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(According to "*Hypothesis on* MATTER")

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Abstract: Space is a functional entity, presupposed by rational beings, whenever real entities are envisaged. Being a functional entity, space has no structure or form. It can neither physically act nor is able to undergo physical actions. By realising a real entity that fills the entire space as an all-encompassing universal medium, the formless space can be replaced with a structured real entity. This real entity will have positive existence and at the same time, it can have all properties currently assigned to space or to other imaginary entities like; different types of aether, imaginary particles or various types of fields. No actions can be performed at a distance through empty space. An all-encompassing medium is essential to facilitate (apparent) physical actions between matter bodies at a distance. Aether, used in aether-theories is too vague and fails to describe many physical actions of matter bodies, logically. 'Hypothesis on MATTER' envisages an all-encompassing medium, which has only one type of real (postulated) constituent particles and definite properties. Envisaging a universal medium, as described in the concept, helps to logically explain all physical phenomena, related to matter.

Keywords: Space, aether, fields, ether, universal medium, quantum of matter, matter, 2D energy field, matter field, distortion field, disturbance, effort, force, Hypothesis on MATTER.

Introduction:

'Action at a distance through empty space' is the worst assumption in physics. Rational thoughts suggest an all-encompassing medium, which fills the entire space, including inter-particle spaces within macro bodies. So far, all proposals, suggesting such a medium failed to stand scrutiny. Past proposals, suggested in various aether-theories, assumed that the medium fills the entire space and all matter bodies are immersed in it. All actions were attributed to matter bodies, whose actions would affect other matter bodies through the medium. These assumptions required that the medium should have certain properties. These properties, when taken together often contradicted themselves. Although, efforts (forces) could be transmitted through the medium, matter bodies were assumed to move in relation to the medium. Relative motion (between the medium and matter bodies) raised the question of friction between the medium and matter bodies, moving in it. This culminated in the assumption that a moving matter body, in the medium, experiences certain friction (or drag) to its motion. Many attempts were made to determine such drag, until the experiment to determine aether-drag on earth's motion in space failed to show any tangible results. Failure to determine 'aether-drag' temporarily put an end to further search for an all-encompassing medium and we have returned to the illogical assumption of 'action at a distance through empty space'.

However, in many of our theories, we still use vague forms of a universal medium – various types of fields, imaginary particles, space with physical characters, etc. These fields or entities have no particular structure or properties. Each type of field or entity is associated with a particular phenomenon. They are mainly used in analytical explanations to indicate the region of influence of a phenomenon, in space. Lines of forces in these fields facilitate better analytical understanding of a phenomenon.

This article attempts to summarise a revolutionary proposal for an all-encompassing universal medium, from the book 'Hypothesis on MATTER' [1]. Universal medium, suggested in this concept, has definite structure and properties. It is made up of (real) matter and fills the entire space outside 3D matter particles. It has the same matter density as the matter density of basic 3D matter particle, yet it behaves like a perfect liquid to the relative motions of 3D matter bodies. It causes no friction to moving 3D matter bodies but acts as an all-encompassing medium for all apparent interactions between 3D matter bodies. Above all, it is this universal medium that creates and sustains 3D matter particles out of disturbances, developed in it. It doesn't interfere with any apparent actions on/of 3D matter bodies because this medium itself produces all such actions rather than the matter bodies. This universal medium inherently seeks serenity in nature. All statements, made in this article, are logically explained in the book [1].

Space:

Space is treated differently in different aspects. In physics; the space is understood as the boundless three-dimensional extent of universe, where all material objects and organisms (including rational beings like ourselves) exist and in which objects and events occur. All material objects in the universe have their relative as well as absolute positions and motions in the space. Space, itself, has no material existence. It cannot provide sensory experience to rational beings. It is a functional entity that serves the purpose of locating various material bodies in it and where rational beings relate themselves with each other. The extent, outside (3D) material bodies, becomes the space.

Perception is a process by which living organisms become aware of relative positions of objects around them (and of their own bodies). For perception, living organisms use data received by their sensory organs to conjure their own version of surroundings in their minds. This helps their orientation and activities with respect to surroundings. It aids individuals to understand their location in relation to other objects; with respect to direction, depth, distance, etc., which are important for accounting for various relative motions. In order to be perceived, an object has to be real, i.e. it should have positive (real) existence. With respect to three-dimensional rational beings, only 3D matter bodies can be implied to have positive existence. Only 3D matter bodies are tangible in 3D space system. Unlike functional entities, two or more (real) entities, with positive existence, can not exist in the same location in space. Space has no real form or structure. A body that has no form or structure cannot deform or distort. It can neither act nor be acted upon. Curvature, expansion or contraction of (structure-less) space, as used in some physical theories, are pure imagination which may aid mathematical exercises to prove illogical and mysterious physical laws.

All spatial concepts are related to contact-experiences of (matter) bodies by rational living beings. This has made it necessary to envisage an entity independent of all 3D matter bodies and yet embodying their locations. This entity, outside 3D material bodies yet enclosing them, came to be understood as space. When a rational mind envisages a real object, it logically pre-supposes a place for its existence. This is understood not by sensing such a place but by the necessity of a place for the existence for any real body to exist. This does not happen in case of functional entities, like; emotions. In this sense, the space appears to have a physical reality, which solely depends on the existence of 3D (real) material objects in it. As a result, the notion of space is somewhat incoherent because it professes to be a container that existed (logically) prior to its contents. Space turns out, in practice, to be merely an indefinitely extensive collection of its contents – the 3D matter bodies. Everything that occupies space falls within this wider spatial context. Space denotes a property, by virtue of, which different 3D matter bodies occupy different positions in the universe. The possibility of arranging an unlimited number of 3D matter bodies next to one another denotes that the space is infinite in its extent. However far one can go, 3D matter bodies are present there and beyond.

There is no logical argument for a definition of space based on these types of concepts. That is why, from early time, it was believed that a real entity, namely (different kinds of) aether, filled the entire space. In such theories, aether replaced the space by filling it entirely. Therefore, all properties assigned to the

functional entity of space could be the properties of aether, a real entity. Although the aether had an ambiguous form but it was regarded as a real entity. Since the aether was real, it could deform, move or otherwise interact with other 3D material objects. Unfortunately, no one could describe a satisfactory structure or properties for any of the different kinds of aether, proposed. Different types of aether were envisaged at different times in the past. The aether was assumed to be weightless, transparent, frictionless, chemically or physically undetectable, and literally permeating all matter and space.

'Aether theories' met with increasing difficulties as the nature of light and the structure of matter became better defined, even if it was on imaginary basis. Since there is no accepted definition of aether, scientists concentrated their effort to find and measure an effect, the aether may make on other 3D macro bodies. For this they assumed, when a large macro body moves through the aether, the macro body should essentially experience a drag due to the friction between the two. Aether theory was seriously weakened (1881) by the Michelson-Morley experiment, which was designed specifically to detect resistance to the motion of the Earth through the ether. Experiments showed that there was no such tangible effect. Finally, when aether's existence could not be proved experimentally, by experiments based on illogical theories, majority of scientists abandoned the concept of (real) aether. They returned to more mysterious concepts of space and fields.

Everyday experience of natural phenomena shows mechanical things are moved by contact between a 'force-applying body' and a 'force-receiving body'. Thus, logically, we came to conclude that for any action to take place between two real 3D matter bodies there must be a contact between them. Nature of this contact is expressed as action of an effort (force) between these bodies. Any 'cause and effect' without a discernable contact between participating 3D matter bodies, or an 'action at a distance through empty space,' contradicts common sense and has been an unacceptable notion since earliest of time.

