Chapter TWO

UNIVERSAL MEDIUM

Chapter two defines basic assumption and postulation of this alternative concept. Basic assumption and postulated foundational matter-particle are derived from the fundamental fact of existence of matter-bodies in nature. Whole of this concept is built upon postulated foundational matter-particle. On developing the concept, it is found that the foundational matter-particle, as it is postulated, can provide logical explanations to all physical phenomena, related to matter. Hence, this postulation may be scientifically scrutinized only after whole of this concept, as described in later chapters, is understood.

2.1. Assumptions in physics:

Fundamental aspects of all contemporary laws and theories in physics are that they are based on one or more assumptions (and postulations) about nature of real world. However, omission to state these assumptions along with physical laws (or theories), every time they are used, often misguides a student and causes erroneous beliefs. Different sets of assumptions, used with different theories, aggravate confusion and deprive physics of it status as a comprehensive branch of science. Therefore, all attempts to rethink diverse physical laws and related assumptions should be appreciated. Scrutinizing fundamental assumptions and compiling them into a single set, on which all physical theories are based, will help to remove current perplexity in physics.

Preconceived ideas, used by rational beings to analyze information perceived through their sense-organs, may be in the form of images observed directly by an individual or in the form of assumptions, which are believed to be true. Hence, fundamental assumptions are essential to perceive and understand physical phenomena about which an observer has no preconceived idea by direct experience. As physics is not restricted to certain individuals, basic ideas used in physical theories have to be supported and accepted widely. Assumptions, stated in conjunction with a theory, help to broaden basis of preconceived ideas for all students, with respect to a theory.

Generally, it is considered that assumptions and postulations need not be logical or based on prior reason. No questions on their creation or reason for their existence arise. They are to be recognized as true for purposes for which they are intended. However, all further developments from basic assumptions or postulations need to have logical continuity. Once certain fundamental assumptions are made, it is incorrect to add to it or modify the same, during every step of further development of a theory. Additions or modifications break logical continuity.

Contemporary physics has no single set of basic assumptions. Current practise is to formulate suitable assumptions as and when a new theory is formulated for a

phenomenon that cannot be explained on the basis of a prior set of assumptions, used elsewhere. Another practise is to borrow assumptions used for certain phenomenon to explain apparently similar phenomenon. This may cause gross error in chain of reasoning. As a result, currently we use far too many unrelated assumptions in physics. Imaginary thought-experiments also contributed to growing number of assumptions.

Assumptions are often cast in mathematical form for logical analysis to determine consequences of physical laws and to check if results concur with real world actions. If they do, the assumptions are judged true. Mathematical analysis of assumptions provides a logical description, without any particular reason, how certain phenomenon works in real world. If results do not concur with real world actions, assumptions are judged wrong and different or modified assumptions substituted for original. This process is repeated until current assumptions are proved true in mathematical aspect. This sort of conclusion needs not always be correct.

Mathematics is a self-contained logical system, whose conclusions are true, independently of what happens in real world. If conclusions, based on certain set of assumptions, agree with a particular real world phenomenon; blindly using same set of assumptions for all other seemingly similar phenomena, to derive further consequences, may not assure correct conclusion. As a result, a flaw at any step is carried forward in newer theories and errors in reasoning multiply in geometrical progression. Over-emphasize on mathematical analyses without conceptual reasoning is bound to increase number of baseless assumptions.

There are few assumptions, without which no scientific (or even other rational) thoughts are possible. For example: Physical universe is real, Physical entities have objective reality in space, Space contains real entities, Humans are rational beings with ability to observe, analyse and understand physical phenomena, Human rationalisation itself is based on fundamental assumptions, etc. These assumptions are better discussed at metaphysical level.

In addition to metaphysical conjectures, currently we have too many assumptions in physical theories. Many theories use different sets of assumptions, which often contradict, when taken together. This is neither desirable nor helpful in search for true explanations of physical phenomena. Fundamental assumptions should be as few as possible and they should be applicable identically in cases of all physical phenomena. There is nothing special about any physical phenomenon. They should all be explained on same basis. Theories and explanations (at all levels) should be based on original assumption(s) for their logical continuity.

Original assumption(s) should be logical, consistent and without contradictions. They would require no change, addition or modification as our knowledge increases. Original assumption(s) should be the only supposition(s), which requires no logical basis or prior

cause. This being the case, they cannot be questioned, except for contradictions in their formulations. All other assumptions (if any) will be secondary in nature and they will be derived as conclusions from original assumption(s).

Analysing different phenomena separately causes proliferation of assumptions in physics. This is an easy and convenient method used by physicists. As assumptions are not questioned, a physicist is at liberty to prescribe special set of assumptions for analysis of each phenomenon, to suit desired results, without considering existing assumptions. Every phenomenon is a result of prior causes. Neglecting assumptions, used for prior causes, while formulating new assumptions is not correct. Analysing a phenomenon, in isolation, is like creating a new branch of science. To make physics a comprehensive science, analyses of all physical phenomena should be based on the same set of fundamental assumption(s).

Although physics is the science of matter and its (apparent) actions and interactions, modern theories neglect matter altogether in mathematical analysis and use one of its attributes – mass – for theoretical analysis. This method shifts focus of physics from matter to one of its qualities. Assumptions used for matter are not valid for mass and vice versa. Although matter is the basis of everything in universe, it is hardly discussed as an entity. Use of its qualities, instead of matter itself, leads to many misconceptions in modern physics.

It is equally important to define basic terms used in physics. Most of fundamental terms are not defined at all. Lack of proper definitions causes them to mean differently in different theories and often encourage their misuse. Although colloquial but undefined meanings are alright for general purposes, when used in physical theories they should have properly defined meanings. This will help uniformity and consistency of explanations on various phenomena.

Few of the assumptions, used in current physics, are contrary to scientific wisdom and common sense. Irrespective of their absurdity, they are widely used without questions. Wherever they fail, due to their irrationality, equally bizarre assumptions are substituted. ‘Actions at a distance through empty space’ is one of them. Cause-less random motion of molecules and atoms in kinetic theory of gas is another example. A rational mechanism of actions can help to make physics more realistic and rectify most misconceptions.

Universe and all its constituents are materialistic. All real entities, including rational beings, are made of matter. Therefore, ‘existence of matter’ can be considered as a single phenomenon without prior cause. Existence of matter can be accepted as the only fundamental truth. Consequently, original set of assumption(s) in physics should be related only to matter. All other phenomena occur to, on or about matter-bodies. They have to have prior causes, derived from the fact of ‘existence of matter’. No further assumptions or modifications of original set of assumptions should be required to explain

them. Logical continuity of explanations on all other physical phenomena has to be based on original set of assumption(s) on 'existence of matter'.

Rational beings are constantly trained to relate cause and effect relations in all physical actions. For every action, there has to be a prior cause and every cause is followed by a subsequent action. If cause of an action is known (even if it is based on some assumptions), no further assumptions are required to understand subsequent action. If cause of an action is unknown, a rational being supposes certain assumptions in place of unknown cause.

Existence is something everyone will agree as truth. Everything, including us, exists. Existence of real entities is the foundation of universe. Hence 'existence of matter' can be used as basis for a foundational assumption. To exist is to have objective reality (in space). To have objective reality, an entity should have substance (stuff). All diverse substances in universe are essentially made from same basic substance and in a similar manner.

As far as we know, only matter provides substance to all real entities in materialistic universe. Since 'existence of matter' is lone phenomenon without prior cause, that is the only phenomenon which requires assumption(s). Original reason or cause for all other phenomena is the existence of matter. Without matter, none of these phenomena would exist. Therefore, foundational assumption can be stated as: 'Substance is fundamental and matter alone provides substance to all real entities'. Based on this single assumption, it is possible to develop a viable concept to explain all physical phenomena regarding development of material entities with diverse properties and their interactions, in universe. No other assumptions or imaginary particles are required.

Since real entities exhibit diverse properties, foundational matter-particles (derived from above assumption and which constitute all real entities) cannot have any sort of definite property, except ability to maintain their existence (integrity). Structural arrangements by foundational matter-particles can produce whole scenario of universe, without any other assumptions or imaginary particles. All real entities are created from matter. They are sustained and all their apparent interactions are accomplished and controlled by matter, itself.

A 3D matter-body, by its definition, contains matter. Therefore, it is incorrect to assume virtual or mass-less 3D (physical) objects and their part in any interactions. Various physical objects should all be (basically) identical and obey same basic physical laws under all conditions. It is illogical to assume occurrences of singularities and different applications of same laws, depending on parameters of 3D matter-bodies (at microscopic and macroscopic scales). Nature is simple and logical. Therefore, all physical laws operating in the process of creation and apparent interactions of 3D matter-bodies should also be simple and logical. Complicated or illogical physical laws are unnatural. Irrational assumptions and mysterious 'forces' or their apparent actions are unscientific.

2.2. Entities:

A living being perceives its surrounding or parts of self by identifying them. Perception is accomplished by analysing information gained through sense-organs and comparing them with preconceived ideas, stored in its mind. Perceived entity has distinct but separate existence from the perceiver (its mind). Perceived entity may be real or imaginary. Real entities have physical existence, while imaginary entities exist only in mind.

Mind, itself a functional entity, is a combined action caused by changes in numerous living cells of a rational being. Mind has no independent existence from subscribing cells. Mind identifies all entities by similar process of imagination and comparison. However, perception of real entities is aided by sensory perception. Perceiver (rational being) may identify and name an entity. A name is a word (or collection of words) referring to an individual entity or a group, which singles out an entity or group by directly pointing to it. Named entity or group may be real or imaginary.

Rational beings perceive entities by their sensory organs. Perceived information is then processed and compared with previous experiences by rational being's mind to know and experience the entity and its existence. Existence is always particular and individual. This does not mean that all that is perceived by senses are real. Different sensory organs may perceive same object in different ways. Only one of them can correspond to reality.

An entity that is sensed by sensory organs or tangible by spatial standards and is relatively stable in its form is a real object or physical body. A real entity is a thing with distinct existence that can be sensed by rational beings. It has existence in itself. To exist is to have a place in objective reality. A place that contains a real entity is usually understood as space. Although, space is a functional entity and very vague, such a place of existence is always presupposed by rational beings, whenever a real entity is envisaged. No reasons or logical considerations are used for this presupposition, other than empirical evidence that two 3D physical bodies cannot exist in same place, simultaneously. Space acts as an (imaginary) container, without form or structure to contain all real objects.

All physical entities are real. In physics, they are generally referred as bodies or objects. They are assumed to have inherent (apparent) properties of gravitation and inertia. By gravitation, they (apparently) attract each other. By inertia, each real body (apparently) tends to maintain its state of motion or rest. Inertia is assumed to make bodies sluggish to respond to stimulations. Real bodies have substance and they occupy space. Since they have structure, they can be displaced in space; causing their motion or deformation. Hence, physical actions of motion or deformation are real and can happen only to real entities.

Existence is recognized by rational mind. This may be the result of correct or incorrect sensory perceptions or it may be by mere thought-process. If existence is recognized by sensory perception, in order to exist, substance needs a place. Hence, it is essential for a rational mind to presuppose a space for existence of a real entity. This is how we created functional entity of space in universe. Space is purely a functional entity. Its sole function is to provide a place of existence for real objects. It has neither a form, nor a structure nor any physical properties. Such an entity cannot move, distort or act. Functional entities do not require space for their existence. They exist in minds of perceivers.

Some times, it is normal for sensory perception to be unreal. This is where rational being's prior training helps it to rationalize and differentiate between real and unreal perceptions. A stick, partially dipped in water, may appear by sight as a bend body – an imaginary stick. By touch, the stick would appear in its real shape, a straight body – the real stick. Both, imaginary stick and real stick, appear to exist in same location. If they exist in same location, surely they cannot be different but the same entity. In this case, bend stick has no existence but straight one exists in space. Both real (straight) stick and imaginary (bend) stick are perceptions of mind, but by different sensory organs.

Real (straight) stick exists in space and imaginary (bend) stick does not exist in space. Only real (straight) stick occupies space. It is a real entity. It has positive existence in space. Bend stick, perceived by rational being is an imaginary entity. It has no existence in space. It exists only in the mind of perceiver. This is an example of aberration of sensory perceptions. All entities, which have no real existence in space but have their existence only in the mind of perceiver, are imaginary entities. They are functional in nature and fulfil functions assigned to them by rational beings.

An imaginary entity is developed or created from mind's own faculty, without any need to sensory information. Sensory information may some times help to create, develop, change or enhance imaginary entities (e.g.: virtual images). Imaginary entity has no substance or real existence in space. Many functional entities may exist simultaneously, in association with a real entity. Since a functional entity has no substance, it has no form or structure. It can neither initiate nor undergo physical actions. It cannot deform or move.

2.2.1. Substance:

'Substance' is the basic stuff from which everything else is constructed. One common way to identify substance is through its physical properties. In its physical sense, 'substance' is that which exists in itself and does not depend upon anything else for its existence. Attributes or characteristic properties are inherent in (and about) substances and depend on the substance for their existence. Substance (or stuff) provides an entity with objective reality in space. It is because of substance, an entity contains, it becomes a

real entity. Therefore, as far as real entities are concerned, substance is most fundamental. Without constituent substance, there can be no real entities.

The concept of substance, in its generic sense in any philosophical system, is those things, which (according to that system) are foundational or fundamental entities of reality. They are the basic substances from which everything else is constructed. In certain philosophy, impressions and ideas are substances, for same reason. In another, anything that stimulates sensory organs is substance. Yet in another, it provides objective reality in space. Etc. Although in different senses, all philosophical systems acknowledge existence of substances as a particular kind of basic entity. Some philosophical theories acknowledge them as such and others do not. Conception of substance as basic entity derives from our notion of individuality of '*thing*' or '*object*', in contrast with 'properties' of entities and 'events'.

Using epistemological principles, existence of substance may be denied (school of philosophy led by David Hume). It is argued that; since all human knowledge must be traced back to sensation, idea of substance must be also be traced to the same. Since sensory perceptions themselves cannot provide knowledge of substance, no one can know substance, as a distinct stuff from that of a collection of particular qualities or attributes. Thus, substances are nothing but a collection of simple ideas that are united by imagination and have a particular name assigned to them. In its essence, knowledge of aesthetic object becomes knowledge of aesthetic experience itself. This school of thought adopts the approach that puts aesthetic experience first and then examines aesthetic object as an intentional object of that experience. Digital physics also follows similar line of thought. It considers 'information' as the basis of everything else.

These considerations are suitable for functional entities like imaginary particles, art forms, etc. Imaginary entities are created by rational beings in their minds and all their attributes are also subscribed by them. Physically, a painting is nothing but a combination of canvas and paints. It is the rational mind that attributes its integrity, functionality and qualities. However, many scientists, in dealing with modern physics, subscribed to this philosophy to produce exotic theories, based on imaginary particles and mysterious properties, which are acquiescent with complicated mathematical treatments. Simple logical reasoning is not allowed to question their genuineness or logic.

2.2.2. Matter:

Matter is defined as "*material substance that constitutes the observable universe and, together with energy, forms the basis of all objective phenomena"* and the energy is defined as *"the capacity for doing work*" (Encyclopedia Britannica). Matter is a specialized entity associated with energy and has attributes of mass and real existence in space and time. It gives existence a sense of reality. Ability to produce effort or capacity to do work is energy. Hence, matter and energy are distinctly separate entities. Matter being a real

entity and energy being a functional entity, neither of them can be converted or reverted to the other.

Creation and development of 3D matter-bodies requires work. This part of work is intrinsically associated with them and sustains their integrity. A 3D matter-body cannot change its state (of motion) by itself. In order to change its state of (motion), additional work has to be associated with its matter-content. Required additional work can also be transferred from work or additional work associated with another 3D matter-body. Rate of transfer of work is 'force' or 'power'. A change in state of (motion of) a 3D matter-body produces stress in and about the body. This stress is 'energy' invested with 3D matter-body in association with additional work. Energy has no independent existence. It is a functional entity, indicating stress about 3D matter-particles of a macro body, on which certain additional work is done to change its state (of motion). Change in state of (motion of) a 3D matter-body constitutes work.

The term 'matter', traditionally refers to substance that all physical objects are made of. One common way to identify this substance is through its physical properties. All real entities are materialistic. They are material objects made out of matter. Matter is the stuff (substance) that gives real entities their materialistic existence. Matter is a physical substance that occupies space and can be perceived by one or more senses. Matter is distinct from qualities, properties, thoughts, mind and spirit.

Only the matter is real and entities made of matter are real. All others are functional and man-made. Having matter as its content (substance), makes an entity a real object that can be perceived by sensory organs of rational beings. In (Aristotelian and Scholastic) philosophy, matter is in itself undifferentiated and formless and which, when subjected to change and development, receives form and becomes substance of an object. Hence, matter is the substance any physical object consists of or is composed of or simply matter is something that exists in space.

At different stages of history, concept of matter had many variations, in the light of scientific knowledge prevailing at that time, of what are considered as basic building blocks and their interactions. At one stage, different elements were considered as fundamental constituents of macro bodies. Later, different molecules and diverse atoms were considered as basic building blocks and all matter were considered to be constituted by atoms. Still later, matter was viewed as solid, massive and movable (fundamental) particles. As science progressed, smaller fundamental constituents of matter were discovered to change the constitution of matter. Currently, even these fundamental particles appear to be constituted by primary particles of different properties.

In physics and chemistry, matter is assumed to exhibit both wave-like and particle-like properties, the so-called 'wave-particle duality'. Often matter is disregarded and one of its attributes, the mass, is accorded the status of reality. This is true in mathematical

analyses, used in contemporary science. As our knowledge expands, we are likely to discover the most basic matter-particle, in near future.

All matter share certain fundamental properties. Currently, matter is (generally) regarded to have certain properties, as understood from observation of nature. All primary properties of matter are amenable to mathematical description. Nevertheless, its secondary properties (or qualities) are not considered mathematically. Although, mass of a matter-body is a measure of its inertia, it is commonly taken as a measure of amount of material contained in a matter-body. Matter in bulk may have several physical states of existence in nature.

Matter has many definitions in physics, but the most common one currently used is that it is 'any substance, which has mass and occupies space and exists in one of the physical states'. Another definition of 'matter is anything that has mass and occupies a volume'. All physical objects are composed of matter, in the form of atoms, which are in turn composed of protons, deuterons, neutrons, electrons, etc. Currently, photons are assumed to have no mass, so they are an example of something in present-day physics, which is not comprised of matter. As photons cannot remain static, they are also not considered as objects, in traditional sense. In cosmology, the term matter includes dark matter and dark energy; concepts used to explain some anomalous phenomena observed in universe. These exotic forms of 'matter' do not refer to matter as substance that occupies space but rather to unknown entities of mass and energy.

Definition of matter is revised in light of quantum mechanics, where concept of 'having mass', and 'occupying space' do not have same meanings as in everyday life. Some similar theories hold the view that physical bodies are made of several substances and properties of matter (including, mass and volume) are determined not only by constituent substances themselves, but by how they interact. In other words, matter is made up of interacting 'building blocks'. According to special theory of relativity, matter (considered as mass) and energy are equivalent. Accordingly, mass (matter) can be converted into energy and energy into mass (matter). Usually, matter is ignored altogether in this theory. Mass usurps its place.

In this concept, all real entities (bodies and objects) in nature are regarded as physical bodies made of matter. They can be in any spatial dimensional status but they occupy space. In their 3D spatial status they can be perceived by sensory organs. In their 1D and 2D spatial status, they are not perceivable by sense organs. Hence, regardless of their reality, they may be considered as functional entities.

In order affect each other, it is essential that matter-bodies are in contact. Contact may be established directly or through a real medium. To have contact between two points in space, entire space has to be filled with real entity. No place in space can be left vacant. Thus it is necessary that matter fill the entire space.

We have three spatial dimensions. We are 3D living rational beings. Generally we deal with 3D macro bodies. All macro bodies are composite and are structured by component matter-particles. Basic matter-particles cannot have different properties. They have to be made of ultimate and only substance in nature. They will behave identically under same conditions. Since matter alone can provide a real body with positive existence in space, basic particle in nature has to be made of pure matter. Since it has no sub-structure, it is a bit of pure matter with no particular properties or abilities, other than its ability to stay as a single physical body. In order to avoid self-dispersal of its matter-content and sustain it integrity as an independent physical body, its matter-content has to have certain affinity within itself.

2.2.3. Macro bodies:

All macro bodies are constituted by smaller and inferior 3D matter-particles. Each of these 3D matter-particles is, itself, an independent macro body, in its own right. Any physical object formed by combination of two or more basic 3D matter-particles is considered as 3D matter-particle, a 3D matter-body or a macro body in this concept. These include primary particles, fundamental particles, atoms, molecules, elements, etc. until the largest of macro body in nature. Integrity of a macro body is preserved by (apparent) attractions between its constituent matter-particles. Simultaneously, fusion between constituent matter-particles is prevented by (apparent) repulsion between them. Incessant balancing of apparent attraction and repulsion maintain integrty of macro body. Relative magnitudes of (apparent) attractions and (apparent) repulsions between matter-particles of a macro body determine many of its properties.

Because of sub-structures of a macro body, range of (apparent) repulsion between 3D matter-particles (of a macro body) is relatively short and range of (apparent) attraction between 3D matter-particles (of a macro body) is enormous. Every 3D matter-particle, with sub-structured matter has (apparent) attraction and (apparent) repulsion (within range) with every other sub-structured 3D matter-particle. Magnitudes of these efforts between two points in space are sum of efforts by all sub-structured 3D matter-particles, between these points. Both, (apparent) attraction and (apparent) repulsion are additive efforts and has inverse relation to (square of) distance.

Additive inter-particle efforts in a free macro body tend to gradually reshape it towards perfect geometrical shape in its spatial dimension. Depending on distribution of matter-particles, a macro body may attain critical stability of its shape as a perfect circular plane in 2D spatial system. Minute instability in circular shape compels macro body to reshape itself as a perfect sphere in 3D spatial system. This process may also induce spin motion of macro body, in space. Therefore, we may consider that it is natural tendency of a free macro body to strive towards spherical shape (with or without spin motion) in 3D space.

2.3. Space:

Space is treated differently in diverse aspects. In physics; 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 universe have their relative as well as absolute positions and motions in space. Space, itself, has no material existence. It cannot provide sensory experience to rational beings, like real entities do. It is a functional entity that serves the purpose of containing and locating various material bodies in it and where rational beings relate themselves with each other. In this sense, the extent outside 3D material bodies, becomes the space. In order to achieve reality, space has to be filled entirely (without voids in it) by material entity (or entities).

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 actions. In order to be perceived, an object has to be real, i.e. it should have positive (real) existence. With respect to 3D rational beings, only 3D matter-bodies can be implied to have positive existence. Only 3D matter-bodies are tangible in 3D spatial system. Unlike functional entities, two or more (real) 3D entities, with positive existence, cannot simultaneously exist in 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 3D 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 existence for any real body. This does not happen in case of functional entities, like; emotions. In this sense, space appears to have a physical reality, which solely depends on existence of 3D (real) material objects in it.

As a result, 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 universe. Possibility of arranging an unlimited number of 3D matter-bodies next to one another denotes that 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 entire space. In most of these theories, aether replaced space by filling it entirely. Therefore, all properties assigned to functional entity of space could be properties of aether, a real entity. Although aether, in most of 'aether theories', had an ambiguous form but it was regarded as a real entity by many. Since aether was considered real, it could deform, move or otherwise interact with 3D material objects. Unfortunately, no one could describe a satisfactory logical structure or properties for any of different kinds of aether, proposed. Different types of aether were envisaged at different times in the past. Usually, 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 nature of light and structure of 3D matter-bodies became better defined, even if they were on imaginary basis. Since there is no accepted definition of aether, scientists concentrated their effort to find and measure an assumed effect, aether may make on other macro bodies. For this they assumed, when a large macro body moves through aether, it should essentially experience a drag due to friction between the two.

