. External compression, all around the perimeter of a 2D quantum of matter, may reduce its area and compel it to grow into the third spatial dimension and so on.

5. Two quanta of matter, in contact, attract each other and they tend to line up in the same spatial imension so that they form a chain in a straight line. Development of quanta-chain keeps constituent quanta of matter under compression from their ends.

6. There are infinite numbers of quanta of matter in nature. They arrange themselves to form latticework structures of universal medium in all directions in all possible planes (2D energy fields) to fill entire space. A single quantum of matter has no stable, independent existence in a 3D spatial system.

7. Dimensions of a quantum of matter are so small that it exists and acts as a functional entity with respect to 'rational 3D beings'.

8. Matter contents of all quanta of matter are not equal. Quanta of matter, which have nearly equal matter contents, form universal medium (2D energy fields), and others create disturbances in universal medium.

9. Quanta of matter in various combinations form all other material bodies in nature, including all-encompassing universal medium. Diverse characteristic properties of material bodies are extensions of the adhesive property of matter content in the quanta of matter.

Conclusion:

'Quantum of matter', described above, has a vague resemblance to the 'strings' in 'string theories'. It should be noted that the quanta of matter are distinctly separate from the proposed 'strings'. The only resemblance is that both are postulated basic entities. A string is assumed to be a vibrating particle of undefined 'energy' in space, which forms various matter particles in accordance with the frequency of its vibrations. What is vibrating or how does it vibrates are left to the reader's imagination. Unlike the string, a quantum of matter is a real matter particle with positive existence in space, which may be transformed to exist in any of the spatial dimensional systems by (or lack of) external efforts. It is a physical object that remains intangible and unobservable only due to the inability of 3D rational beings to do so. Other than its inherent property to elongate in its own dimension and the tendency to form one-dimensional chains with similar bodies in contact, it is inert and incapable of any other motion or interaction on its own.

Reference:

Reference is self-published by the author. It is neither reviewed nor edited.

[1] Nainan K. Varghese, *'MATTER (Re-examined)'*.

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