Aether (currently expressed as various types of fields, force-carrying particles, concentrated forms of energy, imaginary entities with negative existence, etc.) was discovered during the heyday of aether-theories. According to which all space is permeated by a medium capable of transmitting efforts (forces) between 3D matter particles. The electric and magnetic fields were interpreted as descriptions of the state of strain/stress of the aether, so that the location of stored energy in space was like as it would be in a compressed spring. With the abandonment of the aether-theories, following the rise of relativity theory, this imaginary model ceased to have validity.

Whenever the concept of space is unable to logically explain any physical phenomena or the nature of transmission of certain actions and effects over a distance is not understood, even today, the aether (in the forms of various fields or mysterious force-carrying particles) is resorted to as a conceptual solution of the transmitting medium. This is because an all-encompassing universal medium is essential to destroy the myth of 'action at a distance through empty space', which is the worst illogical assumption of modern science. Currently different types of substitutes are used instead of space. However, any description of how these 'aether-substitutes' function remains vague, but its existence in the forms of various fields or particles is required by common sense and thus not questioned. Different types of fields, concentrated forms of energy, imaginary entities with negative existence, force-carrying particles, etc. are used in various theories. Each of these entities is different from each other and suits only a particular theory. Each one proposing different types of fields or structure with vague properties of aether; they have no common properties. They seem to exist without existence. They are mainly used for conceptual explanations and mathematical treatments of theories concerned. Such tendencies have taken physics far from conceptual understanding and caused its heavy dependence on mathematical analysis. Mathematics may be a very good tool to understand physics, but it should not dictate the theories.

For convenience of having references within the space for various purposes, space is partitioned by different methods. Most convenient method is to partition the space about a point (of origin) by three mutually perpendicular planes passing through the point. This gives us three-dimensional spatial system. Location of a body or an event can be defined by distances from each of the coordinate planes. Additional spatial dimension can be envisaged only when we are able to add another plane passing through the point of origin and the added plane is perpendicular to all other three planes passing through the point of origin. This makes an additional spatial dimension an impossible proposition, at least in contemporary geometry.

Space is also viewed only as a conception. Since the space provides an extent for real 3D material bodies to exist, the concept of '3D material object' is necessary to define space. The concept of '3D

material object' is linked to our sensory experiences, which continue through certain time. Existence of objects is thus of a conceptual nature, linked to sensory experiences. Existence or reality of 3D material bodies are defined simply as concepts of mind, which depends wholly on their being connected with sensory experiences. Argument supporting these types of theories is that a rational being's thoughts and concepts are created by experiences of his senses with 3D material objects. These experiences are meaningful only with reference to his senses. His thoughts are products of his mind's activity. As long as his mind can act in certain way, existence or reality of objects is immaterial to understand his surroundings. Therefore, no wise logical consequences of the sensory experiences are required to understand the universe or actions in it. Although this argument overlooks that the presence of real 3D objects is necessary to produce sensory experiences, without which mind's activity cannot take place, it is very useful to produce exotic and mysterious physical theories. In these types of theories, the space is often linked with another functional entity 'time', to form yet another functional entity called the 'space-time continuum'.

Universal medium as space:

A 'universal medium' that has all desirable properties of aether but has no disadvantages of the same may be proposed to replace (imaginary) functional entities like; space, fields, force-carrying particles, concentrated forms of energy, imaginary entities with negative existence, vibrating strings, etc., currently used to facilitate conceptual explanations on various physical phenomena. Then the terms 'universal medium' and 'space' can be used synonymously. The term 'space' (and other functional entities used in place of space) will then mean the 'universal medium' and vice versa.

An all-encompassing medium of matter may be envisaged to fill the entire space, outside three-dimensional matter particles, including inter-particle space in a macro body. To fill entire space is to have positive existence in space in all spatial dimensions, without voids in it. To have positive existence, the universal medium has to be a real object. Reality of an object is provided by its substance. In nature, matter alone can provide substance. Hence this universal medium has to have matter content. It can be made up of matter or matter in the form of small matter particles. To be made up of small matter particles is to have definite structure. Contents and structure endows an object with its properties. Hence the universal medium has to have definite structure and properties, derived from its constituent matter particles.

A three-dimensional matter particle contains matter without voids in it. Whole space, occupied by a 3D matter particle, is occupied by matter. Universal medium fills the entire space outside 3D matter particles. There are no voids in it. Hence, entire space outside 3D matter particles is also filled with matter. In order to satisfy this requirement, matter-density of a 3D matter particle and matter-density of universal medium, outside 3D matter particle should be the same. Yet, while 3D matter particles and bodies formed by them are tangible and can be sensed, universal medium and its components should remain intangible and hidden for 3D rational beings. Entire universal medium along with 3D matter particles in it, together, 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 universal medium. A matter-body of zero volume and infinite mass (singularity) is impossible to achieve.

A universal medium should be made up of real matter particles and under a definite mechanism of formation. All its actions, interactions and properties will have to be derived from the properties of constituent matter particles. Since matter alone can form a universal medium and diverse 3D matter bodies, all properties of both should be derived from the most basic matter particles in nature. No assumed particles, imaginary properties or mysterious interactions should be necessary to understand any physical phenomenon. Actions of basic matter particles in the universal medium should be able to account for all physical phenomena in nature; from creation and sustenance of universal medium to interactions between 3D objects; from creation and sustenance of fundamental particles to cosmological events; gravity to nuclear interactions; etc.

A universal medium should be a self-sustaining material body. By its inherent properties, the universal medium should strive towards homogeneity, isotropy and serenity; all by itself. All 'natural forces', apparent interactions between 3D matter bodies and diverse properties of 3D matter bodies in various forms should be extensions of these inherent properties. These properties should be derived from the properties of universal medium's constituent matter particles.

All 3D matter particles (and superior bodies made up of 3D matter particles) should exist within the universal medium. Universal medium should serve as interlink between every matter particle in the

universe. Since there are no direct contacts between 3D matter bodies and all 3D bodies are in contact with universal medium, the universal medium should serve as an intermediary for all apparent interactions between 3D matter bodies. Matter is inert. It cannot cause its own changes or displacements. All actions on matter bodies or those actions which appear as actions by matter bodies, in nature, should be performed by universal medium outside 3D matter particles. Universal medium should contain all 3D matter bodies and hence a common link between them. Each 3D matter body should be acted upon by the universal medium separately. Simultaneous actions by universal medium on different 3D matter bodies will appear as an interaction between them. Having a universal medium that is in contact with every 3D matter particle in the universe does away with the illogical assumption of 'actions at a distance through empty space'.

Since the universal medium pre-exists all 3D bodies and no 3D bodies exists outside universal medium, it will fulfill the role of a container that is logically prior to its contents. Since 3D matter bodies do not exist outside universal medium, the universal medium has to create 3D matter particles out of itself, sustain them in their free states or in combinations in the form of self-sustaining superior 3D matter particles and macro bodies. To maintain its own stability, it will be necessary for the universal medium to create/destroy 3D matter bodies cyclically and in different localities in the universe. This should be done by gradually destroying 3D macro bodies in certain regions to revert their matter contents back into the universal medium, while creating 3D macro bodies from matter contents from it, in other regions. This will not only maintain the integrity and stability of universal medium, it will also regulate entropy of the universe within limits. A stable universal medium should be able to sustain a steady-state of universe, perpetually.

Rational beings are three-dimensional macro bodies. There are able to sense only three-dimensional objects. Since the universal medium or its components remain intangible and hidden to 3D rational beings, they should have their status in one-dimensional or two-dimensional spatial systems. Three-dimensional rational beings will be unable to sense them directly. Although basic matter particles have real existence in space, magnitudes of their spatial dimensions will be too small to be tangible or sensed by three-dimensional spatial standards. Thus, universal medium or its constituents in 1D or 2D states will remain hidden for all practical purposes. However, it could manifest its presence by actions on 3D matter bodies.

All actions require impetus. Impetus is the 'ability to do work'. A matter body contains nothing but matter, which is incapable to do work. Hence, the ability to do work should be stored outside matter bodies but in association with them. Universal medium, surrounding 3D matter particles or in and about a 3D macro matter body is an ideal place to store the 'ability to do work'. In order to act on matter bodies, the universal medium should have ability to act.