Aether theory was seriously weakened (1881) by Michelson-Morley experiment, which was designed specifically to detect resistance to motion of Earth through aether. Experiments showed that there was no such tangible effect. Finally, when existence of aether could not be proved experimentally (based on illogical theories) majority of scientists abandoned the concept of (real) aether. They returned to more mysterious concepts of empty space and fields. Aether could have won the day if it could be explained that it is a real entity with definite structure, in direct contact with 3D matter-bodies and it could move enclosed 3D matter-bodies without appreciably moving itself, but at the same time without any relative motion between moving macro body and aether.

Everyday-experience of natural phenomena shows mechanical things are moved by contact between a 'force-applying body' and a 'force-receiving body'. [The term 'force' is used in its general meaning to indicate an effort that causes action]. Thus, logically, we came to conclude that for any action to take place between two 3D matter-bodies there must be a contact between them. The contact may be directly between 3D matter-bodies or indirectly through a medium that is in direct contact with both 3D matter-bodies.

Nature of this contact is expressed by action of an effort between them. Any 'cause' and its 'effect' without a discernable (direct or indirect) 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. Actions, at a distance or without preceding cause or by thought-process are usually credited to super-natural phenomena.

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

For convenience of having references within space, for various purposes, space is partitioned by different methods. Most convenient method is to partition space about a point (of origin) by three mutually perpendicular planes passing through the point. This gives us 3D spatial system. Location of a 3D matter-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 point of origin and the added plane is perpendicular to all other three planes passing through point of origin. This makes additional spatial dimension an impossible proposition, at least in contemporary geometry.

Space is also viewed only as a conception. Since space provides an extent for 3D material-bodies to exist, concept of '3D material-object' is necessary to define space. 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 sensory experiences are required to understand universe or actions in it. Although this argument overlooks that presence of 3D material-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,

space is often linked with another functional entity 'time', to form yet another functional entity called the 'space-time continuum'.

Space is a functional entity, which has no real existence. Space is a region, where matter-bodies exist and it can be said that region between or around 3D matter-bodies is space. Space is where we presume 3D matter-bodies exist and interact. Without 3D matter-bodies to exist, space has no meaning. Space, being a functional entity, it can only fulfill functions assigned to it. Since it is not a real entity with a form or structure, it can have no physical properties. It can neither bend nor expand nor contract. Dimensions of space indicate distances between 3D matter-particles/bodies. The statement that 'space extends to infinity' means that 3D matter-bodies can be found, however far and beyond. Space provides a place of existence for real (matter) entities. It has no other functions.

2.3.1. Fundamental dimensions:

Matter and its (apparent) interactions dominate our world. Matter provides a sense of reality to nature and our existence. In order to understand matter-bodies and their (apparent) interactions, as rational beings, we need to relate one matter-body to others and relate a matter-body in one state to same matter-body in a different state. This can be done only by comparison between different matter-bodies or same matter-body in different states. For this reason, dimensional measurements are formulated. To define a dimensional measurement, we need to have a reference. Nearer to an absolute standard a reference is, better is the defined accuracy of dimensional measurement system.

A matter-particle (or a matter-body) has only two types of basic dimensional measurements. One type of measurement is of its matter-content (quantity of substance). Since we have no reference for this (to compare with), we are unable to formulate a suitable dimensional measurement system for direct measurement of matter-content of a matter-body. Instead, we are compelled to represent matter-content of a matter-body by using indirect means, related to known or derived references from other dimensional measurement systems. Consequently, we do not have fundamental measurements, to quantify matter-content of a matter-body, directly.

Second type of dimensional measurement of matter-bodies is relation between different matter-bodies or between different parts of same matter-body in space, represented by distance or separation (or displacement) between their locations. Distance may be defined as 'quantitative measurement of spatial interval between two locations', measured along a real path connecting them. It is a scalar measurement with only magnitude as its attribute. Distance is the sum of length, traveled along (shortest) path of motion between two points. When path of travel is curved, distance has slightly different meaning. Separation or displacement may be defined as the 'quantitative measurement of spatial interval between two locations', measured along shortest path

connecting them. It is a vector measurement with both magnitude and direction as its attributes.

In order to formulate a dimensional system of measurement for distance, we presume to have a reference. At different times of history, different references were used to define unit of measurement for spatial interval. Some of the references, used at various times, are distance between 'tip of nose to the end of farthest finger on outstretched hand', 'distance from equator of earth to its north pole', 'length of a precisely cut metal bar kept in a vault outside of Paris', 'certain number of wavelengths of a particular type of light', 'speed of light presumed as a constant', etc.

It is generally understood that displacement of light in space keeps (almost) a constant speed. In order to make this as a reference, useful to define distance, we invented a functional entity – 'time' – to represent equal intervals of changes in physical properties of certain 3D matter-bodies. We can measure distance traveled by light in a unit interval of certain physical changes (unit time) of a reference body/system. This distance (which is believed to be a constant measure) is currently used by us to define or relate our units of measurements for distance in space. Any other reference, which provides similar or better convenience, may also be used to define distance.

Currently, one meter is defined as the distance, light travels through vacuum in $1/299{,}792{,}458^{th}$ of a second. Since space has no real existence, it cannot be measured. Therefore, as far as three-dimensional rational beings are concerned, displacement or separation is a measure of expanse between points on 3D matter-bodies rather than a measure of space between these points.

As seen above, distance is the only measurement related to real objects in nature, available to us. In addition to matter-content (measured in terms of mass) and distance (measured in terms of displacement), five more associated or derived measurements are also currently included in the group of fundamental dimensions. They are time (derived from motion), electrical current, temperature, amount of chemical substance (measured in terms of number of molecules) and luminous intensity. Two other supplementary measurements, plane angle and solid angle, are also listed along with fundamental dimensions. All of these are relative or derived measurements based on appropriate assumptions.

2.3.2. Space as a reference:

Distance in space could be in any direction and it is necessary to define a datum, for distance measurements to be meaningful. There are many ways to do this. Most convenient and widely used method is to divide space about a point into eight parts by using three, mutually perpendicular, spatial planes passing through the point and then use these imaginary planes or their co-ordinate axes as references, to indicate locations

of points in space. Dimensional measurements used in these spatial planes are usually given separate names, viz: length, breadth and depth (or thickness). This system of measurements, in three mutually perpendicular planes, is 'three-dimensional (3D) spatial system' of measurements.

Although measured entity – distance – is the same, because of association to different reference plane, measurement in each direction in 3D spatial system came to be regarded as separate fundamental spatial dimensions. In 3D spatial system, we have three fundamental spatial dimensions and we can measure length, breadth and thickness of a 3D matter-body. In 2D spatial system, we have two fundamental spatial dimensions and we can measure length and breadth of a 3D or 2D matter-body. In 1D spatial system, we have only one fundamental spatial dimension and we can measure only length of a 3D, 2D or 1D matter-body. Therefore, whenever dimensional status of an entity is mentioned, only its spatial dimensions are intended.

Although, they are called by different names, in all these cases, dimensional measurement is distance. In order to create higher spatial dimensional systems, we have to partition space by higher number of mutually perpendicular (?) planes by some logically consistent means (with respect to us, the 3D beings), which at present seems to be improbable. Thus, we have come to regard space as a 3D functional entity. In 3D spatial system, no higher spatial dimensions are envisaged. All measurements of distance in higher spatial dimensional system, if any, are regarded as negligible or meaningless.

As far as 3D spatial system is concerned, there are no distances in higher-dimensional spatial systems, to be measured. Higher spatial dimensional systems cannot be used to describe 3D matter-bodies or their apparent interactions. Such uses, as is presently done in many theories, are not rational. By definition, a 3D matter-body can exist only in three spatial dimensions. A physical matter-body can be envisaged as a 4D matter-body only when we can partition space by a fourth spatial plane in addition to the three spatial planes already considered. All cases of higher dimensional systems are akin to this (unless 'dimension' is intended to represent some other 'functions in equations' or 'parameters of events'). Angular system of measurements also uses 3D spatial system.

Since matter-content of a matter-body has no reference for direct comparison, we have practically only one type of basic measurement. That measurement deals with only distances. Matter-bodies occupy space. Fundamental measurements of a matter-body are tangible representation of space occupied by its matter-content. As a macro body is formed by basic 3D matter-particles with lot of space between them, space occupied by a macro body includes space occupied by its matter-content in the form of basic 3D matter-particles and space between them within borders of macro body. Within 3D spatial system, we are free to use, two mutually perpendicular datum planes or lines as 2D spatial system or use a single datum line as 1D spatial system.

We also use derived dimensional units of measurements to represent 'mass' of a matter-body. In this case, mass is assumed to represent matter-content of the matter-body. Mass of a matter-body is an attribute. It is a mathematical relation between an external effort, acting on a matter-body and matter-body's acceleration. Acceleration is measured in terms of distance and time. However, rate of action of an effort – 'force' − is defined in relation to unit mass (circular logic?). We are compelled to do this, because we have no formulated measuring system for matter-content of a matter-body. Matter-content of a matter-body cannot change unless matter is added to it or removed from it. Nevertheless, mass of a matter-body is liable to change, depending on its state of motion. Mass of a matter-body tends to increase with its absolute (?) speed. This has caused some confusion in our understanding of fundamental science. This part will be explained later in this book (See section 5.2.5).

We may consider 3D spatial system as a combination of three 1D spatial systems, coexisting in nature. Thus, we also have 1D and 2D spatial systems in nature. We live and act in 3D spatial system. [In this text, adjective '3D' represents three-dimensional, adjective '2D' represents two-dimensional and adjective '1D' represents single-dimensional (spatial systems)]. We, being rational '3D beings', only 3D matter is considered by us as 'real matter'. Due to our intelligence, we are able to visualize and understand (up to an extent) 2D and 1D spatial systems, but it is impossible to visualize or understand higher-dimensional spatial systems, if any. As far as '3D beings' are concerned, all higher-dimensional spatial systems are unreal and beyond our imagination.

In 3D spatial system, length, breadth and depth (all are distances), each one in a coordinate plane represents space. Magnitude of distance in imaginary fourth spatial dimension (which is not yet defined or understood) is negligible compared to units of measurement in three spatial dimensions. Magnitude of distance in fifth spatial dimension, if any, is negligible compared to units of measurement in fourth spatial dimension, etc. In order to sense reality, we do not need higher spatial dimensions and, as far as we are concerned, they do not exist in reality.

Similarly, in 2D spatial system, there are only two tangible spatial dimensions − length and breadth. Third spatial dimension, depth, is negligible compared to these two spatial dimensions; fourth spatial dimension is negligible compared to third spatial dimension, etc. In 1D spatial system, there is only one tangible spatial dimension − length. Second spatial dimension is negligible compared to first spatial dimension; third spatial dimension is negligible compared to second spatial dimension, etc.

Consequently, when we are dealing with a 1D matter-body, it should be understood that such a matter-body has its existence in all other spatial dimensional systems also. It exists in space. It is up to us how we partition space and define spatial dimensional systems. Since a 1D matter-body exists in space; it exists in all spatial dimensional

systems, the space is assigned to. By using any particular scale of measurement, its existence in all spatial dimensional systems, other than first spatial dimensional system is negligible. Because, as far as measurement system is concerned, no other spatial dimensions exist. That is, only its length can be measured.

If same entity is scrutinized (by a '3D being' in 3D spatial system) in its most minuscule details, it should have its existence in all spatial dimensional systems, used by the examiner. In addition to its length, we must consider that a 1D matter-body has negligible width and negligible thickness. E.g. To exist in space, a line has to have certain breath and thickness, even if magnitudes of these measurements approach zero.

Similarly, in 2D spatial system, only length and breadth can be measured. Depth or thickness is so minute that it cannot be measured by any method used by us – the 3D beings. Spatial dimensions, related to higher spatial dimensional systems do not exist in this particular measurement system. Yet, a 2D matter-body exists in space. Under these conditions, we may consider such negligible measurements as functional quantities rather than real quantities. Because, they are not tangible by using any real measurements used by us. A 2D matter-body or a plane has negligible thickness in addition to its length and breadth, so that it can exist in space. E.g. To exist in space a plane has to have certain thickness, even if its magnitude approaches zero.

Since we live and operate in 3D spatial system, we are unable to comprehend any dimensional spatial system higher than ours. It is difficult to visualize even a 2D spatial system. To be real, measurements in a fundamental dimensional space should be tangible and it should describe (separation in) space or matter-content. Since we have no fundamental measurement for matter-content, we are left with only one spatial-dimensional measurement in all three fundamental spatial dimensions. In each fundamental spatial dimension, it describes expanse of (separation in) space. It measures distance between matter-bodies or between parts of matter-bodies.

Because of its functional property, time cannot be considered as a fundamental dimension in any dimensional spatial system. It comes into existence only when there is motion and because of motion. It qualifies an action or a change of state. Time does not describe space or matter-content. As soon as first basic 3D matter-particle was created, due to its inherent nature of motion, a functional property of time also came into existence, for rational beings like us.

Time has no tangible existence. Scale and measurement of time is always related to some motion or change of state of matter (bodies). Hence, time should be considered as a character of (motion of) matter rather than a dimension of space. In some mathematical (analytical) solutions, time is also used with other fundamental spatial dimensions to describe (history of) events in space. This has led to an erroneous belief that time is a

fundamental spatial dimension. Thus, time has come to be regarded by many, as fourth dimension of space. (See section 17.1).

2.3.3. Dimensional spatial systems:

In nature, different dimensional spatial systems co-exist and influence each other. Basic spatial system is that of two-dimensional. All other spatial systems are created out of and exist within and about 2D spatial system. Efforts, in higher-dimensional spatial systems, have their origins in 2D spatial system – produced by 'foundational matter-particles'. These efforts are then carried on to have their effects in higher-dimensional spatial system.

Presently, many interactions between 2D and 3D spatial systems, are assumed as originating in 3D spatial system and between 3D objects. Observed interactions are then analyzed and explained on this basis. Wherever satisfactory explanations cannot be provided, imaginary properties or virtual objects are introduced to provide suitable results. At least in some cases, unexplainable interactions are relegated to realm of super natural. When existence of 2D spatial system and its effects on our 3D world is recognized and accepted, many of these phenomena will have simpler explanations.

Let us consider a 2D intelligent 'being', living in a 2D spatial system. As far as that 'being' is concerned, there are only two fundamental spatial dimensions – length and breadth, and a circle is the perfect geometrical shape. Even if this 2D 'being' itself is a part of a 3D matter-body, it will not be able to visualize anything outside its own dimensional spatial system and hence this 'being' will not be aware of third spatial dimension at all. Our case is also similar to this 2D 'being'. We are 3D 'beings' and hence we are not be able to visualize fourth spatial dimension or comprehend a 4D spatial system. Our world is limited within three spatial dimensions and our perfect geometrical shape is a sphere.

Some of contemporary theories dealing in higher-dimensional spatial systems (four, nine, ten, eleven, twenty-nine, etc.) can only be regarded as manipulation of functions in mathematical equations. These types of manipulations are normal in analytical geometry to describe events. However, they cannot be considered as real measurements to provide conceptual explanations of physical phenomena. In analytical geometry, a point is defined by a set of real numbers (or notations). Thus, study of ten or twenty-nine or 'n' dimensional geometry is nothing but study of algebra with ten or twenty-nine or 'n' variables. This is what study of dimensional geometry means. Use of geometric terminology like calling a set of ten or twenty-nine or 'n' real numbers a point, is merely a convenience. Unless these dimensions are interpreted pictorially as physical dimensions in space, they should not cause any mystery.

Our spatial understanding is three-dimensional and even in three dimensions; our understandings cannot be trusted without aid of rational thinking and experience. All

other spatial realities appear to be unreal to our rational reasoning. Dimensional spatial systems explained in this book is about physical dimensions of expanse of (separation in) space. A matter-body of 1D spatial system can exist and act only in its own dimensional spatial system – a straight line. A matter-body of 2D spatial system can exist and act only in its own dimensional spatial system – a plane. We being 3D entities, 1D spatial system may coincide with any straight line in our 3D spatial system and 2D spatial system may coincide with any plane in our 3D spatial system. Thus, a 1D matter-body may exist or act along any straight line in our 3D spatial system. Similarly, a matter-body of 2D spatial system can exist and act only in its own plane. This plane may coincide with any plane in our 3D spatial system. Each of the planes in 3D space has a different 2D spatial system. They can never interact directly with each other.

2.3.4. Necessity of universal medium:

Whenever the concept of space is unable to logically explain physical phenomena or nature of transmission of certain physical actions and effects over a distance is not understood, even today, aether (in different forms of various fields or mysterious force-carrying particles) is resorted to, as a conceptual solution of 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 aether. 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 others and suits only a particular theory. Each one of them proposes different types of fields or structure with vague properties of aether; but 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 logically valid 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 theories. It should be a faithful servant, rather than master.

Almost every one accepts 'action at a distance through empty space' as an illogical concept. Search for a logical concept to explain direct actions started very early in the history of natural philosophy and continues to date without much success. Various types of imaginary entities, like different types of 'aethers' in aether theories, used in past, were not very successful to provide logical media, for many reasons. Different types of aethers, proposed in these theories, had no uniform constituents, structure or properties.

Although, most physicists now discard concept of aether, currently, we use many similar undefined concepts in conjunction with various phenomena, to bring certain logic to their actions.

Even when we advocate non-existence of media of actions, we use and believe in many types of media of actions, like; imaginary particles with mysterious properties, different types of undefined fields, structure-less space with physical properties, mathematical constructs like space-time continuum, etc. Use of these concepts with widely varying and indefinable properties indicates dire necessity for a universal medium, without which physical phenomena cannot be logically understood. Hence, quest for a unified theory should start with a formulation for logical development of an all-encompassing universal medium.

2.3.5. Ideal universal medium:

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' will then mean 'universal medium' and vice versa.

A logical universal medium should be a real entity. It should have objective reality and exist in space. Matter alone can provide substance, required for objective reality and positive existence in space. Therefore, it is imperative that an ideal universal medium should be made of matter, the same entity out of which all basic 3D matter-particles and macro bodies are made of. However, we (the rational beings) consider only 3D matter as real. Hence, irrespective of the fact that only 3D matter-particles are considered real, matter should be able to structure universal medium also. Because of this requirement, it should be possible for matter to exist in different forms other than 3D status, without losing its identity as matter and its objective reality.

An all-encompassing universal medium, made of matter, may be envisaged to fill entire space, outside basic 3D matter-particles, including inter-particle space in macro bodies. To fill entire space is to have positive existence in space in all spatial dimensions, without voids in them. In order to have positive existence, universal medium has to be a real object. Reality of an object is provided by its substance. In nature, matter alone can provide substance to real entities. Hence universal medium has to have matter-content. It can be made of matter or matter in the form of small matter-particles. To be made of small matter-particles is to have definite structure. Contents and structure endows an object with its properties. Hence universal medium has to have definite structure and properties, derived from its constituent matter-particles.

A foundational (most basic) 3D matter-particle contains matter without voids in it. Whole space, occupied by a basic 3D matter-particle, is occupied by pure matter. Universal medium fills the entire space outside these 3D matter-particles. There are no voids in it, either. Hence, entire space outside basic 3D matter-particles is also filled with matter. In order to satisfy this requirement, matter-density of a basic 3D matter-particle and matter-density of universal medium, outside basic 3D matter-particle, should be the same.

Yet, while basic 3D matter-particles and matter-bodies formed by them are tangible and can be sensed, universal medium and its components should remain intangible and hidden from 3D rational beings. Entire universal medium, along with basic 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 basic 3D matter-particle or that of universal medium. A matter-body of zero volume and infinite mass (singularity) is impossible to achieve.

Universal medium should be produced by (real) foundational matter-particles under a definite mechanism of formation. All its actions, interactions and properties will have to be derived from properties of constituent foundational matter-particles. Since matter alone can form universal medium and diverse 3D matter-bodies, all properties of both, universal medium and 3D matter-bodies, should be derived from most foundational matter-particles in nature.

No assumed particles, imaginary properties or mysterious interactions should be necessary to understand any physical phenomenon. Actions of foundational matter-particles in 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; from gravity to nuclear interactions; etc.

Universal medium should be a self-sustaining material body. By its inherent properties, 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 inherent properties of universal medium. These properties should be derived from properties of universal medium’s constituent foundational matter-particles.

All basic 3D matter-particles (and superior matter-bodies made up of basic 3D matter-particles) should exist within universal medium. Universal medium should serve as interlink between every basic 3D matter-particle in universe. Since there are no direct contacts between 3D matter-bodies and all 3D matter-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 3D matter-bodies or those actions which appear as actions by 3D matter-bodies, in nature, should be performed by universal medium outside basic 3D matter-particles. Universal medium should contain all 3D matter-bodies and hence form a common link between them. Each 3D matter-body should be acted upon by universal medium separately. Simultaneous actions by universal medium on different 3D matter-bodies will appear as an interaction between 3D matter-bodies. Having a universal medium that is in contact with every basic 3D matter-particle in universe does away with illogical assumption of 'actions at a distance through empty space'.

Since universal medium pre-exists all 3D matter-bodies and no 3D matter-body 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, universal medium has to create basic 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 universal medium to create and destroy 3D matter-bodies cyclically and in different localities in universe. This should be done by gradually destroying macro bodies in certain regions to revert their matter-contents back into universal medium, while creating macro bodies, using matter-contents from universal medium, in other regions. This will not only maintain integrity and stability of universal medium, it will also regulate entropy of universe within limits. A stable universal medium should be able to sustain a steady-state of universe, perpetually.

Rational beings are (3D) macro bodies, who are able to sense only 3D objects. Since universal medium or its components remain intangible and hidden to 3D rational beings, they should have their status in 1D or 2D spatial systems. 3D rational beings will be unable to sense them directly. Although foundational matter-particles have real existence in space, magnitudes of their spatial dimensions will be too small to be tangible or sensed by using 3D 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 'ability to do work' that is currently called 'energy'. A 3D matter-body contains nothing but matter, which is incapable to do work. Hence, 'ability to do work' should be stored outside 3D matter-bodies but in association with them. Universal medium, surrounding basic 3D matter-particles or in and about a macro body is an ideal place to store 'ability to do work' and 'work' itself. Transfer of work (in part or full), associated with one macro body, to another macro body may be understood as doing work by first macro body on second macro body. In this process, first macro body utilizes its 'ability to do work' (energy) to accomplish work of second macro

body. In order to act on 3D matter-bodies, universal medium should have 'ability to act' (energy), stored in association with every 'force-applying' macro body, which may be transferred during an action. That is, universal medium should be able to transfer work from one region in it to another.

Actions are recognized by motion (displacement) of 3D matter-particles/bodies. Macro bodies move by sequential displacements of their basic 3D matter-particles, starting from the point of application of external effort. Basic 3D matter-particles, nearest to 'force-applying mechanism', move first. This, in turn, compresses universal medium between displaced basic 3D matter-particle and basic 3D matter-particle in front. Inherent property of stability causes compressed part of universal medium to return to its original form by expanding. Expansion can be achieved only by pushing basic 3D matter-particles, on either side of compressed region, away from each other. Since basic 3D matter-particles at the point of application of external effort are displaced forward and held in place, basic 3D matter-particles in front have no options but to move forward.

Similar repetitive actions, between basic 3D matter-particles of a macro body, cause its displacement in space, during action by external effort. 'Energy-transfer' in or by macro bodies, essentially requires a universal medium between their constituent basic 3D matter-particles. Functional entity of 'energy' can also be transferred through universal medium in the form of invisible disturbances, like: 'electromagnetic waves', 'field-disturbances', etc. Since no displacements of basic 3D matter-particles are involved in this process, universal medium, itself, has to act as an agent of 'energy-transfer' by its own compression and expansion.

Universal medium should be stable but deformable real entity. Deformations are displacements and hence tangible. Displacements, caused by deformations, in universal medium are 'work' and it is tangible. A tangible entity is real. Hence, work is a real entity. 'Ability to do work' could be stress produced in universal medium due a strain or distortion in it. Ability to act or to do work is called 'energy'. Hence, universal medium acts as a storage for 'energy'. Unlike stress, strain or displacement in universal medium is tangible and hence real. Stress accompanies strain in a stable system. Hence, strain in universal medium about a matter-body is 'work' and associated stress is its 'energy'. Energy has no independent existence and it is a functional entity. It appears as a shadow of work.

A useful medium should be universal in its character. It should extend infinitely in all directions. It should be reasonably isotropic, homogeneous, self-sustaining, stable and static under all conditions and throughout its whole extent. Since two 3D matter-bodies cannot occupy same space simultaneously, universal medium should fill entire space outside smallest basic 3D matter-particles, without scope for empty regions. In this way, universal medium will be in direct contact with every basic 3D matter-particle in universe.

All actions will be directly between basic 3D matter-particles and universal medium. Simultaneous actions between universal medium and many 3D matter-particles can be understood as (apparent) interactions between basic 3D matter-particles. Due to its (practically) static nature, universal medium can provide an absolute reference for all actions and (apparent) interactions in nature.

2.4. Postulation:

All assumptions, used in contemporary physics may be substituted by a single essential and basic assumption, viz; 'Substance is fundamental and matter alone provides substance to all physical entities'. Explanations to every other physical phenomenon can be developed from this single fundamental assumption. As there is only one assumption, there is no possibility of contradiction, falsification or circular logic at any stage of development of theories, on any physical phenomenon. All characteristic properties of diverse matter-bodies and their (apparent) actions or interactions are continuations of (identical) inherent property of infinitesimal foundational matter-particles.

This fundamental assumption is only about positive existence of matter in universe. Matter exists in its purest form. In order to avoid self-dispersal and to exist as an integral object, pure matter has to have certain affinity (similar to attraction) between adjacent points within matter-content of a matter-particle. This is an essential requirement for existence of matter. No other parameters or properties of matter are assumed. Secondary assumptions (wherever required), with respect to matter, are conclusions, logically derived with the help of simple questions, from essential property of matter to exist in space. They are logical extensions of and inferior to fundamental assumption, without contradictions. As existence of matter is an assumption, question 'Why' does not arise. Question 'What' is answered by the assumption itself – matter is substance. Other questions help to derive logical explanations (answers) to all characteristic properties, actions and interactions of matter-bodies in nature.

Whole universe exists because of existence of matter. Therefore, it is unwise to search for cause of its existence. Existence of matter in universe should be taken as a fundamental truth. Presence of matter is the only effect without prior cause. It is the essential substance, by which all physical (material) entities get their objective reality and positive existence in space. These qualities make a real entity conceivable by sensory perception. Smallest bit of matter would have no structure and it would consist of only pure matter. This small bit of unstructured matter may be called a 'quantum of matter' (meaning very small bits of matter).

Quantum of matter with definite properties (and plentiful in nature) is the only postulated particle in this concept. A postulation need not be logical or based on prior reasons. However, production of quanta of matter is explained in next section, as derived

from fundamental assumption. All further developments from basic postulation need to have logical continuity. In this concept also, these simple rules are applicable.

A quantum of matter should be accepted as it is postulated. This is most important, because whole of this concept is based on this, only one type of postulated foundational matter-particles. In contemporary physics, we use many postulated particles and assumed properties to describe various phenomena in science. There are too many postulations to give logical explanations on any phenomenon. In this concept, explanations on all phenomena are based only on this one type of postulated particles.

Inquisitive minds about origin of perpetual universe may consider that a single block of matter (without sub-structure), which would fill entire space, could be speculated as the only original entity existed prior to current universe. Unless it had a shape that was in a critical and stable equilibrium, this entity would gradually fragment into infinite number of quanta of matter to create and sustain universe in its current form. Now that universe has acquired its present steady state, it cannot revert to its original form of single body of matter. Mechanism that would operate such conversion can be inferred from following paragraphs.

2.4.1. Structure-less matter:

The more fundamental a matter-particle is, less complicated its structure is. Ultimately, when degree of complication is least, matter-particle should be of pure matter and it will have no sub-structure or constituents, whatsoever. Obviously, compared to other primary or fundamental matter-particles, structure-less matter-particles are of very minute size.

In order to maintain its integrity as a single entity, every point in a structure-less matter-particle has to have certain affinity with all adjoining points. A point, considered here, is a part of matter-content that has negligible measurements in all spatial dimensions, within the structure-less matter-particle in consideration. Affinity (similar to adhesion or cohesion) between nearest points, within pure matter, acts somewhat identical to attraction between sub-particles of a macro body. Since affinity is not a result of sub-structure in matter-content, its magnitude is neither additive nor it has any relation to distance.

Every point, within a structure-less matter-particle, has same magnitude of affinity with every other point within its matter-content. Hence, there are no resultant efforts on a point, surrounded by matter, in any direction. As points on outer perimeter of structure-less matter-particle have no neighboring points on their outer sides, they have identical resultant inward affinity. Due to inward affinity from all points (on outer perimeter of a structure-less matter-particle), outer perimeter of a structure-less matter-particle acts as a container of included pure matter, without being of any special structure. Resultant of

affinity in various directions, on a point of matter on periphery of a structure-less matter-particle is inward along normal to tangent (plane) at the perimeter.

If a structure-less matter-particle is in spherical shape, resultant affinity at every point on its surface are directed towards its centre. All efforts being identical in magnitude, they maintain critical stability of structure-less matter-particle's spherical shape. Change in shape of spherical structure-less matter-particle alters uniformity of its surface curvature. Normal to tangential plane at points on altered surface does not pass through centre of structure-less matter-particle, any more.

Resolving efforts of affinity at peripheral points into three perpendicular components each, components towards major axis of deformed structure-less matter-particle are greater than components towards its minor axes. Matter-content of structure-less matter-particle gradually displaces itself towards structure-less matter-particle's major axis. A structure-less matter-body, in all three spatial dimensions gradually squeezes all its matter-content into a plane (containing its major axis) and thus become a 2D object.

If a structure-less matter-particle is in circular shape, resultant affinity at every point on its perimeter is directed towards its centre. All efforts being identical in magnitude, they maintain critical stability of structure-less matter-particle's circular shape. Change in shape of circular structure-less matter-particle alters uniformity of curvature of its perimeter. Normal to tangent at altered perimeter does not pass through centre of structure-less matter-particle, any more.

Resolving efforts of affinity at peripheral points into two perpendicular components each, components towards major axis of deformed matter-particle is greater than components towards its minor axis. Matter-content of structure-less matter-particle gradually displaces itself towards its major axis. A structure-less matter-body, in two spatial dimensions, gradually squeeze all its matter-content into a straight line (along its major axis) and thus become a 1D object.

In case of structure-less matter-particles in 3D state, above mentioned reversions into 2D and 1D states may take place simultaneously. Reversion to lower spatial dimensional state is a natural process for structure-less matter-particles. This tendency may be prevented by applying appropriate external push-efforts in opposite direction(s) to matter-particle's expansion. Tendency of a 3D structure-less matter-particle to revert into 2D state can be prevented (or reversed) by external push-effort applied all around it in 2D plane of its development. Similarly, reversion of a 2D structure-less matter-particle can be prevented (or reversed) by external push-effort, applied at both ends in its 1D development.

Let us consider a very large (hypothetical) block of structure-less matter in unstable state. As it has no sub-structure, its matter-content tends to squeeze itself into lower

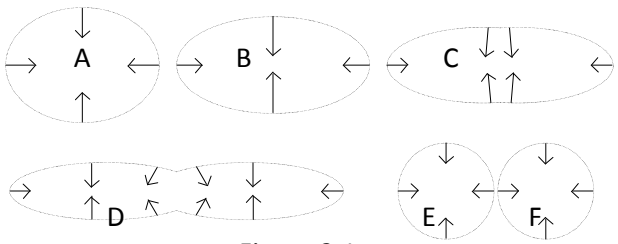

Figure 2.1

spatial dimension. Let us consider this action in a plane, shown in figure 2.1. Arrows in figures represent relative magnitudes and directions of resultant adhesion from matter-content at different peripheral points. 'A' represents matter-content of a large block of structure-less matter in a plane, in its unstable condition. As matter-content spreads in plane, shape of matter-content in the plane assumes elliptical shape. Curvatures at central parts of periphery at upper and lower parts reduce and curvatures at central parts of periphery at right and left ends increase, as shown in 'B'.

Magnitudes of adhesion in vertical directions increase and resultant adhesion in horizontal directions decrease. Matter-content squeezes itself at increasing rate towards major axis of elliptical shape. In figure 'C', small dents form at centers of upper and lower peripheral sectors. Figure 'D' shows increasing dents divert resultant vertical adhesions in opposite directions to lead increasing dent towards complete partition of matter-content to form two separate blocks of structure-less matter as shown in figures 'E' and 'F'. As long as a block of structure-less matter has more matter-content than that can be sustained within surrounding universal medium, it may continue to fragment into smaller and smaller bits of structure-less matter-particles until such tendency is prevented by naturally occurring external means from universal medium.

We are 3D rational beings and we consider matter as real substance only in its 3D state. Hence, a structure-less matter-particle becomes real only in its 3D state. To convert matter into 3D state, certain structuring is essential. Thus, all matter in 3D state is structured and structured matter constitute observable universe. In both 1D and 2D states, matter remains intangible, unobservable and structure-less. In these states, for convenience, (real) matter may be considered as (some sort of) imaginary entity. These imaginary matter constitute rest of universe, which 3D rational beings are unable to observe. Major part of matter in universe that remains unobservable by us may be considered as functional matter (or even as dark matter).

As far as automatic re-shaping of physical objects is concerned, behavior of matter, in its structured state and structure-less state are contrary. These contradictory behaviors are the basis of all physical phenomena in nature, including never ending creation, sustenance and destruction of every object in our universe. These actions take place cyclically to sustain universe in its perpetual state.

2.4.2. States of existence of matter:

Matter provides substance to all real entities. A basic 3D matter-particle contains matter without voids in it. Whole space, occupied by a basic 3D matter-particle, is occupied by matter. (Real) universal medium is also made of matter. Universal medium fills entire space outside basic 3D matter-particles. There are no voids in it either. Hence, entire space outside 3D matter-particles is also filled with matter.

In order to satisfy these requirements, matter-density of a basic 3D matter-particle and matter-density of universal medium, outside basic 3D matter-particles, have to be same. All macro bodies are formed by combination of numerous basic 3D matter-particles. As basic 3D matter-particles and universal medium have same matter-density, entire space (universal medium along with basic 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 matter-density of a basic 3D matter-particle or that of quantum of matter or that of (composite) universal medium. A matter-body (in any spatial dimension) of zero volume and infinite mass (singularity) is impossible to achieve.

Yet, while basic 3D matter-particles and macro bodies formed by basic 3D matter-particles are tangible and can be sensed by 3D rational beings, universal medium and its matter-components should remain intangible and hidden from 3D rational beings. This shows that with respect to rational beings, matter can subsist in different states of existence. In certain states of existence, 3D rational beings can observe matter (in the form of basic 3D matter-particles or 3D matter-bodies) and in certain other states of existence (when it is in the form of universal medium), 3D rational beings can not observe or sense matter.

3D rational beings observe and consider only 3D matter-bodies as real entities. For this, a matter-body has to be tangible and observable in 3D spatial system. To be tangible or observable, a 3D matter-body has to have certain measurements in all three spatial dimensions. If spatial dimensions of 3D matter-body in any or all of three spatial dimensions become too small to be tangible or observable by standards of 3D rational beings, they could no more be considered as (real) 3D entities. However, since these matter-bodies continue to exist in all spatial dimensions, they are indeed real entities. These matter-bodies have their existence in all spatial dimensions. 3D rational beings are not able to observe or sense them, only because their measurements in one or more spatial dimension(s) is/are intangible by 3D standards.

If spatial dimensional measurement of a 3D matter-body becomes intangible in any one of three spatial dimensions, it may be considered as a 2D matter-body. If dimensional measurements of a 3D matter-body become intangible in any two of three spatial dimensions, it may be considered as a 1D matter-body. Therefore, it is possible for matter to remain real and be able to exist in 1D, 2D or 3D states. In its 1D and 2D states, a

matter-body is hidden from 3D rational beings. Although these matter-bodies are real, as they are hidden, 3D rational beings may consider them functional entities. Only in its 3D state, a matter-body becomes real to and observable by 3D rational beings. However, this does not prevent matter in any spatial dimension to be a real entity.

If universal medium is formed by matter in its hidden states, universal medium and its actions remain hidden from us and at the same time, we are able to observe results of all actions by universal medium on 3D matter-particles. Therefore, all actions, currently attributed to matter-bodies have their origin in universal medium.

Matter is the same, in whichever form it appears. Matter that forms observable 3D matter and hidden universal medium should have a common foundational existence. As this type of existence is unknown, we should postulate a 'most basic or foundational matter-particle' that can remain hidden or can be observed under different conditions. Postulation of 'foundational matter-particle' has not contravened basic assumption given earlier ('Substance is fundamental and matter alone provides substance to all physical entities'). This postulated foundational matter-particle is a real entity with positive existence in space. It has objective reality in space. It should be able to constitute hidden universal medium as well as observable basic 3D matter-particles.

2.4.3. Postulated matter-particle:

Logically, every entity has to be created or developed from its predecessor-particles, until the chain reaches most foundational of all particles. Hence, it is essential that all matter-bodies, including universal medium, are created or developed from the most foundational matter-particles − the 'quanta of matter'. As extent of universe is infinite, there should be unlimited quantity of quanta of matter in nature.

Since a quantum of matter (in its natural state) is a hidden object, none of its parameters is directly accessible. It should be postulated as an 'ideal matter-particle', while keeping within the scope of fundamental assumption, for a unified physical theory. Its structure, content and properties are postulated (without contravening basic assumption) to suit development of a logical unified physical theory that explain all physical phenomena under same physical laws, applicable under all conditions.

In order to avoid circular logic and conflicting behaviour, there are no other postulated matter-particles in this concept. There can be no effects preceding or without causes, imaginary particles, mysterious properties or actions at a distance through empty space. All actions and effects have to originate from postulated quanta of matter and they should have preceding causes. All causes should result in following effects.

Basic postulation of this concept pre-supposes that (1). Matter is the only substance that can provide positive existence and objective reality to all real entities in space. Hence, all real entities are made of matter. (2). Space is the region, presupposed by

rational beings, whenever real entities (matter-bodies) are envisaged. (3). There is sufficient quantity of matter to fill entire space, without voids. None of these pre-suppositions contradicts original assumption about existence of matter.

'Quantum of matter' is the only one type of matter-particle, postulated in this concept. All properties and parameters, related to quanta of matter, associated with postulation may be tabulated as:

1). Matter provides substance to all real entities in universe.
2). Whole matter in nature exists in the form of quanta of matter.
3). Quanta of matter are the only type of foundational matter-particles.
4). There are infinite numbers of quanta of matter in nature, sufficient to fill entire space, without voids.
5). Matter-content, within a quantum of matter, has adhesive (cohesive) nature within itself.
6). A quantum of matter preserves its individuality under all conditions. Other than in certain extreme cases, its matter-content can neither be divided into parts nor supplemented with matter-contents of others.
7). A quantum of matter simultaneously exists in all spatial dimensions, even if its measurement in any spatial dimension is intangible.

2.4.4. Quantum of matter:

A 'quantum of matter' is postulated as the smallest 'real matter-particle'. Diverse matter-bodies, different properties and all other physical phenomena develop from and due to quanta of matter, which fill entire universe. Quantum of matter is a very small object of pure matter, in its unstructured state. Matter-content within a quantum of matter tends to stick together – a quality similar to 'self-adhesion' (or 'self-cohesion'), which helps affinity (somewhat similar to attraction or tendency to stay attached) between nearest points within matter-content of a quantum of matter and between matter-contents of quanta of matter, which are in direct physical contact. Quantum of matter has definite structure, properties and ability to act, all arising from its inherent property of self-adhesion of its unstructured matter-content.

A quantum of matter, in its natural free state, is a 1D object. In its free state, it has only length as its tangible spatial measurement. Due to self-adhesion of its matter-content, it is free quantum of matter's inherent nature to grow and exist only in one spatial dimension. Length of a quantum of matter may be reduced by external pressure from ends to grow its body in width and thus developing into 2D space until its body-shape becomes a perfect circle in a plane, to make it a 2D quantum of matter. Further, if identical inward external pressure is applied all around periphery of a 2D quantum of matter (in its 2D state), its matter-body is compelled to grow into third spatial dimension, while reducing measurements in other two spatial dimensions.

Area of a 2D quantum of matter may be reduced by compressing its matter-content to grow it in thickness and thus developing its existence into 3D space. If sufficient external pressure is available, growth into third spatial dimension (in thickness) continues until quantum of matter becomes a perfect sphere. As soon as a quantum of matter grows in to its third spatial dimension, it becomes a 3D matter-body, with objective existence in 3D space. This is the stage of creation of 3D matter, in nature. We, as 3D beings, can associate only with 3D matter. Unfortunately, length of a quantum of matter, even in its 1D state, is so small that none of our 3D measurements is able to measure it, directly.

Since matter is its substance, irrespective of its negligible body-measurement(s) in any spatial dimension(s), a quantum of matter has objective (real) existence in 3D space. On same line of reasoning, it may be imagined that if additional inward pressure can be applied all around volumetric periphery of a 3D quantum of matter, it may reduce its volume and grow into a fourth spatial dimension, if any, about which we know nothing.

Conversely, reduction in external pressure on a quantum of matter in higher spatial dimensional status can gradually lower its spatial dimensional status, untill it becomes a 1D quantum of matter of (theoretically) unlimited length. This phenomenon causes properties of ‘self-constriction’ and ‘self-elongation’ of quanta of matter. By these properties, matter-content of a quantum of matter has a tendency to squeeze itself into and spread its matter-content in lower spatial dimensional system. 3D quantum of matter has inherent property to convert itself into 2D quantum of matter by reducing its thickness (and increasing its width) or into 1D quantum of matter by reducing its thickness and width (and increasing its length). 2D quantum of matter has inherent property to convert itself into 1D quantum of matter by reducing its width (and increasing its length).

A quantum of matter further has a measure of its matter-content. Matter-content is not a spatial measurement. As we have no standard reference to measure quantity of matter, matter-content of a quantum of matter is not directly tangible. Matter-content of a quantum of matter is continuous and incompressible. [This is only a general statement. Minute relative motions, transmissions of effort or deformations within its spatial dimensions, which can be neglected for practical purposes, may be tolerated within a quantum of matter’s matter-content, in association with changes in spatial dimensions]. It is sufficient to understand that while a truly rigid body cannot transmit effort through it, quanta of matter can transmit effort by changes in their spatial existence.

Quantum of matter is an independent matter-body. Quantum of matter is the most foundational object with only one simple characteristic property of self-adhesion. No other regular entity can exist to control or regulate physical parameters of this most foundational entity. Generally, it maintains its individuality under all conditions. Accidents

may happen at random in universe, where amalgamation of matter-contents from different quanta of matter may take place or matter-content of a quantum of matter may split into two smaller quanta of matter. As there is no mechanism to regulate uniformity of matter-contents in quanta of matter, magnitudes of matter-contents in different quanta of matter may vary from one to another. Dissimilarity in magnitudes of matter-contents of quanta of matter is an essential factor for creation of 3D matter-world. However, universal medium is formed by quanta of matter of (to some extent) equal matter-contents.

Density of matter (everywhere in our universe) is the same irrespective of nature of its existence, in whichever form. Matter is neither compressible nor expandable. Due to differences in their matter-contents, quanta of matter may have different measurements, in different spatial dimensions. Under different environments, they may exist in different spatial-dimensional status. A quantum of matter can express its individuality only in spatial dimension(s) of its existence.

No two real entities can simultaneously exist in same volumetric space. Therefore, no two quanta of matter can exist in same space in same spatial dimension(s). Two 3D quanta of matter cannot simultaneously exist in same volumetric space. Two 2D quanta of matter cannot simultaneously exist in same space in a plane. Two 1D quanta of matter cannot simultaneously exist in same space in a straight line. However, quanta of matter in different spatial dimensions but passing through same point, in space, are able to coexist at the point. (See section 2.5.3).

A 3D quantum of matter exists in all three spatial dimensions. Hence, no other quanta of matter can invade space occupied by it, even if they are 1D or 2D quanta of matter. A 2D quantum of matter exists only in two spatial dimensions. Hence, 2D or 1D quanta of matter existing in third spatial dimension can extend through the 2D quantum of matter, without breaking its continuity. A 1D quantum of matter exists only in one spatial dimension. Hence, 2D or 1D quanta of matter existing in second and third spatial dimensions can extend through the 1D quantum of matter, without breaking its continuity.

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. It may be qualified as a 2D object. Similarly, when its body-measurements in any two spatial dimensions are too small to be intelligibly measured by 3D beings, we must say that the quantum of matter exists only in one spatial dimension. It may be qualified as a 1D object. General actions on or by quanta of matter are limited to spatial dimensions of their existence. However, very minute and intangible

actions, limited to their (apparently) non-existent spatial dimensions, are also logically possible.

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

Matter-contents of quanta of matter have no substructures. They have pure structure-less matter as their contents. Their matter-contents are homogeneous and isotropic. Two 1D quanta of matter occupying same point in space, essentially, have to be at an angle to each other. Their negligible widths (as and when they are developed) have to be in different planes. Since they are 1D objects, they cannot extend into each other's spatial-dimension so as to create discontinuity for other's existence. Since two quanta of matter are in different planes and crossing each other at a point in space (they are in different spatial dimensions), they do not intrude into each other's spatial-dimensions. Due to lack of substructures, matter-content at the point of their crossing is able to be part of both quanta of matter, simultaneously.

Similarly, a quantum of matter can also co-exist with a 2D matter-body (its thickness is zero) in different planes. However, as all spatial-dimensions are occupied by a 3D matter-body, a quantum of matter is unable to coexist with a 3D quantum of matter in space. It has to remain outside 3D matter-body.

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

Interactions are possible only between quanta of matter, existing in same spatial dimension(s) and in direct contact with each other. Property of self-adhesion in matter-

contents, across point of contact between two quanta of matter, tends to encourage their matter-contents to merge and form a single quantum of matter, with greater matter-content. Due to various reasons, given further in this text, points of contact between two quanta of matter are never steady. Therefore, magnitude of adhesion, between matter-contents of two separate quanta of matter (which are in direct physical contact) through their (unsteady) point of contact is less than magnitude of adhesion between nearest points within matter-content of individual quantum of matter. This difference in magnitudes of (average) adhesion prevents merger of matter-contents from different quanta of matter, while preserving integrity of matter-content of individual quantum of matter.

Even when two quanta of matter in different spatial dimensions co-exist at a point in space, their point of contact continuously change (dither about a point). Incessant changes in location of 'point of contact' reduces magnitude of (average) adhesion between matter-contents of quanta of matter in contact to less than magnitude of adhesion within matter-content of individual quantum of matter and thus prevent merger of their matter-contents. Same phenomenon prevents matter-contents of intersecting quanta of matter (in different spatial dimensions) from merging their matter-contents.

2.4.5. Properties of quantum of matter:

'Quantum of matter', described above has vague resemblance to 'strings' in 'string theories'. It should be noted that quanta of matter are distinctly separate from 'strings'. Only resemblance is that both of them are postulated foundational entities. A 'string' is assumed as a vibrating particle of energy in space, which forms various matter-particles in accordance with frequency of its vibrations. What is vibrating, mechanism of vibration or where does it vibrate are left to our imagination. Energy and space, which are essential parts related to 'strings', are left undefined. Whereas, postulated quantum of matter is derived as a real entity from foundational assumption of this alternative concept. Quantum of matter is a fully defined real entity.

Unlike 'strings', quantum of matter is a minute particle of structure-less matter with positive existence in space and which may be transformed to have tangible existence in any or more dimensional space systems by (or lack of) external efforts. Other than its inherent property to elongate in its own spatial dimension and tendency to form one-dimensional chain with similar entities in contact, it is inert and incapable of any other motion or interaction on its own. A quantum of matter has definite properties, quite different from those of assumed 'strings'.