All actions are recognised by motion (displacement) of matter bodies. Macro bodies move by sequential displacements of their matter particles, starting from the point of application of external effort. Matter particles, nearest to the 'force-applying mechanism', move first. This, in turn, compresses universal medium between the displaced matter particle and the matter particle in front. Inherent property of stability causes the compressed part of universal medium to return to its original form by expanding. This expansion can be achieved only by pushing the matter particles away from each other. Since the matter particles at the point of application of external effort are displaced forward and held in place, matter particles in front have no options but to move forward. Similar actions, between matter particles of a macro body cause its displacement during an action by external effort. 'Energy-transfer' in/by macro bodies, essentially requires a universal medium between their constituent matter particles.

'Energy' can also be transferred through space in the form of invisible disturbances/particles, like: 'electromagnetic waves', 'field-disturbances', etc. Since no displacements of matter particles are involved in this process, the universal medium, itself, has to act as an agent of 'energy-transfer' by its own compression and expansion.

A universal medium should be a stable but deformable real entity. Deformations are displacements of its constituents and hence tangible. Displacements in universal medium are 'work' and it is tangible. A tangible entity is real. Hence, work is a real entity in physical form. 'Ability to do work' is a qualification of the universal medium. It could be the stress produced in the universal medium due a strain/distortion in it. Ability to act or to do work is called 'energy'. Hence, energy is a quality of universal medium. Universal medium acts as storage for 'energy'. Unlike stress, displacement is tangible and hence real. Stress accompanies strain in a stable system. Hence, the strain in the universal medium about a matter body is the

work-done and associated stress is its energy. Energy has no independent existence and it is a functional entity. It appears as a shadow of work-done.

Universal medium in 'Hypothesis on MATTER':

In his book 'Hypothesis on MATTER', author of this essay proposes a new universal medium. It is made up of (postulated) 'quanta of matter'. Quanta of matter are the only one type of entities postulated in this concept. All other bodies, functions and characteristic properties of diverse matter bodies are developed from quanta of matter. In order to distinguish the proposed universal medium from other forms of mediums in the past, it is called as '2D energy fields'. 2D energy fields are formed from quanta of matter by definite mechanism. Since 2D energy fields fill the space, their constituent quanta of matter fill the entire space, outside 3D matter particles. 2D energy fields have all the required properties given in the above paragraph describing an ideal medium. It is a real 'material object' and an ideal all-pervading universal medium that can be substituted for space. 2D energy fields extend to infinity in all directions.

'2D energy fields' is an arrangement of infinite number of latticework structures formed by quanta of matter, separately in each plane. A 2D energy field exists and extends infinitely in all directions in its own spatial plane. All possible spatial planes in the universe contain one 2D energy field, each. A 2D energy field has definite structure and it derives all its characteristic properties from constituent quanta of matter. Being the sole occupant of space, except the 3D matter, the 2D energy fields have to create 3D matter particles from and by itself. It also has to maintain the stability and integrity of all such 3D matter particles and superior bodies created. Apparent interactions, by the help of 2D energy fields, combine and group 3D matter particles to form diverse fundamental particles and larger macro bodies.

Quantum of matter:

'Quantum of matter' is postulated as the foundation of the alternative concept given in 'Hypothesis on MATTER' [1]. No other imaginary particles or assumed properties are envisaged in this concept. All superior matter bodies and their diverse properties are natural extensions of characteristic properties of quanta of matter. Development and apparent actions of matter bodies strictly follow 'cause and effect' relation.

A quantum of matter is postulated as a real matter particle that has positive existence in space. It is a very small bit of matter. It has its existence in all spatial dimensions, however small such measurements may be. Each quantum of matter is an independent matter-body and it keeps its individuality under all conditions. Quantum of matter cannot be divided, destroyed or created. Different quanta of matter may contain different quantities of matter. Majority of quanta of matter in nature are of somewhat equal matter contents. 3D matter particles are made solely of quanta of matter. Entire space (outside 3D matter particles) is filled with quanta of matter in definite structural formations. There are no voids. Any gap in space is immediately filled up 2D energy fields.

Matter content, at nearest points (within a quantum of matter or between quanta of matter in direct contact in the same spatial dimensions), has an adhesive property (a tendency to merge) and matter content of a quantum of matter tends to maintain its integrity under all conditions. Due to the adhesive property of its matter content, a free quantum of matter tends to grow in one spatial dimension, while reducing its measurements in all other spatial dimensions. Even though, dimensions of a quantum of matter in spatial dimensions, other than its single spatial dimension, are negligibly small, a quantum of matter has positive existence in all three spatial dimensions. Thus, a free quantum of matter is a one-dimensional matter-body with positive existence in all spatial dimensions. It has a natural tendency, necessitated by its matter content, to grow in its own single spatial dimension. Reducing the length of a free quantum of matter, by external efforts, compels it to grow into second spatial dimension. Similarly, reducing the area of a 2D quantum of matter, in its spatial plane, by external effort compels it to grow into the third spatial dimension. If left free, in free space, a quantum of matter will grow in length indefinitely.

During lengthening process of a quantum of matter, its ends may come in contact with other quanta of matter, which happen to be in its spatial dimension. Under such condition, the lengthening process of the quantum of matter is restricted. Matter contents of the quanta of matter, in contact in the same spatial dimension, interact to move both quanta of matter towards each other's ends, together to form a junction and attempt to turn the quanta of matter to bring their bodies in a straight line. In this manner, free quanta of matter in space tend to form one-dimensional chains. Due to frequent ruptures of these quanta-chains

and availability of free quanta of matter to migrate into ruptured 1D quanta-chain, there are far too many quanta of matter in any quanta-chain. Excess number of quanta of matter in a quanta-chain compels all constituent quanta of matter in the quanta-chain to be held at reduced lengths in their one-dimensional status. Tendency of quanta of matter in the chain, to grow in length, keeps all constituent quanta of matter in quanta-chains under compressive pressure from their ends. Normally, quanta of matter in a quanta-chain are maintained at the brink of their growth into second spatial dimension. If a lengthening-quantum of matter encounters quanta of matter in other spatial dimensions, it will not be restricted in its growth. Quanta of matter in different spatial dimensions but passing through the same point, in space, coexist at the point. A quantum of matter can express its individuality only in spatial dimension(s) of its existence.

Although quanta of matter in their 1D status are real matter bodies with positive existence in all three spatial dimensions, 3D rational beings are unable to appreciate their real existence in 3D spatial system. Their measurements in all spatial dimensions are too small to be tangible in 3D space system. Because of this difficulty, we may consider quanta of matter in their 1D and 2D states as functional entities.

2D energy field:

A junction may be formed by any number of quanta of matter in the same plane. Quanta of matter, forming a junction, settle (radially) around the junction point in the same plane, with equal angular difference between neighbouring quanta of matter. However, junction points with four quanta of matter (neighbouring quanta perpendicular to each other) provide most stable configuration. For this, the quanta-chains in a plane settle perpendicular to each other and crossing at the junction points to form a latticework structure. Each quantum of matter occupies one side of a square formed by the quanta of matter in the latticework structure. Only quanta of matter of (somewhat) equal matter contents make stable latticework by quanta-chains. This latticework structure, formed by the quanta of matter in a plane, is a 2D energy field. A 2D energy field extends infinitely in its plane, in all directions.

Although a 2D energy field is made up of inflexible quanta of matter, its latticework-structure makes it very flexible in its plane. Distortions of limited magnitude are tolerated within a 2D energy field. During distortions: (a). Quanta of matter meeting at a junction point are angularly deflected from their stable alignment with respect to each other and/or (b). Quanta of matter in the quanta-chains vary their length, depending on the variation of compression from their ends.