Due to adhesive property, between nearest points in its structure-less matter, matter-content in a quantum of matter has a tendency to coagulate together. Ability to maintain individuality and independence of a quantum of matter by coagulation of its matter-content may be called property of 'self-adhesion'. Unlike attraction between different 3D

matter-particles in a macro body, adhesion (affinity) within matter-content of a quantum of matter exists only between nearest points in its structure-less matter. Hence, magnitudes of affinity between any two points within a quantum of matter or between matter-contents of two quanta of matter in direct contact are of constant value. Property of self-adhesion gives a quantum of matter, two fundamental characters, viz. self-constriction and self-elongation.

By property of self-adhesion, structure-less matter-content of a quantum of matter continuously tries to coagulate together. Self-adhesion or affinity is a property like 'attraction' between various points within a block of structure-less matter. Self-adhesive nature of matter-content of a quantum of matter tends to gather its matter-content towards a central point. Matter-content of one quantum of matter has same magnitude of affinity towards matter-content of any other quantum of matter, which 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. This tendency, of two quanta of matter in contact, to merge produces affinity between them (only when they are in direct contact and in same spatial dimensional system). If quanta of matter are at angle to each other, in different planes, they can co-exist without mutual interference.

Property of self-constriction compels a quantum of matter to restrict its existence in any spatial dimension to minimum. Self-elongation compels a quantum of matter to grow (revert) into lower spatial dimension from its present spatial state, until it reaches 1D spatial state, by lengthening-out as far as possible. These properties squeeze matter-content of a quantum of matter (in case of 3D quantum of matter) towards its central plane to reduce its thickness or (in case of 2D quantum of matter) to lengthen-out along its major axis in a plane to reduce its width. These are inherent properties of quanta of matter. All these properties are derived from nature of structure-less matter, which forms quanta of matter. These properties do not contradict initial assumption in this concept.

Each quantum of matter is a separate entity that always keeps its single-body identity. A separate 'boundary' or a 'skin' around a quantum of matter will again require substructures within its matter-content, which are not envisaged. Cohesion within matter-content of quantum of matter helps to maintain individuality and separation between quanta of matter, which are in direct contact. Consider a point on the periphery of a quantum of matter. Nearest points within matter-content of same quantum of matter are nearer than nearest points across peripheries between two quanta of matter (which are in direct contact). This would make a difference in magnitudes of cohesion at the point on periphery of one quantum of matter, towards its own matter-content or towards matter-content of another quantum of matter, which is in direct contact.

Moreover, (as explained later in this text) point of direct contact between two adjoining quanta of matter is never steady. Constant and continuous changes in locations of direct contact between two quanta of matter, drastically reduces average magnitude of adhesion between their matter-contents, through their point of contact. Slight movements, taking place within latticework-structures of universal medium (made by quanta of matter) due to their continuous stabilization, constantly shift point of contact between two quanta of matter. Thus, even without help of a specialised border or skin, a quantum of matter can maintain individuality and independence of its matter-content. Other than by accidents, matter-content of a quantum of matter can neither be fragmented nor be merged with matter-content of others.

Elongation in first spatial dimension reduces a quantum of matter's existence in all higher spatial dimensional systems to negligibly small. As and when external actions reduce size of a quantum of matter in its present spatial dimension, it expands into higher spatial dimensions. On compressing a 1D quantum along its axis, against property of self-elongation of its structure-less matter-content, its length reduces with corresponding growth of width into 2D spatial system, against property of self-constriction.

A free quantum of matter, being free in space, where it can lengthen-out to its limit is only a hypothetical consideration. As far as a single quantum of matter is concerned, unlimited 'free' or 'empty' spaces do not exist. [Distance is a measure of separation between matter-particles/bodies in space. A single quantum has no other matter-body as a reference].

By postulating quantum of matter, matter-content (and not energy or other related parameters) of a composite body (a union of more than one quantum of matter) is quantified in terms of their numbers. Only addition or subtraction of integral numbers of quanta of matter can change total matter-content of a 3D matter-particle. Due to possible variations in magnitudes of their matter-contents, between quanta of matter, magnitude of matter-content of a 3D matter-body may not be strictly proportional to number of quanta of matter, it contains.

Properties of a quantum of matter are derived from structure-less state of its matter-content. Properties of the quanta of matter, postulated as the most foundational entity (structure-less matter-body) and on which this concept is based, may be tabulated as follows:

1. Quanta of matter are indivisible foundational (structure-less) matter-particles. They can neither be created nor destroyed. They exist perpetually.
2. A quantum of matter, in its 1D state, has a body and two ends. It keeps its single-body identity under all conditions. Matter-content of a quantum of matter coagulates to be single body. This provides a quantum of matter with its self-adhesive nature.

3. When free, a quantum of matter squeezes all its matter-content into its 1D spatial system. Its body extends in its own spatial dimension, so that its measurements in all other spatial dimensions are negligible (reduced to zero). 'Self-constriction' is an inherent nature of quanta of matter.
4. External compression, from ends of a 1D quantum of matter, may reduce its length and compel its matter-content to grow into 2D spatial system and external compression, all around perimeter of a 2D quantum of matter, may reduce its area and compel its matter-content to grow into 3D spatial system (and so on).
5. Two quanta of matter, in contact, apparently 'attract' each other and they tend to line up in same 1D spatial system 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 (mesh-like) latticework-structures to fill entire space (outside basic 3D matter-particles) in all directions. A single quantum of matter has no stable, independent existence in 3D spatial system.
7. Although quanta of matter are real entities, spatial measurements 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 need not be equal. Quanta of matter, which have nearly equal matter-contents, form latticework-structures of universal medium and others create disturbances in universal medium.

All properties (given above) are parts of original postulation of quanta of matter. They are derived from basic assumption of this concept. Fundamental character of self-adhesion of structure-less matter-content, in a quantum of matter, produces these properties. Every inference, hereafter, in this text is based only on these properties of quanta of matter.

2.5. Nature of quanta of matter:

In order to bestow above properties to quanta of matter, nature and interactions by quanta of matter are envisaged as follows: For explanations in this section, we will assume a quantum of matter is greatly enlarged in physical size, so that it has tangible or visible existence in all three spatial dimensions. Quanta of matter are structure-less matter-bodies. Matter is a substance with positive existence in space. It occupies space. Since our spatial system is three-dimensional, all real matter-bodies have their existence in all three spatial dimensions, however small their measurement in any spatial dimension may be.

Matter-content of quantum of matter is plastic in nature and it constitutes single object. Depending on external efforts on it, it may change its physical shape. However, it

is impossible to increase or reduce its matter-density (by compression or de-compression). Irrespective of relative displacements (due to changes in shape) of matter-content within, a quantum of matter remains a single body of structure-less matter. Each quantum of matter, depending on external pressure on it, may exist in any one or more of spatial dimensions.

Since a quantum of matter is a single body, its matter-content spreads evenly within its border. Matter-content of a quantum of matter has a constant matter-density. Matter-density of a quantum of matter is the highest matter-density any matter-body may have (in any spatial dimension) and it is invariable. Matter-content of a quantum of matter cannot be compressed. Compression on a quantum of matter changes its shape by ingress of its matter-content into higher spatial dimensional space rather than change its matter-density.

Depending on external pressure on its perimeter (in any spatial dimension), a quantum of matter may assume various geometrical shapes. [Affinity within matter-content of a quantum of matter is not 'attraction' in true sense, as we understand in the cases of 3D macro bodies. Apparent attraction may develop indirectly and may appear to act between different 3D macro bodies or between their constituent basic 3D matter-particles]. A quantum of matter is a single matter-body and hence, cannot have 'attraction' within itself. However, for current explanations, we may use the term 'attraction' to describe affinity of matter-content within a quantum of matter that keeps its integrity as a single-body entity. Effort of 'attraction', within matter-content of a quantum of matter, is not transmitted and there is no external agency involved with its actions. 'Attraction' within matter-content of a quantum of matter is between nearest points within or to matter-content of another quantum of matter that is in direct contact.

2.5.1. Actions within quantum of matter:

In our 3D world, all (apparent) attractions are results of push actions on basic 3D matter-particles. No action can take place through empty space. No entity attracts another across empty space. In a macro body, all its basic 3D matter-particles are continuously under motion and they do not touch each other. There are definite gaps between basic 3D matter-particles of a macro body. Indirect contact between moving basic 3D matter-particles is trough universal medium, between them. Basic 3D matter-particles are pushed towards each other by an external agency to produce appearance of 'attraction' between them or between their mother-macro bodies.

Because of intermediate agency, interposed between basic 3D matter-particles, each of basic 3D matter-particles apparently interacts with all others, in and about a macro body. Magnitude of apparent attraction increases as number of basic 3D matter-particles, between the points (in macro body), increases and magnitude of apparent attraction suffers certain deduction in its strength as distance between them increases. Thus,

distance between 3D matter-particles or macro bodies becomes a factor to determine magnitude of apparent attraction between macro bodies.

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

Integrity of matter-content:

Consider three adjacent points A, B and C, in a straight line at equal intervals, within matter-content of a quantum of matter. Point A is on periphery of quantum of matter. Affinity within matter-content produces apparent attraction between these points. Apparent attraction exists between points; A to B, B to A, B to C, C to B, and C to the next point in straight line. Magnitudes of all apparent attractions are equal. Apparent attractions on point C and point B in opposite directions neutralize. Since apparent attraction between A to B has no opposition to neutralize. It alone is left in the system as resultant apparent attraction. Similarly, all points on periphery of a quantum of matter have inward apparent attraction. Resultant inward efforts provide, periphery of a quantum of matter, character of a container of its matter-content, even without a special or different structure.

A very small part of a line (curved or not) can be considered as a straight line. Since a point is much smaller than a small part of line, a point on part of periphery of a quantum of matter is on a straight line, despite curvature of periphery. Consider apparent attraction, emanating from a peripheral point on a quantum of matter towards other points in matter-content, in different directions. Each of these apparent attractions may be resolved into two components, one parallel and other perpendicular to periphery. Since, components parallel to the periphery are in opposite directions and equal in magnitudes, they neutralize each other. Components of apparent attraction, perpendicular to periphery (all around) add up to form resultant radial apparent attraction towards centre of matter-content. Thus, coagulating tendency of matter-content produces an inward apparent attraction on every point on periphery of a free quantum of matter, in perpendicular direction to periphery. Apparent attraction is effective only between adjacent points within its matter-content.

In figure 2.2, let part of circle in dotted line indicate a 2D quantum of matter in its critical equilibrium in 2D spatial system. Coagulating effort, AB, from point A on its periphery acts towards centre of the circle, O. Efforts on all points on its periphery may be resolved into two parts, each. One part of apparent attraction acts towards coordinate axis, XX, and other part acts towards coordinate axis, YY. Since 2D quantum of matter is in circular shape, components of apparent attractions from all points on its periphery, balance each other and there is no resultant displacement of matter-content within 2D quantum of matter.

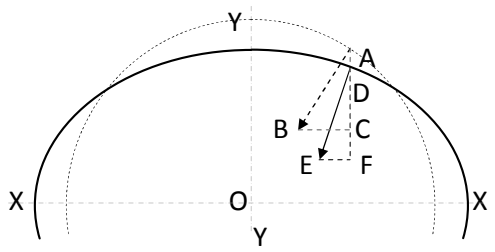

Figure 2.2

Let 2D quantum of matter deform to elliptical shape as shown by thin line. Consider coagulating effort, at point D on its periphery. Due to distortion of quantum of matter's matter-content, direction of apparent attraction (being perpendicular to the periphery) is no more towards centre of 2D quantum of matter. Direction of resultant apparent attraction at point D is along DE, perpendicular to periphery. Magnitude of 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 attractions, directed towards axis XX, are greater than magnitudes of components of apparent attraction, directed towards axis YY. As a result, 2D quantum of matter acquires a tendency to shrink towards axis XX and expand away from axis YY. 2D quantum of matter contracts towards XX axis and elongate along XX axis at increasingly greater rate until quantum of matter reaches its 1D spatial state with highest possible length and negligible measurements in other spatial dimensions. In this manner, a free quantum of matter, which may be in its critical equilibrium in 2D spatial status, reverts to its 1D spatial state at slightest provocation.

If a circular (spherical) macro body (which we normally encounter in nature) is considered, action of inward apparent attraction is governed by magnitudes of efforts in different directions. Magnitudes of apparent attraction are proportional to number of basic 3D matter-particles (distance) in a line. As macro body is distorted to elliptical shape, number of matter-particles along its major axis increase. Correspondingly, magnitude of apparent attraction in this direction is also increased. Actions of apparent attractions in all directions tend to restore macro body's circular (or spherical) shape.

Actions of mutual apparent attractions in a macro body and actions of apparent attractions within matter-content of a quantum of matter are different. In free space, a

macro body strives to become spherical and a quantum of matter strives to become straight line, in shape.

Viscosity of a macro body is the result of its substructures and interactions between its constituents. Number of 3D matter-particles between two points is proportional to distance between them. As a result of macro body's viscosity, total internal apparent attraction between 3D matter-particles (on opposite sides on its periphery) increases as distance between them increases. Consequently, a free macro body in free space, assumes spherical shape. In a macro body of even consistency, inward (mutual) attractions on various basic 3D matter-particles reach balanced state, only when macro body becomes spherical in shape.

Since structure-less matter has no substructure; property of viscosity is not applicable to matter-content within a quantum of matter. However, there is a strong attachment between nearest points within matter-content. This attachment (affinity), instead of raising viscosity of matter-content, helps towards self-constriction, by which a quantum of matter tends to reduce its existence in higher spatial dimensions (by elongating in single spatial dimension). Magnitude of cohesion between two points within matter-content of a quantum of matter is of constant value. If we consider cohesion within matter-content of a quantum of matter as its viscosity, its magnitude should be very high and constant, under all conditions.

Change in dimensional status:

Magnitude of effort due to self-constriction is inversely proportional and magnitude of effort due to self-elongation is directly proportional to curvature of periphery of 2D or 3D quantum of matter. In the process of conversion to higher spatial dimension, depending on points of external pressure, 2D or 3D quantum of matter may assume different geometrical shapes. Changes in its geometrical shape are result of quantum of matter having contacts with different external quanta of matter.

A 2D or 3D quantum of matter, having different geometrical shape, has more number of ends or corners than 2D quantum of matter in (hypothetical) circular shape or a 3D quantum of matter in spherical shape. Each end has property of self-elongation, with magnitude of effort, proportional to its curvature. More number of ends (projections from main body) in a 2D or 3D quantum of matter increases its total self-elongating action. Increased curvature of an end-point also increases effort of self-elongation. Corner points, of geometrical shapes with straight sides, have very high curvature at every corner. This also increases magnitudes of self-elongation in a quantum of matter.

Reversion of 3D quantum of matter into 2D spatial 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 3D spatial state to 2D spatial state or from 2D spatial state to 1D spatial state. Perpendicular plane to the plane, where distortion in 3D quantum of matter is initiated, will become plane of converted-quantum of matter in its 2D spatial state.

Similarly, the line perpendicular to diameter of 2D quantum of matter, where its distortion is initiated, will become axis of converted-quantum of matter in 1D spatial state. Action of external effort is required to convert a quantum of matter to higher spatial dimensional states but removal of external efforts automatically revert a higher spatial dimensional quantum of matter to its lower spatial dimensional status.

As external pressure on a hypothetical, free 3D quantum of matter is lowered, pressure difference is felt 'first' in any one of the planes passing through its matter-content. Let us call this plane as 'reference plane'. Reduction in external pressure initiates reversion of 3D quantum of matter into 2D status. Since there is a difference in external pressure in reference plane, with respect to other planes, matter-content of 3D quantum of matter squeezes itself, to spread out in this plane of lower external pressure. Sphere of matter-content bulges outward in reference plane. Perimeters of sphere, in all other planes, become flatter. Flatter perimeter segments have lower curvature and reduce magnitude of required pressure difference between external and internal pressures for stability. As external pressure on 3D quantum of matter is gradually reduced, 3D quantum of matter continues to grow in reference plane and shrink in all other planes, until the quantum of matter becomes a circular disc of negligible thickness in reference plane. Now the quantum of matter is a 2D object.

A free, hypothetical quantum of matter in 2D status, has only two tangible spatial dimensions, length and breadth. A fully developed hypothetical 2D quantum of matter has a circular area in a plane and it is under considerable external pressure all around its periphery. As external pressure is reduced, difference between external and internal pressures is felt 'first' in the direction of any one straight line in same plane and passing through disc-shaped matter-content of 2D quantum of matter. We will call this line as a 'reference line'.

External pressure all around periphery of 2D quantum of matter squeezes its matter-content to bulge outwards along reference line. Circular disc of matter-content becomes oblong, as shown in figure 2.2. Part of perimeter of 2D quantum of matter, at 90° to reference line, becomes flatter. Flatter perimeter has lower curvature and hence requires lower difference between external and internal pressures for balanced state. As external pressure is reduced gradually, matter-content of 2D quantum of matter gathers towards and extends along reference line. This further reduces curvature of flatter segment of its perimeter. Reduction in curvature of perimeter segment, in turn, compels perimeter of 2D quantum of matter to move inward and reduce its curvature, further. Diameter of 2D

quantum of matter at 90° to reference line continues to shrink. This process will continue until external pressure is removed completely from the quanta of matter.

In this state, quantum of matter exists only in one spatial dimension along the reference line. This is single spatial dimensional system for quantum of matter. Measurements in all other spatial dimensions have reduced to negligible values. If unrestricted, a quantum of matter will continue to grow in first spatial dimension up to maximum limit.

If external pressure on a hypothetical 3D quantum of matter is reduced, only along a straight line passing through its matter-content, its reversion to second and first spatial dimensional systems starts simultaneously. If reduction in external pressure is halted at any stage, reversion of quantum of matter from its 3D spatial state also ends. Thereafter, 3D quantum of matter maintains its present spatial dimensional status until external pressure varies again.

For a quantum of matter, there is no preferred reference plane for reversion to second spatial dimension system or preferred reference line for reversion to single spatial dimension system. Plane or line that experiences pressure difference 'first' becomes reference plane or line. Thus, a 3D quantum of matter may revert to a 2D quantum of matter in any plane passing through it or to a 1D quantum of matter in any straight line passing through it. A 2D quantum of matter may revert to a 1D quantum of matter of any straight line in its plane and passing through it. Once reversion process has started, reference line or plane does not change. All further actions of quantum of matter are restricted to this line or plane, as the case may be.

A 2D quantum of matter, in any shape, not in contact with quanta of matter in its plane on all sides, cannot have uniform external pressure. Therefore, such 2D quantum of matter always tends to revert to its 1D state. Its length is always sufficient to provide the required difference in internal pressure, in conjunction with external pressure acting from its ends, to maintain required difference between internal and external pressures.

In case of reversion of a quantum of matter, which is already a part of a higher spatial dimensional matter-particle, into lower spatial dimensional systems, external pressure cannot be reduced gradually. As soon as external pressure is reduced sufficiently to commence reversion, contacts of quantum of matter with its neighbors in corresponding spatial dimensional system is removed or reduced and external pressure is no more applied all around its periphery. This produces a rapid reversion of quantum of matter into lower spatial dimensional system. Reversion may halt only when contacts with its neighbors can be re-established, to apply corresponding external pressures.

Conversions of quantum of matter into higher spatial dimensions (2D and 3D spatial states) are reverse process to its reversion, as explained above. In the case of conversion

into higher spatial dimensions, first plane that contains quantum of matter and feels increase in external pressure becomes 'reference plane' for creation of 2D quantum of matter. First volumetric space containing quantum of matter and feels an increase in external pressure becomes its 'reference volumetric space' for creation of 3D quantum of matter.

External effort or pressure, on a quantum of matter, may be gradually increased to facilitate its gradual conversion into higher spatial dimensional systems. If change (in effort or pressure) is halted at any stage, spatial state of quantum of matter is maintained in that steady condition.

In nature, no quanta of matter are maintained purely in 1D spatial status. They are usually held in higher spatial dimensional states. That is, since entire space is filled with formations by quanta of matter, all of them are under some or other external pressures. Depending on magnitude of external pressure, a quantum of matter changes its spatial dimensional state. Quanta of matter with negligible width and touching each other have a tendency to line up along a straight line with their ends in contact (as explained below). Hence, external pressure on them can be applied (initially) only from their ends. As external pressure increases from ends, a quantum of matter increases its width and reduces its length. This process can continue until the quantum of matter becomes a fully developed 2D quantum of matter in circular shape.

In order to continue conversion of 2D quantum of matter towards higher spatial dimensional states, it is now necessary to provide external pressure from all around its periphery in its plane. If this is not provided and original external pressure from its ends (in 1D spatial state) continues to increase, matter-content of 2D quantum of matter will start to grow in same plane in a direction 90° to direction of application of external pressures. As soon as this happens, curvatures at points of application of external pressures decrease. Now external pressures are acting on 2D quantum of matter in conjunction with its own self-constriction to grow into 1D spatial state, perpendicular to line of action of external pressures. Irrespective of the fact that, external pressures are effective or not, 2D quantum of matter continues to grow in its new 1D spatial system under its own property of self-elongation.

Similar phenomenon may take place during conversion of a quantum of matter from its 2D spatial status to 3D spatial status, also. External pressures, all around circumference of 2D quantum of matter, may convert it into its 3D spatial state. As external pressure increases, quantum of matter gradually develops into its 3D spatial status. Under even pressure from all around its periphery, 3D quantum of matter becomes a spherical object. From this point onwards, it needs external pressure from all around its volumetric space, for further conversion into higher dimensional spatial system, if any. If this is not provided

and external pressure in original plane continues to increase, the quantum of matter will revert into 2D spatial state in a plane perpendicular to its original plane.

Due to very high probability of 2D or 3D quantum of matter developing distortions in its shape, a free quantum of matter always tends to exist in its own single-dimensional space system. Since entire space is filled with latticework-structures of universal medium (as explained below), a quantum of matter cannot find enough space to elongate fully in its own single-dimensional spatial system. Therefore, in nature, all quanta of matter exist in higher dimensional spatial systems, majority of them in 2D spatial status.

A quantum of matter, in its 3D state, exists in all three spatial dimensions. It has its measurements in length, breadth and thickness. Let us consider a quantum of matter in spherical shape and under heavy pressure from all around. This is a critically stable condition. [A spherical 3D quantum of matter is a hypothetical consideration. A quantum of matter can exist in its 3D status only within a 3D matter-particle. In such circumstances, a quantum of matter is shaped as a cube or other geometrical shape according to its position with respect to neighbors, rather than a sphere. There are no other means to apply uniform external pressure on a 3D quantum of matter]. In this state, external pressure on it is just sufficient to balance its constant internal pressure and to maintain its 3D spatial status. Should external pressure exceed this limit, there is a theoretical possibility that the 3D quantum of matter will start to grow into unknown and undefined fourth dimensional spatial system. If external pressure is lowered, it will start its reversion into second dimensional system.

As soon as external pressure, at certain points on perimeter of a quantum of matter in higher dimensional spatial state, is reduced or removed, its matter-content elongates in this direction due to external pressure from other directions. Extension of its matter-content, in the direction of lower pressure, shrinks extent of its matter-content in other directions. As a 2D circular quantum of matter becomes elliptical or oval, its curvature is different at different peripheral points. Different curvature needs different pressure difference between either sides of curvature for a balance.

Newly extended part of quantum of matter (ends) has greater curvature at its extremities. These parts require greater pressure difference to reach stable states, which its matter-content (being of constant matter-density) cannot provide. Resultant efforts continue to extend matter-content of quantum of matter in the direction of perimeter segment with greater curvature. Diminishing curvatures at other parts of perimeter produce greater constricting efforts, perpendicular to direction of extension. This helps movement of matter-content towards perimeter segment with greater curvature from area of perimeter segments with lower curvatures.

At the same time, inward movement of quantum of matter's periphery in one direction produces corresponding outward movement of its periphery in another

direction (perpendicular to inward movement). Inward movement of periphery of quantum of matter lowers magnitude of pressure difference required for balanced state. Reduction in diameter in this direction reduces length of matter-content within quantum of matter, across newly developed axis with corresponding reduction in curvature of perimeter.