Angular displacements of quanta of matter at a junction point invoke angular reaction from the latticework on them to return to their stable positions. Similarly, a change in the length of a quantum of matter invokes reaction from the latticework to restore its stable configuration. Any distortion in the 2D energy field is always opposed by a reaction from the latticework. This reaction tends to restore the stability and serenity of a 2D energy field. Thus, it becomes an inherent property of the 2D energy field to strive towards its stable isotropic state. In its stable state, a 2D energy field is isotropic, homogeneous and serene. A 2D energy field, considered as a whole, is steady in space. Small local distortions in it may be transferred within its plane. Hence, the 2D energy fields can provide an absolute reference in space.

Due to latticework structure of a 2D energy field and its inherent property of stabilization (except for gravitational actions in certain cases), distortions in a 2D energy field cannot be contained in any locality. A distortion in a 2D energy field is bound to spread-out in its latticework. If there is an external cause, the distortions tend to be transferred in the direction away from the cause, without displacing the 2D energy field. Sequential spread of distortion, from one latticework square to the next, introduces a time delay in the development and transfer of distortions. As soon as the cause is removed, latticework structure of the distorted 2D energy field tends to regain its stability. However, the distortions, contained in the latticework, will continue to move in their original direction, unless they are removed by an external agency, by introducing equal but opposite distortions in the latticework. These properties of time delay during the development and transfer of distortions and constant speed of their transfer through the 2D energy field give rise to the property of inertia, which is presently attributed to matter bodies. A distorted region of 2D energy field is a ‘distortion field’. Due to the latticework structure of a 2D energy field, distortions in it can exist only in a closed-loop-arrangement.

Displacements of quanta of matter (including the changes in their lengths) are tangible in 2D space system. They are real and constitute ‘work-done’. Stress, produced by distortions in the latticework structure, is the ‘energy’ associated with the work-done. Rate of magnitude of distortions (work), being

introduced into a 2D energy field latticework, is the 'force' or 'power'. Ultimately, displacements of disturbances (matter bodies) in 2D energy fields are produced by transfer of latticework distortions from higher distortion-density region to lower distortion-density region. This is the action of an effort. Whichever is the manifestation of effort (as classified into various 'natural forces' like: gravitational, electromagnetic, nuclear, inertial, etc.), they all act in similar manner. Thus, fundamentally, there is only one type of effort in nature. 'Force' is generally associated with motion of a body and it simply means rate of work, irrespective of the nature of work or its source.

Every possible plane in space contains a 2D energy field, each. 2D energy fields in different planes, passing through a point, co-exist at that point. 2D energy fields fill the entire space outside 3D matter particles. 2D energy fields in all possible planes in three-dimensional space, together, replace the functional entity of space with a real entity. Since a volumetric space is filled by the 2D energy fields and 3D matter particles in it, the entire volume is occupied by quanta of matter, either in the form of 3D matter or as matter in lower spatial dimensions. Total matter content within this volume of space is comparable with matter content of a 3D matter particle occupying similar volume of space. Since the 2D energy fields cannot act among themselves, matter content enclosed within this volume of space, in the form of 2D energy fields, cannot express itself to 3D rational beings. However, a 3D matter particle of the same volume can be acted upon by 2D energy fields. It is able to express itself to the observer by its displacement in 2D energy fields. Rational beings recognize (3D) matter bodies by its expression of actions to an observer. Therefore, even though the matter content of a volumetric space in the 2D energy fields remains hidden from observers, a 3D matter particle of similar volume within the 2D energy fields is observable. This is why the 3D matter is considered as real matter and 2D and 1D matter are considered as functional matter in this concept. This hidden part of matter in the universe (occupying nearly whole volume of space) may be called the 'dark matter'.

Although 3D matter particles are created out of and by the 2D energy fields, their volumetric shape and space enclosed by their bodies are distinct from surrounding 2D energy fields. 2D energy fields maintain constant contact at a 3D body's surfaces and maintain the 3D body in its three-dimensional status. 2D energy fields, inherently being under compression, exert external pressure on all 3D matter particles (disturbances) in it. This phenomenon is gravitation. Gravitational effort is enormously stronger than all other manifestations of 'natural force'. 'Natural forces', classified into various types (electromagnetic, nuclear, inertial, etc.), are derived from gravitational actions. Hence, there is only one type of effort in nature and all 'natural forces' (currently classified into various types) are different manifestations of the same natural gravitational effort.

Actions are recognized by inertial motions of corresponding matter bodies. Magnitudes of gravitational actions are proportional to the extent of 2D energy fields applying the effort. Since the 2D energy fields extend infinitely, their extents on the outer sides of two 3D matter bodies are always greater than their extent in between the bodies. Hence, gravitational actions on these bodies are greater on their outer sides. Resultant of gravitational actions on these bodies appears to push them towards each other. This phenomenon appears as the 'gravitational attraction' between matter bodies. Currently, only this dynamic-part of gravitational action is considered as its sole nature. Static nature of gravitation is more important and basic. Since the gravitational actions are between 3D matter particles and 2D energy fields, which are in direct contact, they are instantaneous on changes in parameters and continuous.

2D energy fields are latticework structures formed by apparently rigid quanta of matter. Although they are made up of rigid matter particles, 2D energy fields structurally behaves like an ideal fluid. A 2D energy field is easily deformed due to very small bonding strength of joints between constituent quanta of matter. Deforming effort always acts against stabilising effort at junction points in the latticework structure. Due to its ability to stabilise itself, any distortion in a 2D energy field cannot remain static or localised; it spreads the direction of effort causing the distortion. 3D matter particles are held suspended by the 2D energy fields in it. Transfer of distortions in 2D energy fields carry suspended 3D matter particles in the region along with the moving distortions. Although a moving 3D matter particle has no relative motion with respect to 2D energy fields in its immediate neighbourhood, it is displaced with respect to the vast expanse of 2D energy fields. Although distortions in 2D energy fields appears to move during their transfer, 2D energy fields as a whole, remains static, homogeneous, isotropic and serene. Static 2D energy fields can provide an absolute reference for all actions in nature.

All free distortions or distortions associated with a basic 3D matter particle, travel at the speed of light. Distortions, associated with macro bodies/particles may move at any linear speed, lower than the highest limit. As 2D energy field-distortions move, they carry all 3D matter particles present in the region, along with them. In case of macro bodies/particles, this phenomenon causes inertial motion. Since, it is the displacement of the distortions, which moves the 3D matter bodies; there is no relative motion between matter bodies and surrounding 2D energy fields. It is like, when an object is blown away by wind, there is no relative motion between the object and air in its immediate neighbourhood. But the object has a clear displacement with respect to the large body of air in the region. Therefore, there is no friction between 2D energy fields and a macro body moving in it. There is no 'aether drag' on a macro body, moving through 2D energy fields.

2D energy fields extend in all directions to infinity. It is the ability of rational beings to gather information from a distance that determines limit of universe for them. Although 2D energy fields extents infinitely in all directions, it is the limitation on the ability of rational beings that limits the size of universe for them. This limit is identical in all directions, irrespective of location of observer in space.

Gravitational actions by 2D energy fields are the basis of creation of 3D matter, development of various primary and fundamental matter particles, formation of atoms/molecules and macro bodies. 2D energy fields create, sustain and gradually destroy all 3D matter bodies in nature. Nature of distortions in the 2D energy fields, in and about matter bodies of various sizes and structures, defines their characteristic properties and nature of apparent interactions between them.

Gravitational attraction between (macro) matter bodies compel them to move in space. Hence, all matter bodies in nature, except stable galaxies, are under motion. Galaxies have special mechanism that keeps them in relatively static location within 2D energy fields. As a whole, the universe is steady and perpetual. However, 3D matter and macro bodies in different parts of universe are cyclically destroyed and rebuilt. During destruction, 3D matter is reverted to its basic form of quanta of matter to become part of 2D energy fields. Simultaneously, 3D matter particles are formed elsewhere in the 2D energy fields through various stages of creation and conversion to produce 3D macro bodies.