Theoretically, matter-content of a quantum of matter may be said to have three critical equilibrium states, one in each of spatial dimensional systems. Practically, it cannot remain in any one of these states. Even a very small distortion or external effort on it, disturbs its equilibrium and quantum of matter is compelled to change its spatial state towards lower spatial dimensional system.

Under external compression from its ends, a free quantum of matter may grow, first into 2D plane by developing in width. If unrestricted, this growth continues under continued compression, until the quantum of matter has attained shape of a perfect circle. Only when growth of quantum of matter in this plane is restricted or when its growth has reached its limit of a perfect circle and identical compression continues to increase from all around its periphery, the quantum of matter may grow into third spatial dimension. That is, it will develop in thickness.

It is at this stage, when quantum of matter has grown into 3D spatial system, that the quantum of matter has become a real entity or real matter (for us, the 3D 'beings'). Its measurements in all three dimensional spatial systems are tangible. On further compressing the quantum of matter, similar growth into higher-dimensional spatial systems also may be envisaged for speculative purposes. On release of compression, quantum of matter reverts to its original nature in reverse order.

Displacement in space:

Let us consider a quantum of matter, A, as shown in figure 2.3, in its 2D spatial state. Two hypothetical (equal) inward efforts, as shown by thick arrows, applied at ends of major axis of quantum of matter keep its elliptical shape in equilibrium. Affinity (hereafter substituted by term 'attraction'), within matter-content, is applied inward at every peripheral points of quantum of matter. At each of peripheral points, (resultant) inward efforts act along normal at that point. Quantum of matter is in equilibrium because all efforts (from peripheral points of quantum of matter) and hypothetical efforts (applied at ends of its major axis), together, do not produce a resultant. Hence, quantum of matter is static and it is in equilibrium 2D spatial state.

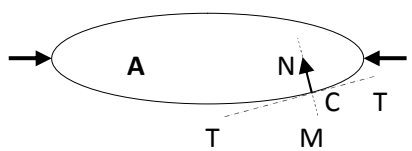

Figure 2.3

Let C be a peripheral point of quantum of matter, A. TT is tangent and NM is normal at C. Inward attraction from peripheral point C, shown

by arrow CN, is applied along CN. Similar inward attractions are applied at every point on periphery of quantum of matter. Let us suppose that attraction CN is removed or nullified. This can be done by another quantum of matter making contact with quantum of matter A, at point C on its periphery.

Inward attractions, applied at peripheral points of quantum of matter A (other than at point C) and hypothetical efforts applied along its major axis, together form a resultant. This resultant is of same magnitude as missing inward attraction at C (whose presence was required for equilibrium) and in opposite direction to arrow, CN. Action of resultant effort is along CM – outward from quantum of matter, A. As a result, efforts from within quantum of matter are capable of transferring its matter-content in the direction CM, in space. Matter-content of quantum of matter A tends to displace in direction CM, as long as another quantum of matter is making contact with it at point C.

If peripheral point C is prevented, by some mechanism, from being displaced in space, resultant action trying to displace quantum of matter A will experience an equal and opposite reaction from that mechanism. This reaction, equivalent in magnitude to original attraction, substitutes for inward attraction from peripheral point C, towards matter-content in quantum of matter A. Quantum of matter A regains its equilibrium and static state.

Removing hypothetical efforts, applied at ends of major axis of quantum of matter A (as shown in figure 2.3), restores its characteristic properties and quantum of matter starts its self-constriction and self-elongation.

Figure 2.4 shows end of a free quantum of matter A, in contact with an external object at peripheral point C. XX is major axis of quantum of matter. TT is tangent to periphery at C. MN is normal to tangent at C. Removal of inward attraction at point C, on periphery of quantum of matter A by contact with another object, makes its contribution to magnitudes and directions of self-elongation and self-constriction of quantum of matter A. In a free quantum of matter, direction of self-elongation is along its major axis, XX. With inward attraction along CN absent, there is additional tendency for matter-content to elongate along CM. Direction of resultant self-elongation deflects clockwise (as shown in figure) from major axis XX to X'X', shown in dashed line.

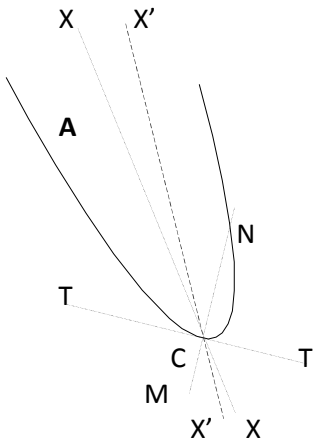

Figure 2.4

Inward attractions from peripheral points produce self-elongation of matter-content in the direction of resultant, which is deflected from major axis of quantum of matter A. Major axis of quantum of matter A now shifts in the direction of its self-elongation. In this case,

as shown in figure, shift in direction of self-elongation displaces (rotates) quantum of matter A, clockwise, in space. Direction of rotation is away from the acute angle between tangent at the point of contact with external object and own major axis.

Figure 2.5 shows a quantum of matter, A, whose self-elongation is restricted by line TT (a hypothetical obstruction) in same dimensional spatial system. This could be by presence of another quantum of matter that has is presence in same dimensional spatial system, at point C. Line TT is in contact with quantum of matter A at its peripheral point C. TT is tangent to periphery of quantum of matter at C. MN is normal to tangent at point C.

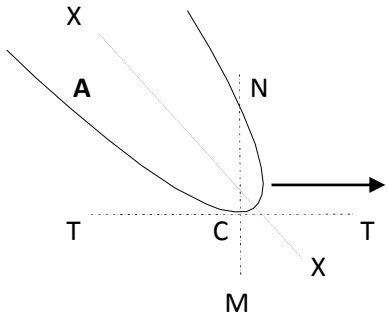

Figure 2.5

Consider centre point of quantum of matter A as a reference point. As quantum of matter A is free, it self-elongates. If major axis of quantum of matter A is perpendicular to line TT, its matter-content cannot extend towards line TT. Instead its matter-content extends in opposite direction (by twice the length of its extension in one direction), carrying the reference point away from line TT. Quantum of matter A experiences neither translational nor angular motion during extension of its body by displacement of its matter-content. However, its matter-content displaces in space, with respect to its central point.

If major axis of quantum of matter A (as shown in figure 2.5 2.3D - I) is at an acute angle to line TT, self-elongation of quanta of matter A produces both translational and angular displacements of its matter-content, besides self-elongation. Due to angular position (away from normal at C) of its major axis, extension of quantum of matter A is not wholly restricted by line TT. Matter-content of quantum of matter A tends to displace (slide) over line TT, in a direction (shown by arrow, parallel to line TT) away from acute angle XCT. Magnitude of rate of sliding motion is inversely proportional to cosine of acute angle XCT. It is highest for very small angle and it will become zero when matter-content of quantum of matter A is perpendicular to line TT.

As reference point (centre of matter-content) is displaced away from line TT, point of intersection between line TT and major axis of quantum of matter A is displaced along line TT in a direction opposite to acute angle between line TT and major axis of quantum of matter A. Since contact between quantum of matter A and line TT is maintained at C by continuous extension, quantum of matter A slides, until it reaches end of line TT.

Figure 2.6 depicts angular displacement of quantum of matter A, shown in figure 2.5. Point of contact of quantum of matter A (as shown in figure 2.6) is at C, slightly away from intersection of quantum of matter's major axis XX on tangent TT. Angle between major

axis XX and normal CN, at point of contact C deflects direction of self-elongation of matter-content. Resultant direction of extension of quantum of matter A is along X'X', which is at an angle to quantum of matter's major axis XX. Shift in the direction of matter-content tends to deflect quantum of matter's major axis towards line X'X' (as shown by angular arrow).

Quantum of matter A keeps its contact with line TT and turns in space, while sliding along line TT. Displacements may be considered with respect to line TT or with respect to centre of matter-content. These displacements, together, shifts point of contact of quantum of matter A on line TT to right (in the direction opposite to acute angle between major axis of quanta of matter A and line TT. Quantum of matter A not only turns in space but also travels along the length of line TT. Displacement of matter-content of quantum of matter A along line TT continues until it reaches end of line TT or until matter-content of quantum of matter A becomes perpendicular to line TT, when there is no lateral component, present in its self-elongation.

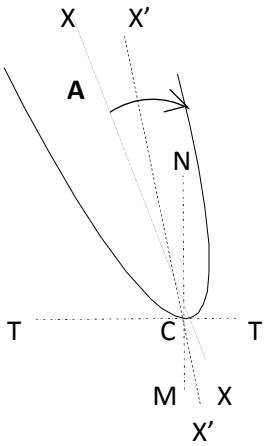

Figure2.6

Usually, when two quanta of matter are in contact, sliding of one quantum of matter continues to end of another quantum of matter, whose matter-content is assumed here as line TT. Ends of quanta of matter are curved. Hence, rotary and translational displacements of quantum of matter A continue as long as direction of self-elongation of its matter-content differs from its major axis. When two quanta of matter are in contact, with their matter-contents along same straight line, direction of their major axes and directions of their self-elongations coincide. Tendency to displace their matter-contents along same straight line create push actions on each other, which in turn tend to compress each other from their ends.

Although, these relative displacements are results of separate displacements of matter-contents of each quantum of matter, they may appear to take place due to mutual influence between quanta of matter in contact. Relative displacements between quanta of matter in contact, as described above, are the only actions, matter is capable of doing on its own. All other actions, noticed in nature are derived from relative displacements of quanta of matter, by external efforts within structures they form.

For easier explanations, these relative actions of quanta of matter (in contact with each other) may be rephrased in conventional terms as; matter-contents of two quanta of matter (whose major axes are at an angle to each other) in contact, 'attract' each other. As end of a quantum of matter makes contact with matter-content of another quantum

of matter (in same spatial dimension), it is 'attracted' towards end of other quantum of matter. If ends of two quanta of matter are in contact, they tend to line up in a straight line. This type of reasoning is followed in explanations, given below.

Matter-content of a quantum of matter is a wholesome body. It cannot amalgamate into matter-content of another quantum of matter. Adhesion within matter-content of a quantum of matter keeps it as an independent entity 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 single matter-body with respect to matter-contents of other quanta of matter, with which it is in contact.

Due to continuous stabilizing actions in universal medium, none of its constituent quantum of matter is ever in steady state. Continuous relative motions between quanta of matter in contact reduce average adhesion between their matter-contents to much less than adhesion present within matter-content of a quantum of matter. As there is a distance between matter-contents of two quanta of matter in contact (however small it may be), adhesion between their matter-contents is less than adhesion within matter-content of same quantum of matter. Hence, even if a (1D or 2D) quantum of matter pierces through another (1D or 2D) quantum of matter or be part of same (2D or 3D) matter-bodies, their matter-contents cannot blend or merge with each other.

2.5.2. Co-existence of matter-bodies:

Matter, as substance, provides an entity with its objective reality. Every real object has positive existence in space. Real objects occupy whole volume of space, where they exist. Therefore, two separate 3D matter-bodies cannot simultaneously exist in same location in space. Space, being a container of all 3D matter-bodies, each of 3D matter-bodies (in nature) are situated at different locations in space.

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

However, there is a lower limit (which is constantly being widened by newer instruments) to measure distances in any spatial dimension. A distance that is absolutely intangible by our 3D standards could be counted only as negligible or functional, without real meaning in the sense of measurement of distance. Although it is not correct by

absolute standards, we are bound to ignore such measurements or consider them as non-existent.

If one spatial measurement of a 3D matter-body falls in this category, we are bound to consider that body, as a 2D matter-body that has its tangible body-dimensions only in 2D spatial system. This matter-body, for all practical purposes is treated as a 2D matter-body. If two spatial measurements of a 3D matter-body fall in this category, we are bound to consider it, as a 1D matter-body that has its tangible body-dimensions only in 1D spatial system. This matter-body, for all practical purposes, is treated as a 1D matter-body. However, it should be very clear that both, 1D and 2D matter-bodies have their existence in all three spatial dimensions like any other 3D matter-body.

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

Now, let us reduce widths of vessel's arms. Water in central part of vessel continues to be parts of 3D matter-bodies in both sets of arms, until width of one or both sets of arms are reduced to size of a water molecule. If width of one or both sets of arms is reduced further, water molecule at center of vessel will no more be able simultaneously to be parts of both 3D matter-bodies, contained in straight-line sets of arms of vessel. It will be part of either of the 3D matter-bodies.

At this stage, 3D matter-bodies in both sets of arms will no more be able to co-exist at central part of vessel. Inability of these 3D matter-bodies to co-exist is due to sub-structure of water molecules. Sub-structures of molecules or atoms demand that each molecule or atom can have only certain particular formations with their neighbors. If this particular type of formations can be preserved by molecule or atom at an intersection, any number of 3D matter-bodies can co-exist in space. However, as each type of atom or molecule is unique, this is not practical in cases, where thickness of 3D matter-bodies approach very small values. Cases are similar with smaller 3D matter-particles also. Hence, it is impossible for two structured (individual) 3D matter-bodies to co-exist at a point in space.

2.5.3. Co-existence of quanta of matter:

Let us consider two (hypothetical) free 1D quanta of matter, in different spatial dimensions and whose matter-bodies pass through a point in space, as shown in figure

2.7. Dimensional measurements of quanta of matter in their width and thickness are at minimum possible values. Self-constriction due to self-adhesion of matter-contents in both spatial dimensions of its negligible existence has reduced to zero value (by 3D spatial standard). Therefore, these quanta of matter have no effective borders (perimeters shown in dotted lines) in these spatial dimensions.

In figure 2.7, 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 colored 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 their intersection is able to act as parts of both quanta of matter. Quanta of matter are not overlapping but they co-exist at the point of intersection. Matter-content in one quantum of matter is not superimposed on other. Consistency of matter-content (and matter-density) at the intersection is same as it is for rest of matter-contents in both quanta of matter.

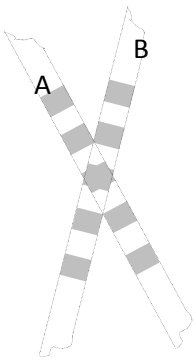

Figure 2.7

Let us consider two quanta of matter, A and B, in their 2D states. 2D quantum of matter A is under constant external efforts which maintains its steady 2D spatial state, while 2D quantum of matter B is free. Quanta of matter A and B exist very near and in different planes so that 2D quantum of matter B can extend in one direction only through (plane of) 2D quantum of matter A.

As quantum of matter B is free, by its inherent property, it extends in 1D space. There comes a time when one end of its matter-content touches (plane of) quantum of matter A, at an angle to its plane. As self-adhesion of matter-content in quantum A is only in its plane, and matter-content of quantum B is not touching its perimeter in its plane, self-adhesion of quantum of matter A does not affect matter-content of quantum of matter B, to cause its translational and/or angular displacement.

Similar is the case of matter-content in quantum of matter B. In other words, self-adhesions of matter-contents in both quanta of matter do not affect each other. However, quantum of matter B has to extent in its 1D space, which passes through matter-content of quantum of matter A. As their matter-contents do not affect each other, matter-content of quantum of matter B is unhindered in its self-elongation. It extends through matter-content of quantum of matter A

Matter-content, at their point of intersection, not only belongs to both quanta of matter but magnitudes of matter-contents in both quanta of matter are also increased, each one (approximately) by half the amount of matter-content at their intersection. Matter-content at their point of intersection is shared by both quanta of matter. This is

possible only because of structure-less nature of matter in them. In fact, individual matter-contents of both quanta of matter do not occupy space of their intersection but matter-content at their intersection is shared by both quanta of matter.

Matter-contents of quanta of matter being structure-less, points in them do not have any sort of directional properties to select their neighboring points. Their behavior is identical in all directions. Hence, any point at intersection of quanta of matter is able to function as part of both quanta of matter. This phenomenon may be understood as 'coexistence of quanta of matter' at their intersection.

If both 2D quanta of matter A and B are in same plane their behavior during attempt by quantum of matter B to cross quantum of matter A is different. As soon as 2D quantum of matter B touches periphery of 2D quantum of matter A, interaction between their matter-contents across their peripheries induces translational and angular displacement of 2D quantum of matter B and prevent their matter-contents from crossing into each other. They will keep their individuality as separate entities and they cannot coexist in same volumetric space in same plane.

A free 1D quantum of matter exists only in its own 1D spatial system. Hence, a 1D quantum of matter is able to coexist with another 1D quantum of matter in all spatial dimensions other than its own.

A 2D quantum of matter exists in a plane. A 1D quantum of matter is able to coexist with it, in all spatial planes other than in the plane of 2D quantum of matter. When located in the plane of 2D quantum of matter, a 1D quantum of matter maintains its individuality, even if it is a component of a 2D entity, constituted by one or more 2D quanta of matter, without gaps between neighboring quanta of matter.

A 3D quantum of matter exists in all spatial planes passing through its matter-content. A 1D quantum of matter is unable to coexist with 3D quantum of matter or with any constituent quanta of matter of a 3D matter-body, in any of the planes passing through them. Even if 1D quantum of matter is a constituent part of 3D matter-body along with 3D quantum of matter, it will keep its independence and integrity as a separate entity, within the 3D matter-body, without gaps between neighboring quanta of matter.

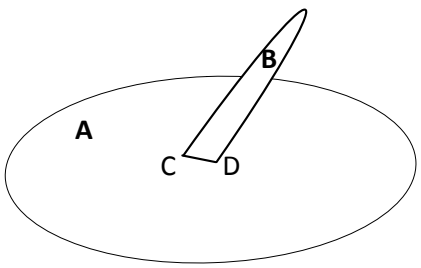

Figure 2.8

Consider a 1D quantum of matter, B, co-existing with a 2D quantum of matter, A, as shown in figure 2.8. They obviously are in different planes. 1D quantum of matter B is at an angle to the plane of 2D quantum of matter A. (Plane of) 2D quantum of matter A is passing through 1D quantum of matter

B, so that matter-content of 1D quantum of matter is bisected at CD (line CD is negligible width of 1D quantum of matter, greatly exaggerated in figure). Since 2D quantum of matter A has no thickness, 1D quantum of matter B does not suffer discontinuity.

As explained in section 2.4.6, interactions (or attraction), between matter-contents of two quanta of matter in contact, are through their points of contact. In this case, points of contact between quanta of matter A and B are along line CD. Attraction between matter-contents of quanta of matter has to originate at perimeters of quanta of matter and act along straight lines passing through points of contact. As can be seen from the figure, there are no straight lines originating at perimeter of quantum of matter B, touching line CD and terminating at perimeter of quantum of matter A. Hence, there can be no interaction between matter-contents of quanta of matter A and B. Matter-content along the line, CD, exists as part of both quanta of matter simultaneously. Both quanta of matter maintain their continuity in their respective spatial dimensions.

Let an external pressure act on 2D quantum of matter, A, such as to convert it into a 3D matter-body. Existence of a 3D matter-body, at the point of bisection of 1D quantum of matter B, tends to divide it into two parts. However, at the instant of conversion of 2D quantum of matter A into a 3D object, a partition tends to develop at the point of intersection, CD of 1D quantum of matter B and 3D object. Self-elongation efforts, within 1D quantum of matter B, on either side of partition are proportional to lengths of parts being formed.

In order to fill entire space without void, quanta of matter and latticework-structures formed by them (universal medium) have to criss-cross in all possible directions and planes. This is made possible by ability of quanta of matter to coexist with each other, when in different planes. Only such structures can avoid any possible empty spaces between various planes. Without voids in space, quanta of matter in universal medium and basic 3D matter-particles in it, together, form a single block of matter (of constant matter-density) that fills entire space.

As entire space is filled with quanta of matter, in all possible directions, one quantum of matter in its 1D state has to cross great many quanta of matter, with which it coexists. In order to avoid empty space, quanta of matter have to fill all possible voids. Consider removal of a single quantum of matter from its natural location in space. This is bound create voids, where its own matter content existed. As matter-contents at all other places were shared, absence of one quantum of matter may make little difference. Matter-content, occupied the vacant places, which appeared on removal of one quantum of matter, were the only part of matter-content that belonged solely to the quantum of matter, which was removed. At all other places of its existence, it shared matter-contents with numerous other quanta of matter.

Effective length of a 1D quantum of matter, as a constituent of universal medium, is much greater than its length in free state. This helps to increase sizes of squares in latticework-structures of universal medium. Larger squares in latticework-structures make it easier to create anisotropy (whenever needed) that is necessary for fluidity of universal medium.

2.5.4. Preservation of individuality:

1D quanta of matter, shown in figure 2.7, together define a plane. If one of the quanta of matter grows in this plane, into its second spatial dimension (due to inward external effort applied at its ends), both quanta of matter would be simultaneously occupying same dimensional space. They cannot continue to coexist at their point of intersection.

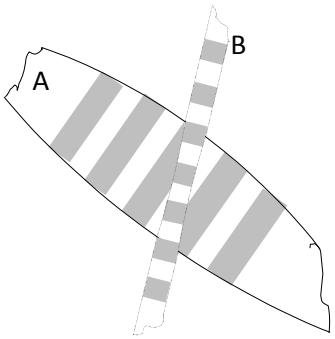

Figure 2.9

As soon as one of the quanta of matter, A, grows into its second spatial dimension, self-constriction develops in its matter-content, against external pressure at its ends. These inward efforts (towards major axis of its matter-content) gives quantum of matter, A, a definite border (as shown in figure 2.9 by bold curved lines), to become a 2D quantum of matter. As both quanta of matter occupy same dimensional space, during its development into second dimensional space, quantum of matter, A, tends to partition 1D quantum of matter, B, into two parts. But borders of 2D quantum of matter, A, now provide anchoring points for self-adhesion of quantum of matter, B, to withdraw all its matter-content to one side (as given below) and exit from space occupied by quantum of matter, A, which has developed into second spatial dimension. Similar action takes place during change of 2D quantum of matter into 3D entity.

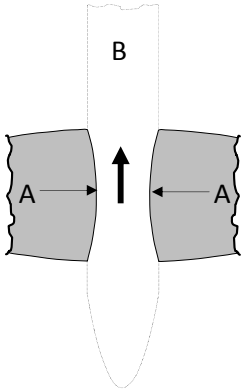

Figure 2.10

Figure 2.10 shows representation of two intersecting quanta of matter. Quantum of matter, B, is in its 1D spatial status. Its matter-content cannot be compressed any more, in width and thickness. Its upper end (as shown in figure beyond quantum of matter, A, is much longer than lower end. Quantum of matter, A, is at the instant of conversion from 1D spatial status to 2D spatial status in the plane of paper. As external pressure at quantum of matter, A, overcome its self-elongation, it increases its width. Increasing self-constriction of its matter-content forms definite border around quantum of matter, A,

except where quantum of matter, B, exists. As quantum of matter, B, is already in its 1D status, its size in the plane of quantum of matter, A, cannot be reduced any further. Reduction of width, shown in the figure, is symbolic and highly exaggerated. It, more or less, indicates directions of effort transmitted to quantum of matter, B, (shown by thin arrows) through quantum of matter, A, from external pressure at ends of quantum of matter, A.

External effort, transmitted through quantum of matter, A, to quantum of matter, B, tends to create internal pressure within matter-content of quantum, B. Since matter-content of quantum of matter, B, cannot be compressed any further, in this spatial dimension, effort generated will be used to produce translational displacement of quantum of matter, B. [Like a slippery incompressible body, pressed between two rigid matter-bodies, is jettisoned away from rigid matter-bodies]. Minute curvatures, produced at the site of compression help to convert compression into translational motion. Resultant of translational efforts on upper and lower parts of quantum of matter, B, push out its matter-content from quantum of matter, A.

Due to self-adhesion of structure-less matter, continuity of matter-content in spatial dimension of quantum of matter, B, cannot be broken. Since matter-content of quantum of matter, B, is continuous in its spatial dimension, whole of its matter-content will be transferred in resultant direction of translational efforts, as shown by thick arrow. Action will continue until any one end of quantum of matter, B, disappear into matter-content of quantum of matter, A. Matter-content, outside quantum of matter, A, in 1D spatial dimension, will now form independent quantum of matter, B.