Properties of 2D energy fields:

A 2D energy field is a two-dimensional entity. It has only length and breadth as its fundamental spatial dimensions. A real entity in space essentially exists in all spatial dimensions of the space. Hence, however small its dimensional measurement may be, a 2D energy field has its existence in the third spatial dimension also.

A volumetric space is made up of great many parallel planes, in contact. If a plane is considered to have no thickness, any number of parallel planes cannot constitute a volumetric space. Since 2D energy fields occupy volumetric space, each 2D energy field has certain thickness and there is a definite separation between two 2D energy fields in adjacent parallel planes. Parameters of a 2D energy field or other 2D bodies can be accurately determined only after evolving a mathematical system that can measure the thickness of a plane or breadth and thickness of a straight line.

2D energy fields (universal medium), as envisaged in 'Hypothesis on MATTER' to substitute for space, have the following inherent properties:

1. Inherent properties of 2D energy fields are derived from inherent properties of their constituent quanta of matter and mechanical structure of their latticework formations.
2. 2D energy fields are two-dimensional entities made up of single-dimensional quanta of matter. Each 2D energy field exists and acts in its own plane. Only one 2D energy field exists in any one plane and all planes in all directions in 3D space contain one 2D energy field each.
3. 2D energy fields in different planes, passing through a point in space, co-exist at the point. However, each 2D energy field can act only in its own plane.
4. Quanta of matter in a 2D energy field are held under compression from their ends, in quanta-chains situated in perpendicular directions, crossing at junction points between quanta of matter.
5. In stable state of a 2D energy field, constituent quanta of matter form sides of perfect squares in its latticework structure. A change from the stable state produces restoring reactions in the latticework structure.

6. 2D energy fields are self-sustaining entities. They strive to sustain their integrity, stability, homogeneity, isotropy and serenity. Each 2D energy field has an adhesive force within itself and tends to maintain its continuity in the plane of its existence.
7. Tendency of 2D energy fields to close-in any gap in them, produces phenomenon of gravitation.
8. 2D energy fields fill the entire space outside 3D matter particles. Each 2D energy field extends indefinitely in all directions in its plane. Since there are no voids (or limits to the extents of 2D energy fields), no matter particles can exist outside 2D energy fields.
9. All higher-dimensional spatial systems exist within the 2D energy fields and all higher-dimensional matter particles are disturbances with respect to 2D energy fields.
10. 2D energy fields tend to reduce disturbances in them to minimum; either by reducing their sizes by shaping them circular and compressing to smaller size and/or by ejecting the disturbances from the site of their creation.
11. All 3D matter particles are created from, sustained by and reverted back into 2D energy fields.
12. 2D energy fields provide an all encompassing universal medium for all 3D matter bodies and apparent interactions between them.
13. On the whole, the 2D energy fields are perpetual and steady in space. No new 2D energy field is ever produced. They provide an absolute reference.
14. Region of 2D energy fields, about a 3D matter-body, store work in the form of distortions (and energy in the form of stress due to the distortions) to sustain integrity and stability of the 3D matter-body and its current state (of motion).
15. Distortions (work-done and corresponding force) in two 2D energy fields cannot interact. Transfer of distortions or interactions between distortion fields are limited to the plane of each 2D energy field. Simultaneous actions in many planes appear to be an action in 3D spatial system.
16. 3D matter particles are displaced in space by the transfer of distortions in steady 2D energy fields. Absolute motions of matter bodies are with respect to the steady 2D energy fields.
17. 3D matter bodies are moved by 2D energy fields rather than the bodies move through 2D energy fields.
18. Latticework structure of a 2D energy field causes sequential development of distortions in neighbouring latticework squares. Distortions, once developed, remain permanently within the 2D energy field, unless removed by external action. These phenomena give rise to the property of inertia.
19. Interactions between two points in a 2D energy field are confined to the plane containing both the points. In order to avoid theoretical possibility of more than one 2D energy field passing through two points, here, a point should be understood to be having the smallest area and be a part of one 2D energy field plane. So that, there can be only one 2D energy field passing through any two coplanar points.

Three-dimensional matter:

Constituent quanta of matter in a 2D energy field are held under compression from (both) their ends. Should there be a local rupture; a gap is created in the 2D energy fields. Quanta of matter, which occupied the region of the gap, as part of the latticework, are released from the latticework structure to float freely within the gap. As soon as these quanta of matter become free, they start to grow in their single spatial dimension to increase their lengths, while attempting to regain their positions in the latticework structure. In the mean time, due to their inherent compression, quanta-chains will grow into the gap and reduce area of the gap. As a result, many of the free quanta of matter in the gap will not be able to migrate back into the latticework structure of 2D energy fields. Quanta of matter, which are unable to gain their position in the latticework structure, are gathered together, within the gap, by the encroaching quanta-chains. These free quanta of matter are gathered and compressed by each of the 2D energy fields, in its own plane, until the combined body of free quanta of matter become a circular '2D disturbance' within each of the 2D energy fields. This phenomenon gives rise to the property of 2D energy fields to reduce any disturbance in them to minimum magnitude. Magnitude of a disturbance in any plane is the length of its perimeter in that plane and in contact with the 2D energy field.

Tendency of a 2D energy field, to grow into a gap in it, is gravitational action. Gravitational pressure (force) is enormously strong, that it can compress 1D quanta of matter into their higher spatial dimensions. If the matter content of a 2D disturbance in a 2D energy field is more than certain limit, compression on the disturbance, by gravitational pressure, compel constituent quanta of matter in the 2D disturbance to grow into their third spatial dimension. A disturbance, growing into the third spatial dimension, creates real three-dimensional matter. In our sense, this is the creation of real matter from the postulated 1D matter particles (functional entities with respect to 3D beings). A reverse process describes reversion of real 3D matter into its functional state.

Gravitational effort is exerted by a 2D energy field in the direction away from the quanta-chains, which are exerting the effort. It is of push nature. Due to latticework structure of 2D energy fields, gravitational effort can act only on curved perimeter (surface) of a disturbance. All 3D matter particles are disturbances with respect to 2D energy fields. If the distortion-densities in 2D energy fields on opposite sides of a 3D matter particle are different, distortions tend to redistribute by moving in the direction of lower distortion-density region. While doing so, distortions in the 2D energy fields carry a disturbance within the gap, along with them. This causes displacement of a disturbance in space.

If there are more than one disturbance in a 2D energy field, extent of 2D energy field on the outer sides of the disturbances are greater than the extent of 2D energy field in between them. Gravitational effort is proportional to the extent of 2D energy field that is applying the effort. Hence, these disturbances experience greater gravitational efforts on their outer sides, compared to the gravitational efforts, experienced on their inner side. This causes a relative difference between the gravitational efforts applied on either side of the disturbances. Resultant of the gravitational efforts tends to move the disturbances towards each other. This is the apparent attraction due to gravitation or gravitational attraction. Bringing two smaller disturbances, by gravitational attraction, to combine with each other and form a larger disturbance is another manifestation of 2D energy field's property to reduce disturbances in it to minimum. All higher-dimensional matter-bodies are disturbances with respect to 2D energy fields.

2D energy fields act on each of the disturbances in it, separately. Simultaneous actions on two or more disturbances (bodies) considered together appears to be interactions between these disturbances. Since the gravitational attraction between two disturbances is the resultant of differences in the gravitational actions on them, the action appears to be very feeble compared to other forms of 'natural forces'.