Direction of resultant translational effort on matter-content of quantum of matter, B, depends on curvatures formed by matter-content of quantum of matter, A, at their intersection. For same effort, development of internal pressure in a larger volumetric space is slower than in a smaller volumetric space. Hence, usually, matter-content in larger end of quantum of matter, B, has lower internal pressure during its development. This encourages matter-content of quantum of matter, B, to displace towards its longer end.

Formation of partition, slightly away from center point of quantum of matter, B, with uneven curvature, produces imbalance in self-constriction and self-elongating efforts within matter-content of 1D quantum of matter, B, towards its ends. Longer part may have higher self-elongating effort with lower self-constriction and shorter part may have lower self-elongating effort with higher self-constriction. Partition, at the instant of its formation, provides an anchoring point for these efforts. As a result, 1D quantum of matter, B, as a whole, experiences a resultant effort to displace 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 formation of intruding object in its dimensional space.

Translational movements, described above means only displacement of matter-content of one quantum of matter out of space occupied by another quantum of matter. It does not signify motion of quantum of matter, as we understand 'motion' in 3D spatial system. Quantum of matter is not displaced through space, as is required for its motion. As far as a single quantum of matter is concerned, there is neither space nor motion. Any transfer of matter-content with associated displacement of a single quantum of matter does not qualify as motion. Therefore, properties associated with motion of 3D matter-bodies; like inertia, velocity, etc. are not applicable in these cases.

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

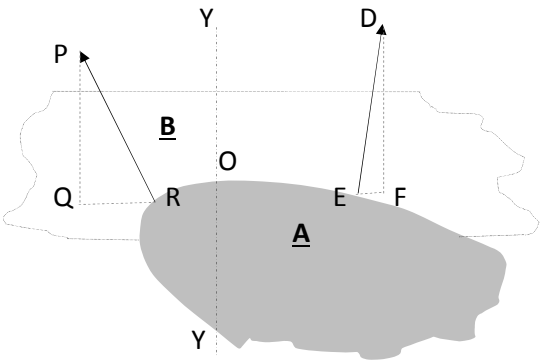

Figure 2.11

Let an external pressure act all around perimeter of 2D quantum of matter, A, such as to convert it into a 3D matter-body. Existence of a 3D matter-body at the point of intersection of 1D quantum of matter tends to part 1D quantum of matter into two parts. However, by quantum of matter's inherent nature, it is unusual for matter-content of a quantum of matter to be cut into two or made smaller by reducing its matter-content. At the instant of conversion of 2D quantum of matter, A, into a 3D object, a partition tends to develop at the point of intersection of 1D quantum of matter and 3D object. Self-elongating efforts, within 1D quantum of matter, B, on either side of this partition is proportional to curvature and lengths of parts forming, as explained above and considered with respect to figure 2.11.

[If 1D quantum of matter is already a part of a quanta-chain, attraction to its neighbors is proportional to length of parts of 1D quantum of matter, B, being partitioned]. Thickness of 2D quantum of matter, A, at the instant of its conversion to 3D object corresponds to thickness of a plane, in 3D spatial system. Thickness below this limit is considered as functional or non-existent.

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

In figure 2.11, B, with dotted lines as its border, represents part of a 1D quantum of matter. 'A' represents part of a 2D quantum of matter or part of a 3D matter-particle, intruding into spatial dimension of 1D quantum of matter, B. Line YY is perpendicular to tangent at contact point, parallel to major axis of 1D quantum of matter. Curvature of perimeter of 2D quantum of matter on either side of line, YY, is considered as of different values. Arrows RP and ED represent directions of self-constriction in matter-content of quantum of matter, B.

Due to curvatures of parts of 1D quantum of matter's perimeter, directions of self-constriction are not even on either side of line, YY. Horizontal components of self-constriction of either sides of line, YY, are in opposite directions. Magnitudes of their resultants on either side of line, YY, depend on the curvature of intruding part of 2D quantum of matter. Difference in resultant effort compel matter-content of 1D quantum of matter, B, to displace towards the part that has higher resultant effort. Usually whole matter-content of 1D quantum of matter should displace to one side of intruding entity before intrusion can part 1D quantum of matter into two independent 1D quanta of matter.

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

matter to move its whole matter-content to one side of intrusion, with higher resultant effort, may be too long to prevent division of its matter-content into two separate quanta of matter.

2.5.5. Interaction between quanta of matter:

If there are more than one quantum of matter in same plane and they are touching each other, their matter-contents (being in contact) influence each other, due to self-adhesion of structure-less matter across the point of contact. If there is no direct contact, matter-contents of quanta of matter cannot influence each other. Irrespective of strength of their mutual contact, adhesion between their matter-contents is less than cohesion within matter-content of a quantum of matter for two reasons. (1) Distance between two quanta of matter will always be more than distance between two adjacent points within matter-content of a quantum of matter. (2) Since point of contact between two quanta of matter is never fixed, adhesion between two quanta of matter through same point of contact is not continuous.

Matter-contents of quanta of matter, in contact, attract each other and tend to merge to form a single unit in 1D space. Adhesion between matter-contents of two quanta of matter, in contact, is usually supplemented by attempt by one of them to elongate into spatial dimension occupied by another. In any case, no action can be performed through empty space and there are no empty spaces, in this concept. In order to invoke interaction between two 1D quanta of matter, participants have to be in direct contact with each other. There is no preferred or selective contact; all naturally occurring contacts between quanta of matter are by chance.

Other than for its ability to extend itself and to attract other quanta of matter in contact, a quantum of matter is incapable of any other actions. It can be said that as far as external actions are concerned, a quantum of matter is inert. Although they are able to extent themselves by displacing matter-contents, they are incapable of any motion on their own. Hence, two quanta of matter can make contact only by their lengthening process. If one quantum of matter happens to be on the way of extension of another, they will make bodily contact. In order to make bodily contact, participating quanta of matter have to be in same spatial dimension. It is highly improbable for two quanta of matter to be in same 1D spatial system, when their matter-contents meet.

If two 1D quanta of matter are near and in different spatial dimensions, extending matter-content of one of them is able to pass through matter-content of the other. Their matter-contents co-exist rather than make contact with each other. To make contact they have to exist in same spatial dimension, with defined borders. For this, at least one of them has to have a defined second spatial dimension. Therefore, in this paragraph, interacting quanta of matter are depicted to have widths, slightly more than negligible values. Second spatial dimension for both interacting quanta of matter is same plane.

Since entire space is filled with universal medium, a free quantum of matter cannot be larger than probable gaps in its latticework-structures. Usually, at the instant of liberation from latticework-structure of universal medium or from a basic 3D matter-particle, a quantum of matter is shorter than a quantum of matter, constituting latticework-structure of universal medium. This is much smaller than gaps in latticework-structure of universal medium.

Most probably, two free 1D quanta of matter in contact are at an angle to each other, in same second spatial dimension. At the instant of their contact, two quanta of matter together, define a plane that contains the angle between them. This is the plane of their existence and interaction. From then onwards, these quanta of matter can have mutual interactions or relative displacements only within this plane, defined by them. They become unable to act or being acted upon in any other plane. Any other quantum of matter, at an angle to this plane may pass through and coexist with them. Since two quanta of matter in contact are separate entities, tendency of their matter-contents to coagulate (with each other) can only produce an affinity, similar to attraction, between them. Interaction between two quanta of matter, in contact, is only through the point of their contact.

For theoretical consideration, we may take two free quanta of matter, which have slightly greater width than negligible value, in a plane. Both of them elongate − each one along its own major axis. They may make contact with each other, in 1D spatial system, only if their major axes are in a straight line and within range of their extensions. The very fact that they are capable to elongate suggests that during process of elongation, they have not reached stable 1D state yet. They are able to elongate because they are free and they exist in higher spatial dimensional state. In order to make contact with each other, they should have their existence in one common 2D spatial system. If two quanta of matter with their widths in different planes happen to be at an angle to each other, each of them elongate along its own major axis and their matter-contents cross each other without mutual interference.

In nature, no quantum of matter can reach its single dimensional spatial state, fully. Least a quantum of matter may reach is 2D spatial system, with (almost) negligible width, on the border between 1D and 2D states. Matter-contents of two quanta of matter in different straight lines and touching or crossing each other can produce no attraction between their matter-contents. In this case, each of the quanta of matter exists in its own spatial dimension without hindering other's existence. They co-exist at their point of contact.

We shall consider two hypothetical free quanta of matter in empty space. Since they are free, both of them tend to grow along their major axes in their single spatial dimensions. Two quanta of matter A and B, shown in figures 2.12 to 2.16, are greatly

enlarged so that their negligible existence in second spatial dimension show up as widths 'W' and 'w'. Quanta of matter are in contact with each other in same spatial dimension. For the time being, we may neglect changes of matter-content in quantum of matter A and contemplate changes in matter-content of quantum of matter B, due to its self-elongation. Changes in matter-content of quantum A are similar to those taking place in matter-content of quantum of matter B, but corresponding to its relative position with respect to quantum of matter B.

Figures 2.12 to 2.16, show one end of quantum of matter B in contact with quantum of A (in static state) and sequence of resulting displacement of its matter-content. Lines 'aa' is major axis of quantum of matter A. Lines 'bb' is major axis of quantum of matter B. Lines TT are tangents and lines NN are normal at point of contact between peripheries of quanta of matter in second spatial dimension, defined by angle between their major axes.

Points O are intersections of normal NN and major axis bb. Arrows OC represents magnitude and direction of self-elongation of matter-content of quantum of matter B due to its direct contact with matter-content of quantum of matter A. Magnitude of self-elongation due to peripheral contact is of constant value, irrespective of relative positions of quanta of matter. Arrows OD represent inherent self-elongation of free quantum of matter B along its major axis. Magnitude of inherent self-elongation is inversely proportional to width of a 2D quantum of matter and increases at an accelerating rate as quantum of matter elongates in its first spatial dimension. Arrows OR represent magnitude and direction of resultant self-elongation of quantum of matter B.

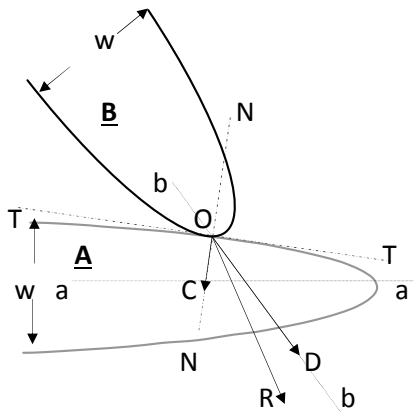

Figure 2.12

Figure 2.12 shows relative positions of quanta of matter, when free quantum of matter B is making peripheral contact with static quantum of matter A, in same second spatial dimension. Due to presence of quantum of matter A on its way of self-elongation, quantum of matter B is unable to freely extend in the direction of quantum of matter A. Most of its inherent self-elongation is used to displace its matter-content away from quantum of matter A. Unless major axes of quanta of matter are perpendicular to each other, a small part of self-elongation takes place towards quantum of matter A, along arrow OD.

Peripheral contact with quantum of matter A creates a break in periphery of quantum of matter B and removes inward affinity of matter-content from peripheral contact. Matter-content of quantum of matter is now able to self-elongate in the direction of arrow OC

also. Resultant displacement of matter-content is in the direction of arrow OR. End of quantum of matter B, in contact with quantum of matter A will slide along periphery of quantum of matter A towards its end. Due to clockwise deflection of resultant self-elongation OR from major axis bb, quantum of matter B simultaneously acquires additional clockwise angular displacement.

Figure 2.13 shows gradual advance of quantum of matter B, towards end of quantum of matter A. Due to reduction in second spatial dimension of quantum of matter B, its width has decreased with corresponding increase in self-elongating effort. Magnitude of self-elongation along arrow OC remains constant. Resultant self-elongation displaces matter-content of quantum B towards end of quantum of matter A and turns it clockwise towards perpendicular to major axis of quantum of matter A. If opposite end of quantum of matter B is also blocked in its extension, its rates of sliding and angular deflection will be correspondingly higher.

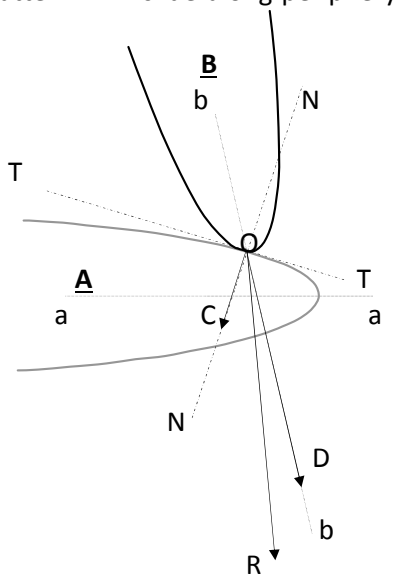

Figure 2.13

Figure 2.14 shows relative positions of quanta of matter A and B, at a stage, when they are positioned perpendicular to each other and their ends are in contact with each other. In this position, self-elongation of quantum of matter B tends to displace its matter-content across major axis of quantum of matter A. Should this happen, end of quantum of matter A will slide over matter-content of quantum of matter B, away from its end. Such an action is against tendency of quantum of matter A, in its free state, to displace itself towards end of quantum of matter B. As these actions are contradictory and because junctions between quanta of matter usually have (ends of) more than two quanta of matter, we may consider that quantum of matter B has no tendency to displace its matter-content across major axis of quantum of matter A. Consequently, quantum of matter B displaces its matter-content angularly in clockwise direction.

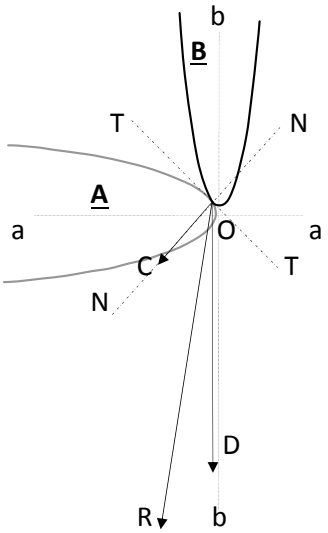

Figure 2.14

While matter-content of quantum of matter slides towards the end of quantum of matter A and turns in clockwise direction in space, matter-content of quantum of matter A also undergoes similar actions. Matter-content of A slides towards end of quantum of matter B and turns in anti-clockwise direction, in space.

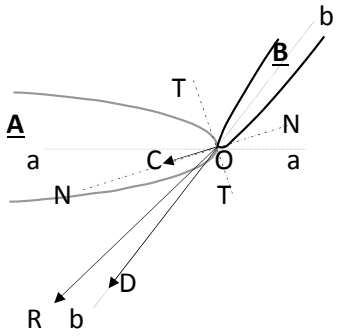

Figure 2.15

Figure 2.15 shows gradual rotation of quantum of matter B, in second spatial dimension, about end of quantum of matter A. Quanta of matter A and B proceed towards end-to-end contact.

Figure 2.16 shows relative positions of quanta of matter A and B, when quanta of matter A and B have turned to bring its major axis in straight line and link with each other. In this position, self-elongations (inherent and due to peripheral contact) from both quanta of matter are along their major axes. Self- elongations by both quanta of matter, when active, are in opposite directions. They apply mutual compression on each other's matter-contents. They have no tendency to slide over each other or to turn in space. It may appear that removal of inward affinity at peripheral contact point between quanta of matter A and B, when they are positioned in a straight line and resultant self-elongation by quanta of matter towards each other may encourage amalgamation of their matter-contents. This is prevented by removing direct contact between quanta of matter in a straight line by further developments in linkage. Thus, it becomes an inherent property of free quanta of matter, in direct contact, to link together in straight line and form 'quanta-chain' in 1D space.

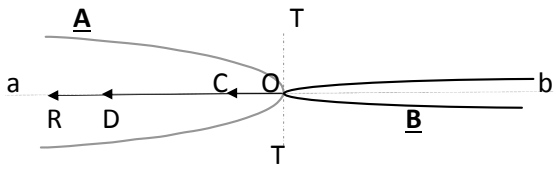

Figure 2.16

A free quantum of matter, making contact with a 2D or 3D matter-body, interacts with them in a similar manner as explained above. Let one end of a quantum of matter, during its self-extension, makes contact with a 2D matter-body (another quantum of matter that is under compression and is already converted into a 2D object). Affinity from matter-content of quantum of matter acts between their matter-contents to move the quantum of matter towards edge of 2D matter-body in the direction of inclination of quantum of matter to 2D matter-body.

Normally a 2D entity, in its critical equilibrium state, can only be in circular shape and hence it will have no end but two or more points of contact with other quanta of matter, applying external pressure on it. Only in its unstable conditions, a 2D entity may have

straight sides and ends as its periphery. Once external quantum of matter reaches one of contact points on perimeter of 2D matter-body, mutual affinity tends to turn all quanta of matter at the junction into a stable configuration in the plane of 2D matter-body. If approaching quantum of matter and 2D entity are in different planes, quantum of matter will grow through 2D entity without hindrance. At the point of their intersection, both quanta of matter and 2D matter-body will co-exist.

Should a quantum of matter be in contact with a 3D matter-body (one or more quanta of matter under compression and are already converted to a 3D object), in its critical equilibrium state, affinity of matter-content of quantum of matter moves it in the direction of its inclination on 3D matter-body's surface. 3D matter-body is maintained in stable state by numerous quanta of matter compressing all around its matter-content. Since a 3D body has no definite edge, if unrestricted, external quantum of matter will continue to move along the surface of 3D matter-body until it reaches a junction-point between 3D body and another quantum of matter. Thereafter, quanta of matter at the junction will settle down to a stable configuration.

2.6. Universal medium:

All free quanta of matter in universe, which may come in contact with each other, tend to link together in straight lines and form quanta-chains in all possible directions and planes, as described in last section. Quanta-chains may extent infinitely in space. Formations of quanta-chains and their combinations into latticework-structures are natural developments, wherever free quanta of matter are available. As they are formed by quanta of matter, quanta-chains and latticework-structures are real entities, which have objective existence in space. Latticework-structures by quanta-chains in every possible spatial plane, together, form an all-encompassing universal medium.

Due to self-constriction of quanta of matter, combined body of a quanta-chain tends to elongate at a higher rate. Let outer ends of quanta-chain have certain restriction to their displacements that resists self-elongation of quanta-chain and acts as an external pressure applied from its ends against self-constriction. Combined body of matter-contents in quanta of matter in quanta-chain tends to develop internal pressure, as a reaction to external pressure applied from its ends.

In a quanta-chain of many quanta of matter (in a straight line of infinite length), ends of individual quantum of matter can extend only by moving neighboring quanta of matter. When there are too many quanta of matter in a quanta-chain, compression is felt at ends of all quanta of matter in quanta-chain. Compression is highest at the middle of quanta-chain and gradually reduces towards end of quanta-chain.

Extents of quanta-chains, in nature, are infinite in both directions. Considering infinite extent of universe, a quanta-chain has no ends. Infinite lengths of quanta-chains provide

restrictions to self-elongation of their constituent quanta of matter. Hence, all quanta of matter in all quanta-chains are under similar compression. Spatial dimensional status of quanta of matter in quanta-chains depends on general nature of quanta-chains in a region. Restriction to motion of end of a quanta-chain is removed, when there is a break in quanta-chain and quanta of matter on either side of the break become ends of quanta-chains on two sides of the gap.

Theoretically, one or few quanta of matter, in a chain, can extend infinitely in their one-dimensional spatial system to form a 1D chain across a large distance. Under this case, it may be questioned how come there too many quanta of matter in a quanta-chain forming part of universal medium. There are many and frequent occasions (as described later in this text), during which individual quantum of matter is able to migrate into middle of a quanta-chain or moves out of a quanta-chain at any point in it. Frequent transfer of quanta of matter from and to quanta-chain and abundant availability of free quanta of matter in nature ensures there are infinite number of quanta of matter in any quanta-chain, formed as part of universal medium.

Variation in number of quanta of matter in a quanta-chain (per unit length) may alter compression on them. Variation in compression in a quanta-chain is moderated by presence of quanta-chains in perpendicular directions in latticework-structure. In due course of time (from a presumed origin of universe), number of quanta of matter, forming each quanta-chain in space, has (increased and) reached the present status. Great many quanta of matter in every quanta-chain keep it under compression from their ends, as required for present state of universe.

Depending on magnitudes of compression, applied at both ends, length of a quantum of matter in quanta-chain is reduced to a minimum limit. Reduction in length is made possible by growth of its matter-content in width. Increase in width of a quantum of matter, while it is part of a quanta-chain, is so negligible that in stable state of quanta-chain, it is not sufficient to be recognized as growth into 2D spatial system. Further contraction of its length is possible only if its body grows into second spatial dimension. Therefore, quanta of matter forming a quanta-chain may be considered to remain at minimum length and be a part of a one-dimensional quanta-chain, provided, no other efforts influence them.

Although quanta of matter, forming a quanta-chain, are considered in their first spatial dimension, they do have certain negligible width in second spatial dimensional system formed by them. As long as a junction is maintained, further growth or actions by participating quanta of matter at the junction are restricted to first and second spatial dimensions, set by quanta of matter (plane containing all quanta of matter), at the junction.

2.6.1. Junction points:

Quanta of matter, with (more or less) equal quantity of matter-content, form latticework-structures, called 2D energy-fields, in space. For explanations below, quanta of matter of equal matter-content are considered. Quanta of matter, when in contact with each other, have a tendency to form 1D quanta-chain extending infinitely. For the time being, we may disregard presence of quanta of matter in perpendicular directions at junctions.

In figure 2.17, 'AO' and 'OB' represent two quanta of matter in a 1D quanta-chain. Let there be another quantum of matter, 'CO_2' in contact with quantum of matter AO in the chain. Affinity, between their matter-contents, moves quantum of matter CO_2 until its end O_2 join common junction O. When a common junction O, as shown in figure 2.18, is formed, quanta of matter AO, BO and CO_2 continue to apparently attract each other so that they may align in one spatial dimension.

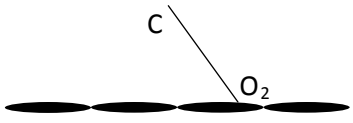

Figure 2.17

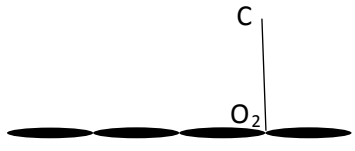

Figure 2.18

Turning movement between two quanta of matter at a junction is inversely proportional to their divergence angle. We may disregard turning movements of quanta of matter AO and BO (on each other, for the time being). Torque, turning quantum of matter CO_2 clockwise due to interaction between matter-contents of quanta of matter AO and CO_2 is greater than turning movement between matter-contents of quanta of matter CO_2 and BO trying to turn quantum of matter CO_2 anti-clockwise. As a result, quantum of matter CO_2 will turn clockwise and settle with its body at equal angular difference from both quanta of matter AO and BO, as shown in figure 2.18.

In this position, turning effort (or torque) on quantum of matter CO_2 by both quanta of matter AO and BO of quanta-chain are equal and opposite in directions. Hence, efforts neutralize each other. If quanta of matter AO and BO of quanta-chain keep their mutual alignment in single spatial dimension, quantum of matter CO settles at right angle to quanta-chain, formed by quanta of matter AO and BO.

While considering turning movements on quanta of matter AO and BO, due to presence of quanta of matter CO_2, turning movements on quantum of matter AO and BO by their outer neighbors in quanta-chain also will have to be taken into consideration.

There will be small angular movements of quanta of matter AO and BO, balanced by reaction from quanta-chain. Quantum of matter CO_2 will remain at its full length until two other quanta of matter join at its ends in its own spatial dimension. When both ends of quantum of matter CO_2 are linked to other quanta of matter in same spatial dimension, affinity between their matter-contents will reduce length of quantum of matter CO_2 also to minimum limit.

Another quantum of matter, in same plane and joining at junction O, lines up itself, again at right angle to quanta of matter AO and BO, but in a straight line with quantum of matter CO_2. Such a junction of four quanta of matter makes turning movements about junction O, in neutral and stable condition. All four quanta of matter at common junction achieve stable states, when their matter-contents are at right angle to each other, as shown by ends of quanta of matter at a junction point in perpendicular quanta-chains in figure 2.19. A junction point may have any number of quanta of matter.