Action of gravitational effort/pressure on each 3D matter-body is independent of all other 3D matter-bodies. Development of 2D energy field-distortions, about a 3D matter-body, which produce the gravitational actions on it, is an inertial action (an action that produces the property of inertia). This takes place during the development of basic 3D matter particles. Thereafter, the apparent interactions between 3D matter-bodies, due to gravitation, are instantaneous. Hence, the action of gravitational attraction takes place instantly on change of parameters or constitution of 3D matter-bodies. Changes in the parameters or constitution of a 3D matter body are carried out by developing appropriate 2D energy field-distortions about the body. Gravitational effort on the body changes simultaneously during this development. This causes instantaneous changes in gravitational attraction between two 3D matter bodies, on changes of their parameters. No transfer of imaginary particles/energy from one body to another is required to produce changes in gravitational attraction between two matter bodies. However, the inertial motions of 3D matter bodies, under gravitational attraction, are again subject to inertial delay.

3D matter particle:

Larger 2D disturbances are further compressed by the 2D energy fields into their 3D state. Gravitational actions by 2D energy fields on a group of randomly oriented free quanta of matter (within a temporary gap in the 2D energy fields) compress the collection to create matter core of a basic 3D matter particle. During the creation of a 3D matter particle, unevenness of gravitational action on its surface causes ejection of the 3D matter particle (in full or in part) from the 2D energy field, where it was originally located. 2D energy fields are everywhere in space. 3D matter particle can never escape from being in many 2D energy fields, simultaneously. Therefore, ejection of 3D matter particle from 2D energy fields of their existence is a continuous process. This creates the inherent property of a 3D matter particle to move in a linear path in 2D energy fields.

Asymmetry of ejection effort on a 3D matter particle about its centre of mass initiates its spin motion about one of its diameter. Eventually, gravitational actions on the 3D matter particle move it at a constant

(highest possible) linear speed and spin it at an angular speed proportional to its matter content. 2D energy fields exert gravitation by creating distortions in the region surrounding the 3D matter particle. All work (energy) required for the creation and motion of a 3D matter particle is stored in the 2D energy field-distortions associated with the 3D matter particle. As the distortions are transferred through 2D energy fields at the highest possible linear speed, the 3D matter particle is also carried with the distortions. Surrounding distortions in the 2D energy fields, about this 3D matter particle, mould its core body into segmented spherical (disc) shape and moves it at the highest possible linear speed. Its radial size is maintained at a critical value, which is common to all moving 3D matter particles.

This disc-shaped 3D matter particle (moving at a constant linear speed and spinning at an angular speed proportional to its matter content) and its associated 2D energy field-distortions, together form a 'photon'. A photon is a corpuscle of radiation (infra red radiation, light, x-rays, etc.). A photon has a matter-body, as its core and surrounding 2D energy field-distortions ('inertial pocket'), facilitating its motions. Inertial pocket, about a photon's matter-body in any plane, has many similarities with electromagnetic waves. The core body and the surrounding inertial pocket give a photon, its dual nature. The core body provides the corpuscular nature and the inertial pocket provides the electromagnetic nature.

2D energy fields mould a photon to its stable shape, moves it at the highest linear speed through the 2D energy fields and spins it about one of its diameter at an angular speed proportional to its matter content. It is thus, the light attains its constant linear speed. This speed is the limit of linear motion (of real bodies) in nature because that is the highest possible linear speed at which the 2D energy fields can transfer distortions in it. Speed of light or electromagnetic waves is with respect to surrounding 2D energy fields and it depends on the nature of the 2D energy fields in the region, where the photon is moving. Characteristic movements of photons are essential for their sustenance. An attempt to increase linear speed of a photon, results in an increment in its matter content (by absorbing quanta of matter from 2D energy fields) with corresponding increase in its frequency rather than a change in its linear speed. Similarly, an attempt to reduce linear speed of a photon, results in a reduction in its matter content (by absolving quanta of matter from its core body into the 2D energy fields) with corresponding reduction in its frequency rather than a change in its linear speed.

All self-sustaining primary and fundamental particles are made up of groups of photons, in various combinations, which then form atoms and macro bodies of diverse properties. Gravitational actions of 2D energy fields accomplish these developments under suitable conditions. Constituent photons of primary / fundamental particles move at their critical linear speed in curved paths within respective bodies. Curvature of a photon's path makes its inertial pocket unstable. Instability of inertial pockets of constituent photons in primary and fundamental particles alter nature of distortions in surrounding 2D energy fields. Depending on the nature of these distortions, they form various 'distortion fields', which may interact like: gravitational fields, matter fields, electric fields, electrostatic fields, magnetic fields, nuclear fields, inertial fields, etc.

Gravitational actions are applicable only on curved perimeter-surfaces of photons' core bodies. Photons are disc-shaped matter particles of critical radial size, which spin about one of their diameters. Gravitational attraction between two macro bodies takes place only when disc-planes of a number of photons in both macro bodies are in common planes. Constituent photons of a macro body spin about their diameters and move at constant linear speed in circular path within (primary 3D matter particles of) the macro body. Hence, duration for disc-plane of any one photon in a macro body to be in a common plane with disc-plane of a photon in another body is very small and very rare. Hence, magnitude of gravitational attraction between two macro bodies is extremely small compared to the magnitude of gravitational actions. This has prompted us to label gravitation as a 'very weak force'.

A photon moves through 2D energy fields. Moving 2D energy field-distortions (inertial pocket around the matter core of the photon) carry matter body of the moving photon. There is a relative motion between the photon and the 2D energy fields. Relative motion causes resistance to the motion of the photon's matter core body. However, at any instant, sufficient ejection-effort is produced by photon's inertial pocket to overcome this resistance. Since, both the resistance and the ejection are produced by the 2D energy fields; this effectively reduces any drag on the photon to nil value. Thus, it becomes the inherent property of the 2D energy fields to move all 3D matter particles (photons) in it, at the highest possible linear speed. Ability of the ejection, to overcome resistance, determines this highest possible linear speed, which we

observe as the speed of light. Highest possible linear speed, for any region of 2D energy fields (space) is a constant.

Linear and angular speeds of a photon are with respect to 2D energy fields. Its linear speed is a critical constant; because that is the highest possible linear speed it can move under the transfer of distortions in a 2D energy field, without rupturing 2D energy field's latticework structure. Hence, linear speed of light in any region space, in any direction is a critical constant. A photon traverses the same number of 2D energy fields' latticework squares in the same interval of time. (Note that the scale of time and distance are defined in terms of observed speed of light).

Usually, the observer is also located in the region of 2D energy fields, where the speed of light is considered. Under such conditions linear speed of light with respect to the observer is identical in all direction, irrespective of motions of the observer. This is because the linear speed of the observer with respect to the surrounding 2D energy fields is negligible, when compared to the linear speed of light with respect to the surrounding 2D energy fields. If the observer is small enough to move with considerable speed with respect to the surrounding 2D energy fields, linear speed of light in the region will obey all physical rules of relative motion, as any other body's motion. Discrepancies appear only when the speed of light in different regions of space (with different 2D energy fields-distortion status) are compared. This is how we came to regard; (a) the linear speed of light as variable, when the light is transmitted inside a medium within the region of the observer and (b) the time as variable, when the light is transmitted in a medium, outside the region of the observer.

Shape of the matter core of a stable photon is segmented spherical with convex curvature at the rear of each segment. Curvatures on the surface of photon's core-body vary continuously to provide the required ejection and spinning efforts. A photon is the basic 3D matter particle and there are no other basic 3D matter particles. All other superior matter bodies are made up of photons, in various combinations.

Macro bodies:

Two (complimentary) high-matter-content photons, under suitable conditions, combine like a binary unit of spinning bodies (spinning about a common axis) moving in circular paths in a plane, about a common centre. This unit is a primary matter particle, called 'biton'. Bitons, in turn combine to form fundamental particles, atoms, molecules, etc., to form macro bodies. Each particle of a macro body has its constituent photons and associated inertial pockets. Due to the curved paths of photons in bitons, their inertial pockets are permanently unstable. Unstable inertial pockets of constituent photons combine to form distortion field of a biton. Distortion fields of all particles in a macro body, together form its 'matter field'. Matter field of a macro body contains enough 2D energy field-distortions in it, to sustain the stability and integrity of its matter particles and the combined body in its current state. Due to the latticework structure of the 2D energy fields, matter field of a macro body extends outside its body-dimensions. Magnitude of this extension depends on the size of the macro body and distortion-density of its matter field. Distortion-density, in a matter field, gradually reduces from the macro body's perimeter until all distortions are lost and the latticework squares of matter field become part of undistorted latticework of 2D energy field in space.

Additional 2D energy field-distortions, introduced (transferred) into the matter field of a macro body (from an external source), induce macro body's whole body motion. Matter particles of the macro body are moved with respect to 2D energy fields. Although 2D energy fields are steady in space, it is the moving distortions in them, which are moving 3D matter particles of the macro body. Because of this arrangement, even though the matter particles are moving with respect to static 2D energy fields, no resistance is offered by the 2D energy fields to the motion of the body-particles or the macro body. A macro body, moving through the 2D energy fields, does not suffer drag from the medium.

Distortions in 2D energy fields move in straight lines, separately in each of the planes. Rotary motion of a macro body is produced by linear motions of body-parts in different directions at different linear speeds. Additional 2D energy field-distortions, producing linear and rotary motions of a macro body, have distinct existence in its matter field. They do not affect each other. If constituent matter particles of a linearly moving macro body are moved away (by another effort) from the linearly moving additional distortions in the macro body's matter field, linearly moving additional distortions will be lost from macro body's matter field into space and the macro body will stop responding to the lost additional distortions. State (of motion) of a macro body depends on the distortion-density of additional distortions (other than

the 2D energy field-distortions required to sustain the integrity and stability of the macro body and its constituent particles) and the distribution of these additional distortions in its matter field.

Introduction of additional distortions from external source into a matter field and their stabilizations within the matter field of the macro body, takes time. This time delay gives rise to the property of inertia, which is presently attributed to the body-mass. Inertia is a property of associated matter field of a macro body (2D energy fields). Matter content of a body is inert. It is the associated 2D energy fields that produce all apparent actions / interactions, presently attributed to matter bodies. Once, certain magnitude of additional distortions are introduced into matter field of a macro body, it remains permanently within that matter field and continues keep the macro body in its current state (of motion) indefinitely, until the additional distortions are lost or removed (neutralized by distortions in opposite direction) from its matter field by an external effort.

Since additional distortions (introduced by external source and moving the matter particles) in a matter field are associated with 3D matter particles, speed of their transfer is limited by the magnitude of associated additional distortions. Hence, a macro body may move at any speed, lower than the maximum permitted speed by 2D energy fields (less than the speed of light). As the speed of a macro body approaches the speed of light, constituent matter particles of the macro body breakdown to inferior matter particles until macro body's speed reaches the speed of light. At the speed of light, only photons from the macro body survive. Beyond this speed no matter particle can move. This limits the speed of 3D matter bodies in space to less than the speed of light. Gradually, even the photons revert back to quanta of matter and join 2D energy fields. Continuous recycling of matter between 3D macro bodies (where the entropy increases) and 2D energy fields (where high order is maintained) keeps the entropy of universe within limits. Total magnitude of matter, in the form of 3D macro bodies in the universe, vary cyclically.

Due to latticework structure of 2D energy fields, rate of additional distortions transferred (force or power) into matter field of a macro body depends on the magnitude of external effort and current linear speed of the macro body in the direction of external effort. External effort will become less efficient to transfer additional distortions in the direction of already moving-matter field. External effort on a macro body becomes less efficient as macro body's linear speed increases. In current terminology; efficiency of an 'external force' reduces as linear speed of a macro body (in the direction of 'external force') increases. This phenomenon causes inconsistency, when we use 'mass' to represent 'matter content' of an accelerating body. Mass, being a mathematical relation between external effort on a body and the body's acceleration in the direction of the effort, increases as efficiency of external effort reduces due to increase in body's linear speed. This phenomenon is currently (wrongly) attributed to conversion of 'energy' into 'mass' (relativistic mass).

Inertia is another property of 2D energy fields, produced by their latticework structure. Gravitational attraction is the product of difference in the extent of 2D energy fields on opposite sides of 3D matter particles of a body. Both these phenomena have nothing to do with 'mass' of a body, which is the mathematical relation between an 'external force' on a macro body and the body's 'acceleration' in the direction of 'external force'. Hence, differentiation into 'gravitational mass' and 'inertial mass' is arbitrary. More over, 'mass' does not always represent 'matter content' of a matter body.

Distortion fields:

Gravitational actions, essentially, requires a gap in a ruptured 2D energy field. Gravitational pressure is applied by the 2D energy field onto a disturbance (even if it is in the form of 3D matter-body) within the gap. Gravitation is applied onto the disturbance as long as the disturbance is in existence in a gap in 2D energy fields. Due to continuous application of gravitation, latticework squares around a disturbance / 3D matter body remain distorted as long as the disturbance is in existence. Directions of the distortions are inward from the (curved) perimeter of the disturbance, towards the centre of curvature (of body's perimeter). This region of 2D energy field-distortions around a 3D matter body may be called its gravitational field.

A 3D matter-body is moved by the transfer of distortions in 2D energy fields. Conversely, movement of a 3D matter-body through a 2D energy field can be considered to produce distortions in the 2D energy field. Two sets of distortions, acting in different directions on a 3D matter-body tend to move the body in a resultant direction. Movement of the 3D matter-body in resultant direction produces distortions in the 2D

energy fields in the direction of its current motion, while the original distortions (which caused particle's resultant motion) are lost to the particle due to its displacement from the direction of transfer of those distortions. State of motion of the matter-body in the new direction is maintained by additional distortions caused by the motion of the matter-body in the resultant direction. A matter-body, moved by more than one set of additional 2D energy field-distortions, produce independent set of additional distortions, corresponding to body's current motion, in the surrounding 2D energy fields.

Constituent (two) photons of a biton move in a common circular path. They are under constant action by distortions causing their linear and spin speeds at critical values and additional distortions produced due to gravitational attraction between them. Motions of these photons in resultant circular path create new sets of distortions in the 2D energy fields surrounding the combined matter particle. These distortions constitute distortion field of the biton, which is angular in direction, around the biton. Number of bitons combines to form superior matter particles. Distortion field of a superior particle is the resultant of distortion fields of all its constituent bitons.

Distortion field of a matter particle is a local region in the 2D energy field outside the border of the matter particle. Unlike gravitational field, it does not require a discontinuity in 2D energy fields. Due to latticework structure of a 2D energy field, distortions in it have to form closed loops. If the distortion starts at a point, it has to spread through the 2D energy field and return to the starting point, so that there is no discontinuity in its latticework structure. Development of a distortion field is an inertial action. Unlike the 2D energy field-distortions, which act on matter bodies due to gravitation, 2D energy field-distortions in a distortion field cannot act on 3D matter-bodies, because certain actions of the same matter-bodies are the cause of these distortions. 2D energy field-distortions, which develop a distortion field, have no ends at the border of matter-bodies. Overlapping of two distortion fields, may change distortion-densities on either side of a matter-body. Tendency of 2D energy fields, to achieve homogeneity, tends to move distortions in it, from higher distortion-density region to lower distortion-density region. Transfer of distortions in 2D energy fields carries the matter particles, which are producing the overlapping distortion fields, to move them in space. This phenomenon appears as attraction or repulsion between the matter particles under 'field forces'. Displacement of a matter-body in space is an inertial action. During this motion, additional distortions are created within the matter field of the bodies to change their state (of motion).