Angular diversions, of quanta of matter at junctions, from their stable position are automatically corrected by aligning efforts between them. As long as angular differences between quanta of matter at a junction differ in magnitudes, all participating quanta of matter remain under stress to return to their stable position. This stress is the result of strain suffered by quanta-chains and causes continuous effort on participating quanta of matter to return to their neutral and stable condition. Stable angular differences between adjacent quanta of matter at a junction point are equal. In this case, their stable positions are mutually at 90° to each other.

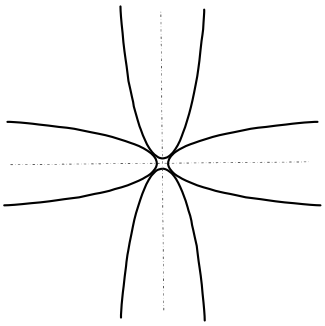

Figure 2.19

Figure 2.19 shows ends of quanta of matter at a junction formed by four quanta of matter. Quanta of matter in horizontal and vertical straight lines are parts of separate quanta-chains. Formation, as shown in figure, prevents direct contact between ends of quanta of matter in a quanta-chain. Instead, they have indirect contact through intermediary quanta of matter. Each quantum of matter at the junction has direct contact only with its neighbors. They do not express end-to-end compression on neighboring quanta of matter in same quanta-chain.

Resultant self-elongating efforts are directed mainly to create angular displacements of their matter-contents. Resultant self-elongating efforts on each quantum of matter, from its neighbors on either side, are in opposite directions. They balance each other when angular differences of major axis of a quantum of matter from major axes of its immediate neighbors on either side are equal. Therefore, quanta of matter at a junction are compelled to maintain equal angular difference between them.

Imbalance in stabilizing efforts changes relative positions of quanta of matter at a junction. As quanta of matter at a junction form a self-stabilizing system, it is their endeavor to maintain relative angular and linear positions of constituent quanta of matter at the junction. In stable position, all self-elongating efforts are at equilibrium. Incessant movements of quanta of matter at a junction, to maintain stability, ensure that points of contact between neighboring quanta of matter are never steady. Unsteady points of contact between neighboring quanta of matter reduce average affinity between their matter-contents and avoid merger.

Figure 2.20 shows a junction O of four quanta of matter, A, B, C and D. In its original condition, quanta of matter A, at position A_1, all quanta of matter at the junction are in their stable condition. We shall consider turning movements on quantum of matter A_1 (when turned through an angle to position A) by quanta of matter B and C. Quantum of matter D, which is also a constituent of the junction, does not make direct contact with quantum of matter A_1. Therefore, there is no direct interaction between their matter-contents.

In their stable relative positions, turning movements due to interactions between matter-contents of quanta of matter A_1 & B and A_1 & C, on quantum of matter A_1 are of magnitude F each, shown by arrows in grey lines. Since these turning movements are of same magnitude and opposite in directions, they neutralize each other. There is no resultant turning action on quantum of matter A, when it is at position A_1.

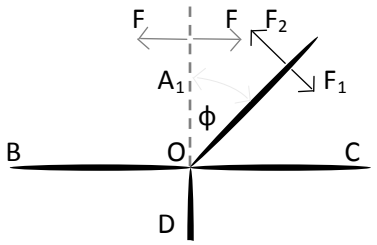

Figure 2.20

Let quantum of matter A is deflected by an angle ϕ to position A, as shown in figure 2.20. Angular difference between quanta of matter A and C is an acute angle. Angular difference between quanta of matter A and C has reduced from 90˚ by angle ϕ. Turning movement between quanta of matter A and C, on quantum of matter A increases correspondingly to F_2, as shown by black arrow. Angular difference between quanta of matter A and D is an obtuse angle. Angular difference between quanta of matter B and A has exceeded 90˚ by angle ϕ. Turning movement between quanta of matter B and A, on quantum of matter A decreases correspondingly to become F_1, as shown by black arrow.

Turning movements F_2 and F_1 are in opposite directions. Resultant of the two turning movements is in the direction of F_2 and it turns quantum of matter A back to its stable position at A_1. Due to deflection of quantum of matter A from its stable position, similar realigning efforts develop between other quanta of matter also, at the junction.

Movement (displacement) of a participating quantum of matter (strain) at a junction is a positive accomplishment. In physical sense, it is a 'work', done by or on quanta of

matter. Theoretically, displacement of quanta of matter at a junction is tangible, sensible and real. Therefore, work is real (action). Stress at the junction, between quanta of matter is always present, even in their stable state. It is their relative angular differences, which produces a resultant effort to move (deflect) any or all quanta of matter at a junction.

We shall consider stable condition at a junction as reference and consider only resultant stress at junctions for all our explanations. All strain and stress associated with stable relative positions of quanta of matter are ignored and their values are neglected for all future considerations. We shall consider only those strain, caused by additional deflections (displacements) of constituent quanta of matter at junctions and associated stress at the junction point as work and energy, respectively.

As long as relative displacements (from their stable positions) between participating quanta of matter at a junction are present, certain work (over and above work invested to bring them to stable configuration) is associated with that junction. Work-done on quanta of matter at a junction is maintained (at junction) as long as quanta of matter remain displaced from their stable relative positions. Displacement of quanta of matter or work-done produces associated (resultant) stress between participating quanta of matter. This additional stress, produced by work (strain) is 'energy' stored at junction of quanta of matter. Additional stress is released and energy stored at the junction is reduced to nil, when participating quanta of matter return to their stable relative positions. In this state, work is undone.

Quanta of matter, meeting at a junction, being part of quanta-chains of their own spatial dimension, are already compressed to their minimum length in 1D spatial system. Magnitude of compression in a quanta-chain is proportional to extent (length) of quanta-chain, in stable state of universal medium.

Widths of quanta of matter in a quanta-chain are increased only by negligible values and they remain within the definition of 1D objects. Usually, quanta of matter in a quanta-chain are at the brink of growing into 2D spatial system. Additional external compression on them, along their axes makes them to grow, for the duration of such compression, into second spatial dimension. Quanta of matter grow in widths by a reduction in their lengths. When compression is removed, they will return to their original states.

2.6.2. 2D energy-field:

No quantum of matter can remain in third spatial dimension (in space) and link with junctions, formed by quanta of matter. Second-spatial dimension is common to all quanta of matter meeting at a junction. Plane of their existence defines second-spatial dimension for quanta of matter at any junction. A latticework-structure, formed by arrangements of quanta-chains, as a whole, can act only in its own two-dimensional spatial system. Since

this 2D latticework-structure is considered to store and deliver functional entity of 'energy' for all inertial actions, it may be called a '2D energy-field**'**. Since each latticework-structure occupies only one plane in 3D space it is qualified as two-dimensional. It is called a 'field' because each 2D energy-field represents an expanse of space in its plane. Energy is (currently) an undefined and imaginary entity that is used for all sundry purposes, to indicate cause and result of an action. It has no physical existence or form. However, energy is intricately associated with every form of action, without exhibiting its physical presence. As 2D energy-field provides a logical home of existence to this hitherto undefined entity, the word 'energy' is included in its name.

Let us consider a free quantum of matter, making contact with another quantum of matter, which is already a part of a junction or a quanta-chain. Although a quantum of matter at a junction is a 1D object, it has certain negligible width. On making contact, free quantum of matter also is influenced, by self-adhesion of their matter-contents. Free quantum of matter develops its negligible width in same plane as that of quanta of matter at junction-point in quanta-chain. As a result, a latticework-structure of quanta of matter, forming a 2D energy-field, can exist only in one plane.

It should also be noted that, in our 3D spatial system, a 2D object has no thickness. Any number of 2D objects stacked parallel and on top of other, cannot increase total thickness of the stack from being negligible or zero. It is only logical to think that many parallel planes, stacked on top of other, are bound to make a volumetric space even if number of planes reaches infinite proportions. Therefore, because of negligible but positive thickness of planes (as considered here), large number of adjacent and parallel 2D energy-fields occupies volumetric space.

Given enough quanta of matter and time, they will form 2D energy-fields in every possible plane in space. Since entire space is filled by matter, this concept considers that entire space is filled with infinite number of 2D energy-fields and 3D matter-particle in them. For this, all parallel planes (in every direction) also need to have their own 2D energy-fields. Having 2D energy-fields in all parallel planes increases thickness of space occupied by them. Consequently, it is logical to think that each 2D energy-field and its plane have certain thickness.

Development of 2D energy-field is a natural process. 2D energy-fields can be formed in all adjacent planes. However, because of their physical independence and individuality, two 2D energy-fields do not interact (directly) even if they are touching (crossing) each other. Distance or separation between two adjacent and parallel 2D energy-fields corresponds to the thickness of a plane or a 2D energy-field in 3D spatial system. Magnitude of this thickness has to be a positive value. A plane with zero thickness or negative thickness is a non-entity. Similar 2D energy-fields, extending to infinity, exist in

all possible planes of 3D space. Therefore, number of 2D energy-fields in a given volume of 3D space cannot be determined with reference to 3D spatial system.

Figure 2.21 shows quanta of matter in a number of junctions together forming part of latticework (or mesh-like network) structure of a 2D energy-field in a plane. Since constituent quanta of matter of stable latticework-structure of 2D energy-field have almost equal quantity of matter-content, they are of equal lengths. Hence, quanta of matter in 2D energy-field can also be regarded as forming sides of geometrical squares in latticework-structure. These are referred as latticework-squares.

Each of 2D energy-fields extends infinitely in both spatial dimensions of space in every plane in 3D space. Movements of constituent quanta of matter in latticework-structure of a 2D energy-field or any action by or on them can take place only in the plane containing the 2D energy-field and through the medium of latticework-structure of 2D energy-field in that plane. Entire space in universe (and beyond, if it can be said) is filled with 2D energy-fields and quanta of matter in this manner. 2D energy-fields (and their constituent quanta of matter) in different planes that are intersecting each other co-exist without mutual hindrance.

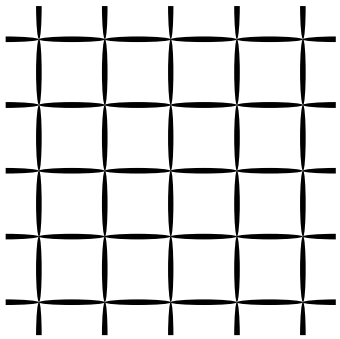

Figure 2.21

Non-interference of neighboring 2D energy-fields in parallel planes requires that these 2D energy-fields should not be in contact. This essentially needs a gap between two adjacent parallel 2D energy-fields. 2D energy-fields in all other possible directions and planes have their constituent quanta of matter to fill gap between two adjacent parallel 2D energy-fields. Ability of quanta of matter to coexist helps formation of 2D energy-fields in all planes without interfering with 2D energy-fields in any plane. This phenomenon helps latticework-structures by quanta of matter to fill entire space without empty space.

Entire space is filled with 2D energy-fields, constituted by quanta of matter. Attempts to determine total matter-content or matter-density in any part of space should take these factors also into consideration. Because; quanta of matter are foundational matter-particles (in their functional state) and all matter-particles have matter-contents, however small it may be. [Tern ‘mass’ may represent matter-content of a matter-body that can be moved by an external effort. Hence, it may not be applicable to quanta of matter in their functional states]. This part of matter, in its functional state and invisible to us (the 3D beings) may constitute ‘Dark matter’ in our universe. Here, magnitude of dark matter is in relation to the total ‘visible’ matter-content existing in the universe. It is not related to gravitational actions required to determine any assumed state the universe.

We are part of a 3D world. We are unable, by our senses, to perceive anything but 3D matter as real. A quantum of matter becomes real, in our sense, only when it starts to grow into third spatial dimension and form 3D matter. As far as our senses are concerned, quanta of matter in their 1D and 2D spatial states and hence all 2D energy-fields and free-floating quanta of matter therein, may be considered as functional or ethereal matter than real matter. They are not virtual or imaginary. They are considered to be functional, only because of our inability to detect their physical presence in their 1D and 2D spatial states. Our present instruments and measurements are not suitable for 1D and 2D entities. They will become suitable only when we will be able to define thickness of a plane or breadth and thickness of a line in terms of our measuring units.

Only 2D energy fields, formed by latticework-squares (by perpendicular quanta-chains) can provide an ideal universal medium. They have the required rigidity, stability and flexibility to perform all actions expected from an ideal universal medium. Formation of 2D energy-fields and junctions in their latticework-structures are also possible with six quanta of matter making up every junction and a latticework-structure formed by equilateral triangles. 'Energy field' or part of it, formed thus, is rigid and transmission of actions through them is nearly impossible. Such energy fields, being rigid, tend to prevent transmission of efforts or movements of quanta of matter in them.

Passage of basic 3D matter-particles through rigid part parts of 2D energy-fields (formed by equilateral triangles) breaks it down to free its constituent quanta of matter, which may then regroup and form part of squares of latticework-structure in a 2D energy-field. Space has plenty of moving basic 3D matter-particles to accomplice this in a short time. However, due to slow and gradual actions during formation or restoration of part of latticework-structure of a 2D energy-field, it is more probable for quanta of matter to form latticework-structures with squares rather than triangles in them.

Part of a 2D energy-field, with higher number of quanta of matter at its junctions; gradually convert itself into more stable form of 2D energy-field with junctions having four quanta of matter, each. 2D energy-fields are self-sustaining entities. They tend to maintain their homogeneity and isotropy.

2.6.3. Equilibrium of 2D energy-field:

Stable 2D energy-fields (or their parts) are formed by quanta of matter of equal matter-contents. Quanta of matter, which differ from average size, as part of a 2D energy-field, produce uneven latticework-squares in their latticework-structures. Such parts of 2D energy-fields are not in stable condition. If unevenness is large, offending quantum of matter is shifted along latticework-structure until it, in conjunction with other similar quanta of matter, tends to create a disturbance in 2D energy-field.

For stable part of 2D energy-field to be in balance within itself, each constituent quantum of matter should form side of a perfect square in its latticework-structure. (Hence, the name latticework-squares, though when under strained condition they are more like parallelograms or other geometrical forms with straight sides). In stable condition of 2D energy-field, all moving tendencies (stress) on quanta of matter neutralize each other and 2D energy-field, as a whole, becomes isotropic and homogeneous. This state of equilibrium is self-sustaining and it is the endeavor of every 2D energy-field to maintain this state of serenity. This characteristic property of 2D energy-fields is the cause of all efforts, actions and (apparent) interactions in nature.

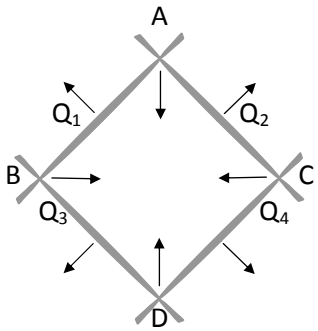

Figure 2.22

Figure 2.22 shows one square in latticework-structure of 2D energy-field. 'Q_1', 'Q_2', 'Q_3' and 'Q_4' are four quanta of matter of equal matter-content, forming the square. A, B, C and D are junction-points to which these quanta of matter are attached. Although turning movements on participating quanta of matter are acting at junctions, these actions may be represented by apparent efforts within each of squares in latticework-structure. In equilibrium state, all apparent efforts within latticework-square are in balance and there is no resultant effort in any direction. Opposite corners 'A' & 'D' and 'B' & 'C' may be considered as attracting each other. Similarly, opposite sides of latticework-square may be regarded as repelling each other. From the figure, it can be seen that all these efforts, shown by arrows, being equal and opposite, neutralize each other and the square in latticework-structure of 2D energy-field remains in stable state.

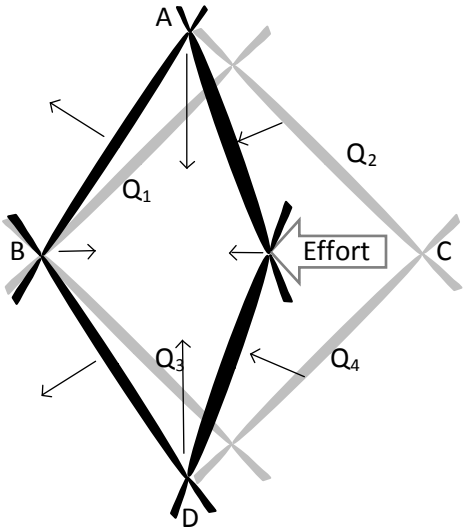

Figure 2.23

In figure 2.23, relative positions of quanta of matter, in stable 2D energy-field, are shown in grey. Let there be an (hypothetical) external effort on junction C of quanta of matter Q_2 and Q_4 of a latticework-square, as shown by block arrow. (All efforts are applied through the medium of 2D energy-field only. Direction of an effort is controlled by relative magnitudes of movements of quanta of matter at junctions in latticework-

structures of 2D energy-fields. Here, for explanation, we are assuming an independent and hypothetical effort, in the direction shown by block arrow, acting through empty space on latticework-square).

External effort has components in opposition to existing repulsions on arms AC and CD of square in latticework-structure and thus reduces apparent repulsions on these arms. These actions also may be regarded as assisting apparent attraction between corners B and C of square in latticework-structure. Assume corner B is held steady. Side AC will turn about corner A and side CD will turn about corner D. Relative positions of constituent quanta of matter are shown in black. Angular movements of quanta of matter AC and CD bring corners B and C nearer and take corners A and D farther. Angles A and D decrease and angles B and C increase.

Changes in divergence angles between quanta of matter of square in latticework-structure give rise to increased stress in quanta of matter at junctions and thus, produce resultant reactions. Directions of resultant of reactions are in direct opposition to the applied effort and act in such a way as to restore equilibrium of square in latticework-structure. Arms of a deformed square in latticework-structure remain under stress (at their junctions) as long as latticework-square remains deformed. Stress, produced by deformation of square in latticework-structure, acts as its desire to return to its stable state.

Other junction-points A, B and D (with the help of quanta of matter and junctions beyond them) restrict mechanical deformation of square in latticework-structure. These junction-points are also shared by other quanta of matter in latticework-structure beyond the square, considered. Reactions from these quanta of matter restrict free displacement of junction-points.

Restrictions appear as compressions or tensions on quanta of matter of latticework-square. These, in turn, pressurize respective quanta of matter to grow temporarily into second spatial dimension or reduce compression from their ends to elongate them further. Thus, part of external effort is used to convert quanta of matter into second spatial dimension and stress or energy is stored in matter-contents of quanta of matter in the form of pressure energy, producing changes in their spatial dimensional states. As and when it is possible, pressure energy stored in matter-contents is returned by quanta of matter, while regaining their original stable states.

Work, put in by external effort, is stored in the form of reduced length (pressure energy) in quanta of matter to change their spatial dimensional status and in the form of relative displacement of quanta of matter within latticework-structure. These two, together constitute ‘work-done’ by external effort. Because of latticework-structure of 2D energy-field, work-done in any part of it cannot remain isolated or permanent, unless it

can be maintained by external means. In free space, distortions in latticework-structure tend to spread out in 2D energy-field.

Under extreme conditions, deformation in 2D energy-field may be large enough, so that some of the junctions of quanta of matter in it may be compelled to accommodate more quanta of matter or abandon available quanta of matter to form additional rectangles or triangles in latticework-structure, to prevent its breakdown. Such additional formations remain under stress and equilibrium can be restored only when stress caused by such formations and distortions due to them are removed from latticework-structure.

If deforming efforts are too great, squares in latticework-structure of 2D energy-field may break down (locally) and release constituent quanta of matter to be free in space. Magnitude of local break down in 2D energy-field depends on 'power' (temporal rate) of work input.

Consider a square in latticework-structure of a 2D energy-field, as shown in figure 2.22. Consider junction B is prevented from moving and junction C is displaced towards junction B. External efforts, transmitted through quanta of matter Q_2 and Q_4, cause outward displacement of junctions A and D. Magnitude of displacement of each of these junctions is proportional to cosine of angle between line joining B & C and respective quantum of matter.

If junctions A and D of latticework-square are prevented from moving, junction B imitates displacement of junction C (latticework-square behaves like a rigid object).

If junctions A, B and D are prevented from moving, attempt to displace junction C to left produce compression of all quanta of matter in latticework-square. Behavior of latticework-square is exactly as fluid object behaves under external effort.

Hence, 2D energy-field, though it is made up of seemingly solid and rigid foundational matter-particles, behaves like an ideal fluid body. In reality, only macro bodies can exist in various physical states. In case of 2D energy-fields, solid and fluid states are mentioned to describe their properties rather than their physical states.

2.6.4. Properties of 2D energy-fields:

2D energy-fields are made of 1D quanta of matter in latticework formation. Infinite number of quanta of matter form infinite number of 2D energy-fields. No two 2D energy-fields can occupy same plane. 2D energy-fields, in all possible planes (directions), fill entire space, outside basic 3D matter-particles. Formation and characteristic properties of 2D energy-fields are result of interactions between structure-less matter-contents of constituent quanta of matter, in contact. 2D energy-fields exist everywhere (outside basic 3D matter-particles) and every thing else exist within 2D energy-fields. 2D energy-fields in all possible planes in space, together, constitute all-encompassing 'universal medium'.

Latticework-structures of 2D energy-fields endow them with characteristic properties of both solid and fluid, simultaneously. Rigidity of quanta of matter, with regard to bending or shearing movements, bestows a 2D energy-fields with its solid property. Fluency and compressibility of latticework formation bestow a 2D energy-field with its fluid property. Latticework-structure of a 2D energy-field makes it elastic and resilient, up to a limit, able to absorb movements (strain) of any part and to pass it on along 2D energy-field.

Once a junction is formed, by at least two quanta of matter, further additions of quanta of matter to the junction can take place only in 2D spatial system, formed by first two quanta of matter. Quanta of matter at a junction can apply (reactive) effort or move themselves only in the 2D spatial system, defined by first two quanta of matter, which initiated development of junction. All their future interactions with other quanta of matter can take place only in this plane. Subsequent additions of quanta of matter to this junction also have to conform to its 2D spatial system. Therefore, quanta of matter cannot form energy fields in any higher-dimensional spatial system, other than 2D spatial system.

Formations of 2D energy-fields, mentioned above, are only hypothetical cases, because no new 2D energy-field can ever be formed in nature. 2D energy-fields already fill entire space and no additional 2D energy-field can ever be formed within this space. They are always present and are forever. Above description on formation and development of 2D energy-fields is described only to understand local breakdowns and rebuilding of 2D energy-fields and their actions during stabilization.

2D energy-fields have no beginning or end, in both extent and time. They are infinitely vast and have perpetual existence. Everything real, in nature, is created out of and by 2D energy-fields. 2D energy-fields are the basis of all actions and apparent interactions in nature. They create, provide for, sustain and ultimately destroy every physical (3D) object in universe. All types of energies are originated, stored, transmitted and dispersed through and by 2D energy-fields. 2D energy-fields have the following inherent properties, derived from properties of their constituent quanta of matter:

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 2D material entities made of 1D 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 have perpetual existence. No new 2D energy-field is ever produced. On the whole, 2D energy-fields are steady in space. They provide an absolute reference.