In order to simplify explanations on distortion fields, complicated nature of 2D energy field-distortions in a distortion field (in a plane) may be resolved into various components. There are three possible varieties of distortions in a 2D energy field (latticework structure in a plane) – linear, angular and radial. Direction of a component of a distortion field is indicated by imaginary 'lines of force'. If (linear) directions of two interacting components of distortion fields are in opposite directions, they tend to neutralize each other. If (linear) directions of two interacting components of distortion fields are in the same direction, they tend to enhance each other

Linear distortion field:

Latticework squares of 2D energy fields in a linear distortion field are compressed or expanded in the same linear direction. Lines of force are straight lines with arrows at outward end. Interaction between linear distortion fields gives rise to 'magnetic' nature of distortion fields. Hence, linear distortion fields are 'magnetic fields'. Since there are no matter-bodies that can produce linear distortion fields, they can be produced only by arranging number of bitons (or other fundamental particles) with angular distortion fields, in suitable array. End of a linear distortion field, from where the lines of force appear to come out (of the body producing the distortion field) is its 'North pole' and the end of linear distortion field, to which the lines of force appear to enter is its 'South pole'. A magnetic line of force points towards south polarity.

A small part of a curved line of force, of sufficiently large radius of curvature, acts as a linear line of force. Hence, an angular distortion field (electric field), where its lines of forces have less than certain magnitude curvature, acts as linear distortion field (magnetic field). This phenomenon causes inseparable association between electric and magnetic fields.

Angular distortion field:

Latticework squares of 2D energy fields in an angular distortion field are distorted in angular direction. Lines of force are curved lines with arrows in clockwise or anti-clockwise direction. Interaction between

two angular distortion fields gives rise to 'electric' nature of distortion fields. Hence angular distortion fields are 'electric fields'. Constituent photons in bitons move in circular paths. Unstable inertial pockets of these photons angularly deform 2D energy field latticework to produce angular distortion fields. Hence, all bitons (and other superior particles being unions of bitons) have angular distortion fields.

Due to the angular nature of an electric field, its lines of force are (partly or fully circular) curved lines, in the (resultant) direction of motion of photons in the bitons. Looking from one side, electric lines of force appear clockwise. This side of the electric field is the 'positive electric charge'. Looking from the opposite side, electric lines of force appear anti-clockwise. This side of the electric field is the 'negative electric charge'. Electric charges are relative directions of an electric field. Since they are relative directions, electric charge of an electric field depends on the reference used. Electric charges have no independent existence as is believed today. Every electric field has both positive and negative electric charges. Both, electrons and positrons, have similar electric fields with both positive and negative electric charges.

Field forces or inertial actions on corresponding bodies, produced by interaction between two electric fields, not only depend on the type of electric charges (relative directions of electric fields) but also on the distance between their centres of curvature. At certain distance ('zilch force distance') between two electric fields, they produce no 'field forces' or inertial motions of corresponding matter-bodies. Beyond zilch force distance, due to lower curvature of lines of force, magnetic nature of the distortion fields dominate and electric fields behave like magnetic fields. Electric nature of electric fields (during interaction between two angular distortion fields) is exhibited only when the distance between them is less than 'zilch force distance', where their lines of force have greater curvatures.

It is a geometrical necessity to have axes of an electric field and corresponding magnetic field, perpendicular to each other. An electric field with lower curvature is often mistaken for a magnetic field, whose axis is at right angle to electric field's axis.

Radial distortion field:

Latticework squares of 2D energy fields in a radial distortion field are distorted in linear directions, radially towards or away from a central point. Its lines of force are straight lines with arrows, radiating towards or away from a central point. Interaction between two radial distortion fields gives rise to 'nuclear' nature of distortion fields. Hence, radial distortions in 2D energy fields are a 'nuclear field'. Nuclear fields are usually produced only by electrons and positrons. Under specific conditions, certain very large macro bodies (towards end of their life) also produce nuclear fields, which may cause their destruction by explosion. Very high intensity explosions also cause nuclear fields.

If distortions (lines of force) are directed outwards from the central point, they produce 'repulsive nuclear field'. Fundamental particles, associated with repulsive nuclear field (the electrons), apparently repel all other primary and fundamental particles. If distortions (lines of force) are directed inward towards a central point, they produce 'attractive nuclear field'. Fundamental particles, associated with attractive nuclear fields (the positrons), apparently attract all other primary and fundamental particles. Due to geometry of 2D energy field structure, nuclear fields cannot add to each other.

Aether drag:

It was the failure to notice an assumed 'aether drag' on earth during its motion through space that ended progress in the search for an all-encompassing universal medium. This was unnecessary because the assumption of aether drag itself is unwarranted. In the explanations, given above, it was shown that every 3D matter particle – photon – is moved by 2D energy fields at the highest possible speed. Photons, constituting primary particles, fundamental particles and higher matter bodies move in circular paths, which are limited within primary particles. A macro body consists of millions of photons, moving in very small circular paths, within its body. Any motion of the macro body is achieved by simple displacements / deflections of photons' circular paths in space. It is the 2D energy fields that are affecting such motion.

Matter has no ability to move on its own. Since distortions in 2D energy fields, which are being transferred, are displacing a macro body, there will be no relative motion or friction between the macro body and 2D energy fields. Action is limited to 2D energy fields within and in the immediate neighbourhood of the macro body. It is the moving distortions in the 2D energy fields, which are moving a macro body. This part of 2D energy fields is the local region, in and about the macro body. Distortions carry the macro body along with it and there is no relative motion or friction between them. However, with

respect to the vast 2D energy field (outside immediate surroundings of the macro body), the macro body has a relative displacement in space.

Photons, during their motion through the 2D energy fields, experience resistance from the 2D energy fields. Photon's ejection (moving effort) is also caused by the 2D energy fields. Speed of a photon is determined by resultant of these efforts. Resultant linear speed of a photon is the highest possible linear speed through 2D energy fields that can be sustained without rupture of 2D energy fields. Since the resistance from 2D energy fields is already accounted for in the motion of the photons, such resistance will not be carried further into the motion of 3D macro bodies. Therefore, 3D macro bodies will not experience any drag to their motion through 2D energy fields (space).

As a very large macro body (a central body) rotates, it is (currently) imagined to drag functional entities, 'space and time' about it with it. This fictitious drag is assumed to cause rotation of planetary and satellite bodies of the rotating central body. (See article on 'Planetary Spin').

Conclusion:

Having a structured universal medium, in place of form-less and imaginary space has many advantages. An all encompassing universal medium ensures direct contact between every 3D matter particles in the universe. This avoids the assumption of 'action at a distance through empty space'. 2D energy fields in all possible planes, extending infinitely in all directions and filling the entire space, provide an all-encompassing and real universal medium. A steady universal medium provides an absolute reference for all actions and locations of bodies in space. Since the universal medium has a structure, it can deform, contract or expand. It acts as the originator of all actions on 3D matter bodies and apparent interactions between them. Matter is inert; it has no ability to act or move on its own. A universal medium, structured with real matter particles, can logically explain all actions and characteristic properties of diverse matter bodies in nature.

2D energy fields accounts for creation, sustenance and apparent interactions of three dimensional matter-bodies. Actions by 2D energy fields are the result of mechanical movements of its constituent quanta of matter, within their latticework structure. Since distortions in 2D energy fields are the cause of all actions, fundamentally there is only one type of effort in nature, which is currently bifurcated into many types of 'natural forces'. Manner of distortions in the 2D energy fields determine the type of 'natural force' manifested during an interaction. Gravitation and inertia are properties of the 2D energy fields. Perpetuity of 2D energy fields bestows the universe with its 'steady state' of perpetual existence.

We are 3D beings. All our actions and observations are limited to 3D matter bodies. Hence it is impossible for us to observe or act on the 2D energy fields, directly. This does not preclude the existence of 2D energy fields or their actions on 3D matter bodies. If all physical phenomena, related to matter, can be logically explained by this concept of universal medium, it should be recognised as true.

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

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