4. 2D energy-fields fill the entire space outside basic 3D matter-particles. Each 2D energy-field extends indefinitely in all directions in its plane. Since there are no voids (or limits to extents of 2D energy-fields), no 3D matter-particle can exist outside 2D energy-fields. They pervade all inter-particle spaces in macro bodies.
5. 2D energy-fields in different planes, passing through same point in space, co-exist at that point.
6. Quanta of matter, in a 2D energy-field, are held under compression from their ends, in quanta-chains situated in perpendicular directions to each other and crossing at junction-points between quanta of matter.
7. 2D energy-fields are self-sustaining entities. They strive to sustain their integrity, stability, homogeneity, isotropy and serenity. Each 2D energy-field has adhesion within itself and tends to maintain its continuity in the plane of its existence.
8. In stable state of a 2D energy-field, constituent quanta of matter form sides of perfect squares in its latticework-structure. Change from its stable state produces restoring reaction in latticework-structure.
9. Interactions between two points in a 2D energy-field are confined to the plane containing both 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 have 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.
10. 2D energy-fields tend to reduce disturbances in them to a minimum, either by reducing their sizes by shaping them circular and compressing to smaller size and / or by ejecting disturbances from the location of their creation.
11. All higher-dimensional spatial systems exist within 2D energy-fields and all higher-dimensional matter-particles are ‘disturbances’ with respect to 2D energy-fields. Disturbances are contained within gaps in fabrics of 2D energy-fields.
12. All basic 3D matter-particles are created from, sustained by and reverted back into the 2D energy-fields.
13. 2D energy-fields provide an all encompassing universal medium for all 3D matter-bodies and for apparent interactions between them.
14. Region of 2D energy-fields, about a 3D matter-body, store associated work in the form of distortions (and energy in the form of stress due to distortions) to sustain integrity and stability of the 3D matter-body and its current state (of motion).
15. Distortions (work-done and corresponding efforts) in two 2D energy-fields cannot interact. Transfer of distortions or interactions between distortion-fields are limited to plane of each 2D energy-field. Simultaneous actions in many planes appear as an action in 3D spatial system.
16. Basic 3D matter-particles are displaced in space by transfer of distortions in steady 2D energy-fields. Absolute motions of 3D matter-bodies are with respect to steady 2D

energy-fields. 3D matter-bodies are moved by 2D energy-fields rather than they move through 2D energy-fields.

17. Tendency of 2D energy-fields, to close-in on any gap in them, produces phenomena of gravitation.
18. Latticework-structure of a 2D energy-field causes sequential development of distortions in neighboring latticework-squares. Distortions, once developed, remain permanently within 2D energy-field, unless removed by external action. These phenomena give rise to the property of inertia.

2D energy-fields are formed from quanta of matter by a definite mechanism. Since 2D energy-fields fill entire space, their constituent quanta of matter fill entire space, outside basic 3D matter-particles. 2D energy-fields have all the required properties given in above paragraphs, describing an ideal medium. 2D energy-field is a real 'material object' and an ideal all-pervading universal medium that can be substituted for space or different types of aether in 'aether theories'.

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

2D energy-field is inherently under compression. Availability of free quanta of matter and frequent local breakdowns of its latticework-structure provide many opportunities for quanta of matter to infiltrate into latticework-structures of 2D energy-fields. Frequent migration of free quanta of matter into structure of 2D energy-fields, keep universal medium under compression even without a definite border (container).

Being the only type of occupants of space, except basic 3D matter-particles, 2D energy-fields have to create basic 3D matter-particles from and by themselves. It also has to maintain stability and integrity of all basic 3D matter-particles and superior matter-bodies created. (Apparent) interactions by help of 2D energy-fields, combine and group basic 3D matter-particles to form diverse fundamental particles and larger macro bodies.

2.6.5. Homogeneity of universal medium:

In 3D worldview, no two independent 3D matter-bodies can simultaneously occupy same location in space. Therefore, if we consider quanta of matter as 3D matter-bodies, however close constituent quanta of matter of latticework-structures are packed, there are bound to be gaps in universal medium. In strict sense, gaps within latticework-squares

and between adjacent parallel 2D energy-fields make them heterogeneous. This cannot be tolerated in a homogeneous universal medium. Matter-density of universal medium should be identical everywhere in space, a requirement that precludes gaps in it.

This conundrum is overcome by universal medium's structure by quanta of matter in their lower spatial dimensional states. In these states, two quanta of matter (in different planes) are able to coexist in same location in space without interfering with each other's existence. This phenomenon prevents existence of gaps or voids between quanta of matter, forming universal medium or between different 2D energy-fields. Ability to coexist enables quanta of matter in different directions to fill entire space (outside basic 3D matter-particles) and form a homogeneous universal medium. We can say that heterogeneous 2D energy-fields combine to form homogeneous universal medium.

Quanta of matter, in their 3D states, form basic 3D matter-particles. Matter-densities of quanta of matter are same, irrespective of their spatial states. Therefore, matter-densities of basic 3D matter-particles and universal medium are same. Universal medium exists outside basic 3D matter-particles. Matter-density is equal everywhere in space (in basic 3D matter-particles as well as in universal medium). As far as matter-density is concerned, whole matter (in different spatial dimensions) in universe, exists as a single block of matter of uniform consistency. Matter-density of entire space (including that of basic 3D matter-particles) is same as matter-density of a quantum of matter or that of a basic 3D matter-particle. This matter-density is constant throughout universal medium (space). Consequently, universal medium is homogeneous in its consistency.

Due to 2D latticework-structures of universal medium, matter-density, when considered separately for any plane, shows much larger gaps between quanta of matter in that plane (spatial dimension). Space between quanta of matter forming squares of latticework-structure has no presence of matter in its spatial dimension.

2.6.6. Anisotropy of universal medium:

Universal medium (structured by quanta of matter), in its stable state, is homogeneous, isotropic and serene. A homogeneous and isotropic universal medium cannot deform nor have relative motions within its structure. If universal medium cannot have relative displacement of its parts, it can neither act nor be acted upon on or by other entities. Therefore, it is imperative that structure of universal medium (which has isotropic properties in its stable state) should be able to cater for anisotropic properties during its unstable conditions, while remaining homogeneous. Entire space is occupied by matter. Although they are able to coexist, matter-contents of different quanta of matter do not overlap or superimpose.

Latticework-structures of 2D energy-fields are formed by grids in geometrical shapes of squares [like; mesh formed by sets of parallel straight lines, perpendicular to each

other], each side of a square is provided by a quantum of matter. Because of this latticework-structure, in each plane, spaces within latticework-squares are free from matter-content in that plane. However, such gaps in the plane (or any probable gap between two quanta of matter in same spatial dimension) are occupied by quanta of matter in other spatial dimensions. This arrangement leaves no room for void or empty gap in space. At the same time, structure of each 2D energy-field has ample gaps within each of its latticework-square. Junctions of quanta of matter in 2D energy-field are not rigid. This helps a 2D energy-field to deform within certain limits without affecting matter-density or homogeneity of universal medium.

A distorted 2D energy-field may not be homogeneous, in itself, but gaps within its latticework-structure are always filled (without voids) by other 2D energy-fields. Combination of 2D energy-fields form universal medium. Matter-density or homogeneity of universal medium do not change even if all 2D energy-fields in a region of universal medium are distorted. Individual 2D energy-fields may become anisotropic without disturbing homogeneity of universal medium, as a whole.

2.6.7. Relative motion in universal medium:

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

In each plane, latticework-structures of 2D energy-fields leave lot of space around their constituent quanta of matter, for their relative displacements. At the same time, bonds between quanta of matter in latticework-structures of universal medium are weak enough to allow angular displacement or departure between quanta of matter at junction-points. This facilitates relative angular displacement between quanta of matter in a 2D energy-field. Latticework-structures may be deformed and/or parted to facilitate motion and passage of basic 3D matter-particles through them.

Latticework-structure enable universal medium to transfer deformations in it, even without presence of basic 3D matter-particles. Actions and deformations in all 2D energy-fields about a point in space, together, appear as action in 3D spatial system. This arrangement of 2D energy-fields distribute matter evenly throughout entire space and at the same time make 2D energy-fields free to deform without damaging homogeneity (constant matter-density) of universal medium. Displacements of one or more quanta of matter (in any spatial dimensions) do not leave space occupied by them, empty. As same space is simultaneously occupied by quanta of matter in other spatial dimensions, no

empty space or void appear in these places, vacated due to displacement of quanta of matter.

2.7. Distortions:

Latticework-structure and flaccid bonds by quanta of matter at their junctions allow 2D energy-fields to deform easily. If magnitudes of deformations exceed certain limit, junctions of quanta of matter may give way to accommodate more or less numbers of quanta of matter to avoid local breakdown of latticework-structures of 2D energy-fields. Deformations in 2D energy-fields may be called 'distortions'. A region in universal medium or in individual 2D energy-field with deformed latticework-structures may be called a 'distortion-field'.

If magnitude of distortions in latticework-structure of a 2D energy-field exceeds maximum stabilizing effort (reaction) that can be generated by latticework-structure, it will locally breakdown and create a gap, temporarily in the plane of 2D energy-field. Even during this event, gap formed in that particular 2D energy-field is occupied by 2D energy-fields in various other planes, which avoid creation of void in the gap.

Distortions are nothing but deformations of latticework-structures of 2D energy-fields in a region of universal medium. Distortions may be caused either by displacements or changes in spatial dimensions (or both) of quanta of matter in their latticework-structures. Displacements and changes in spatial dimensions of quanta of matter in latticework-structures are work. Hence, distortions in universal medium are work-done in universal medium.

Distortions in latticework-structures of 2D energy-fields have general directional properties. Depending on the nature of directions of distortions, they may be classified into various types. However, to create a distortion in a latticework structure of 2D energy-field, all its constituent quanta of matter do not displace in same direction. If they move in same fashion or direction, no distortion will be created in latticework-structure. Distortion essentially requires relative displacements of quanta of matter in a latticework-structure. Therefore, if we consider work-done on individual quanta of matter, they will be in various directions and no uniformity will appear.

Hence, total stress produced in latticework-structures due to certain distortion may be considered as equivalent to average work, done in that region of universal medium. Work is a tangible and real entity and stress is functional entity. They closely related. For practical reasons, it is more convenient to measure work in terms of stress in latticework-structure than averaging individual displacements of quanta of matter. Therefore, although stress and work, associated with a distortion, are measured in same measurement scale. Stress, produced in universal medium, is the energy associated with the work invested to create the associated distortion.

Depending on orientation of latticework-structure of 2D energy-field, it can be distorted either by linear displacement of quanta- chains or by diagonal collapse of latticework-squares or combination of both types of deformations. Distortions by linear displacement of quanta-chains deform latticework-structure by variations in lengths (and breadths) of its constituent quanta of matter. In this case, work is done by compressing quanta of matter along their lengths and it is stored as pressure energy in quanta of matter. Distortions by diagonal collapse of latticework-squares deform latticework-structure by angular displacements of its constituent quanta of matter. In this case, work is done by changing relative orientations of quanta of matter at their junctions and it is stored as stress at junction of quanta of matter.

2.7.1. Reactive effort:

Once a 2D energy-field is formed, it tends to maintain its continuity and stability. To move a quantum of matter within or detach one quantum of matter from latticework-structure of a 2D energy-field requires effort and certain work has to be done by its displacement. An attempt to move a quantum of matter, which is part of latticework-structure of a 2D energy-field, is opposed by aligning efforts between quanta of matter in latticework-structure. Magnitude of opposing effort is just sufficient to prevent or to restore movement of quantum of matter within latticework-structure of 2D energy-field. This is 'reactive effort ' or reaction by universal medium that opposes external effort (for time being, imagined as being applied directly on to a quantum of matter), instrumental to displacement of quantum of matter.

Quantum of matter can be moved or displaced only if external effort can overcome opposing reactive effort from universal medium. Displacement of quanta of matter within latticework-structure of a 2D energy-field is 'work-done'. Work includes distortions caused by changes in dimensional status of quanta of matter as well as their displacements.

If a quantum of matter is removed from a 2D energy-field, its place in latticework-structure becomes vacant. Due to break, adjacent quanta of matter in quanta-chains on either side of gap within 2D energy-field, become ends of quanta-chains in same spatial dimension. There are no compressions on them from their ends towards the gap. Parts of quanta-chain, on either side of gap, are now free to grow in length, into gap in latticework-structure. They can move only by moving other quanta of matter of same junction-points, which are at right angle to direction of such growth.

Movements of a junction-point are restricted by stability of other junctions to which they are part of. Hence, growth in lengths by quanta of matter into gap is accomplished against reaction from quanta of matter, which are placed at right angles to them in latticework-structure. Correspondingly, quanta of matter situated at right angles to

direction of movement of quanta-chains are turned angularly to facilitate displacement of junctions towards the gap.

Growth of quanta of matter, on either side of a gap, into the gap, reduces compression on other quanta of matter in quanta-chains in same spatial dimension, letting them also to elongate. Infinite extent of quanta-chain, restrict elongation of quanta of matter in quanta-chains by applying reaction at every junction along the length of quanta-chain.

Figure 2.24 shows part of latticework-structure of a 2D energy-field with a quantum of matter between junctions A and B missing. Probable distortions in latticework-structure are as shown in figure. Displacements of quanta of matter and magnitudes of their widths, shown in figure, are highly exaggerated. All quanta of matter, which come under compression from ends, temporarily grow into second spatial dimension. All those quanta of matter, on which compression from quanta-chain are reduced, shrink into their first spatial dimension and further reduce their 'negligible' width. Widths of lines in figure indicate widths of quanta of matter, corresponding to compression on them.

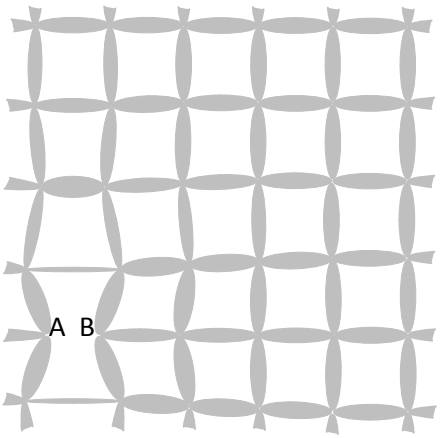

Figure 2.24

Gap, formed in a 2D energy-field, introduces certain strain of all quanta of matter in neighborhood and corresponding stress in 2D energy-field, until one quantum of matter from quanta-chain in same spatial dimension, slips into vacant place to restore continuity of latticework-structure of 2D energy-field. Now another place in latticework-structure has become vacant. Above-described process repeats along quanta-chain, indefinitely, until continuity of latticework-structure of 2D energy-field is fully restored. This process is completed only when a free quantum of matter or a corresponding gap in latticework-structure of 2D energy-field is found somewhere along the direction of transfer of quanta of matter.

When a free quantum of matter is introduced into latticework-structure of a 2D energy-field, in its spatial dimension, it produces stress in the 2D energy-field until it is absorbed and made a part of the 2D energy-field. Since free-floating quanta of matter are not always available in space, this can take place only when a quantum of matter detaches itself from a basic 3D matter-particle and finds itself free in a 2D energy-field.

Newly freed quantum of matter, being a part of a basic 3D matter-particle, at the instant of its liberation, is itself a 3D object. Its magnitude, in first spatial dimension

(length), is extremely small compared to other quanta of matter in latticework-structure of 2D energy-field. Therefore, there is no possibility of a quantum of matter longer than diagonal of a square in latticework-structure being introduced into a 2D energy-field.

Free quantum of matter starts its interaction with any quantum of matter it encounters, first, in its own 2D spatial system. From then onwards, all its interactions and movements are limited within the 2D plane, where it has established contact with other quantum of matter (that is constituent of a 2D energy-field).

A free quantum of matter, in the plane of a 2D energy-field, immediately starts to grow in its first spatial dimension as other spatial dimensions reduce and disappear. Quantum of matter continues to grow in length until both of its ends meet quanta of matter in latticework-structure of one 2D energy-field. First contact by one of its ends determines the plane (2D energy-field) for all its future actions. Once the meeting takes place, ends of free quantum of matter move to nearest junction. Since this quantum of matter cannot attach itself to a junction and be parallel to another quantum of matter, it will find itself in diagonal position within one square of latticework-structure of a 2D energy-field. Both of diagonal junctions now have an additional quantum of matter each, in them.

Presence of additional quantum of matter at a junction, in a 2D energy-field, produces stress in latticework-structure and ultimately causes any one of the junctions to breakdown. One of original quanta of matter, at the junction, breaks away from junction and moves to accommodate newcomer in its place. Only an angular movement of quantum of matter is required for this.

Quantum of matter, which has broken away from junction, now becomes a free quantum of matter, to repeat same process of migration to next junction. These actions continue sequentially until continuity and stability of 2D energy-field is restored. Impetus, required for this migratory movement, is derived from motion of first quantum of matter, which joined the latticework-structure of 2D energy-field, in free state.

Reactive efforts due to both kinds of distortions, mentioned in last sub-section are similar. However, it is much easier to visualize actions and reactions in distortions by diagonal collapse of latticework-squares, all actions and reactions by latticework-structures of 2D energy-fields are explained with respect to distortions by diagonal collapse of latticework-structures. Distortions by linear displacements of quanta-chains are usually ignored. Where, certain physical phenomena are related more to either type of distortions, explanations concentrate on that type of distortion.

2.7.2. Field-effort:

Junctions of latticework-structure of a 2D energy-field, formed with more or less than four quanta of matter and junctions with angular difference between adjacent quanta of

matter differing from 90° are unstable. They introduce additional stress in all participating quanta of matter at unstable junctions. Actions of reactive efforts due to this stress are such as to restore relative positions of quanta of matter at junctions to their stable and natural arrangement.

Magnitudes of reactive efforts, by quanta of matter, to restore their stable state are proportional to angular difference between their present states and their stable states. In other words, it can be stated that motion of a quantum of matter in relation to its neighbors in latticework-structure of a 2D energy-field produces reaction or reactive effort. Reactions to deformations in latticework-structures of 2D energy-fields tend to restore their stable states. This is accomplished by transferring distortions or rearranging quanta on matter in their latticework-structures.

Basic 3D matter-particles exist within gaps in 2D energy-fields but they are not part of their latticework-structures. While restoring stability, 2D energy-fields may displace basic 3D matter-particles in the region along with distortions in their latticework-structures. Displacements of basic 3D matter-particles can be attributed to reactive efforts in 2D energy-fields. Reactive effort, produced by distorted latticework-structures of 2D energy-fields is the basis of all kinds of efforts in nature. Since stabilizing reactive efforts are derived from (distorted) 2D energy-fields, they may be called ‘field efforts’ (currently called field forces).

Field-efforts, in different perspectives, are understood in various forms and considered as separate types of ‘natural forces’. ‘Natural forces’ are currently segregated into gravitational, electric, magnetic and nuclear ‘forces’. There are also other derived ‘forces’, like; inertial, mechanical, potential, kinetic, etc. ‘forces’. These ‘forces’ are synonymous and are interchangeable in many cases. It is the nature of their actions and associations, which differentiates them into different types of ‘natural and derived forces’, as understood presently.

For easier explanation, nature of quanta of matter and their interactions, as explained above, may be rephrased. Each quantum of matter may be considered as a 1D matter-body with two ends. As part of a 2D energy-field, its body can accommodate elongation under tension. Under compression from ends, its length may be reduced, by its matter-content growing into second spatial dimension (width). Ends of different quanta of matter ‘attract’ each other and their bodies ‘repel’ each other, in the same 2D plane. (Refer paragraph 2.6.3). Repulsion between their bodies is only apparent and is the result of (apparent) attraction at their ends, which tend to align quanta of matter in contact, to each other.

However, it should be clearly understood that in reality, quanta of matter cannot act through empty space and can attract only (matter-content of) other quanta of matter,

which are in direct contact. (Apparent) 'repulsion' between their bodies is the result of 'attraction' between their matter-contents through their ends, when in contact.

Assuming above given apparent properties (for quanta of matter), it can be seen that when they form squares of latticework-structure of a 2D energy-field, opposite sides of a square appear to repel each other and opposite corners of a square of latticework-structure appear to attract each other. An external effort (considered as a separate entity), acting on a quantum of matter at a junction, moves it in relation to other quanta of matter in latticework-structure. Since every quantum of matter in latticework-structure of a 2D energy-field, is connected to others through junctions, displacement of any one of them moves all neighboring quanta of matter. Relative movements produce angular differences between quanta of matter at their junctions, which in turn produce reaction due to strain in latticework-structure of 2D energy-field.

2.7.3. Work and effort:

If action and reaction to it do not balance, system breaks down. As soon as action exceeds reaction, certain permanent work is done in the system. Similarly, if reaction exceeds action, certain permanent work is done in the system (in opposite direction). Action and reaction are causes of work and work is the result of either action or reaction. Action and reaction are of opposite nature and they may replace each other in relative considerations.

Permanent work remains with the system, in the form of changes in its state (of motion), until it is removed by another work, done in opposite direction by another action. Hence, a change in state of a system is 'work-done' or work. Change in state of a system is usually observable and tangible. Observable and tangible entities are real or physical. Hence, work is a real entity. It is the (average) magnitude of distortions in latticework-structure of 2D energy-fields in a region (outside and about basic 3D matter-particles in a 3D matter-body).

As long as an action continues to overcome reaction, work continues to be done. Work-done is proportional to magnitude of action and duration of action. If reaction equals a continuing action, no further work is done. Effort to do more work is present in the system but it is neutralized or balanced by equal reaction. Any work-done in a system is maintained steady until it is modified by another action.

Magnitude of reaction, produced in a stable system of 2D energy-field, is proportional to strain in its latticework-structure (destabilizing action) and ceases on removal of distortion (cause of the reaction) in it. This gives rise to the axiom that *"all actions (forces) have equal and opposite reaction"*. Reaction, trying to restore equilibrium of latticework-structure of 2D energy-field also produce work, but in opposite direction to existing work. Newly introduced work, by reaction, tends to undo as much work-done by action as

possible. A distorted 2D energy-field, due to inherent property of its latticework-structure to remain homogeneous and isotropic, disperses distortion in it unless such dispersion is prevented by external mechanism.

Work is always related to certain motion or displacement. Rate of work-done with respect to the displacement is 'force'. When work is related to time, its rate is 'power'. A force may be understood as the rate of production or release of distortions in latticework-structures of 2D energy-fields, with respect to distance moved by a 3D matter-body (in unit time). It is a mathematical relation. Relations are functional entities. Force is a functional entity, which gives the rate of change in magnitude of work-done with respect to distance moved by a 3D matter-body in unit time. Since force is a functional entity, in describing relation between two entities, it has no real existence and it can neither act nor be acted upon physically.

However, currently, force is understood, as a general cause of an action. In reality, force shows relation between work and distance, both of which are real entities. Distance is separation between two points in space. It is tangible and real. Work is the result of an action. It measures deformations in latticework-structures of 2D energy-fields. It is average magnitude of movements by quanta of matter to produce deformation in latticework-structures of 2D energy-fields. Work is a real entity and it can be transmitted from one body to another or from one place to another.

When we say that a force is transmitted, it is the work that we are transmitting, by transferring distortions (work-done) of one latticework-square to its neighbors, one after the other, in same 2D energy-field. Since force is one of the rates of work-done, it is in existence only when work is being done. A force may be considered as acting or in existence only when it causes additional distortions in any part of 2D energy-field. Otherwise, though effort (or energy stored) is present, force cannot be considered present or active.

As long as effort is maintained and no additional work is being done, force may be considered as being 'applied'. When a force is active, it results in additional work and when a force is applied, it results in no additional work. Since no additional work is done during application of a force, force is non-existent. However, since ability or effort to do work (at same rate as can be done during its action) is present, force may be considered as present in non-active state. In true sense, force comes into existence only when additional work is being done.

In universal medium, an effort is applied against stabilizing (reactive) effort of an inherently stable system. Reaction developed is always equal and opposite of destabilizing effort. That is, magnitude of reactive effort is just enough to bring back stability and remove distortions, an effort is capable to introduce in the system. Only

when one of them exceeds the other, active force or reactive force develop and certain work is done or undone.

Conventionally, work is regarded as a result of an action by force. That is, force or power is considered as primary entity and source of work. In this concept, work is the primary entity and force or power, being rates of work-done, are results of a work-done. Both, force and power are functional entities. Work, on the other hand, is physical displacements of quanta of matter within latticework-structures of universal medium. It is real. If we could see quanta of matter and measure their displacements in 2D energy-fields, an observer could see work-done in its physical state.

Transfer of work (distortion or distortion-field) from one place to another in latticework-structures of 2D energy-fields produces apparent interactions between macro bodies. Force or power are measures of rate of transfer of work. In this text, the term 'force' is generally used to represent transfer of work-done (energy) from a 'force applying body/mechanism' to a 'force receiving body'. Distinction between references (displacement and time) is not always considered. As a result, the terms 'force' and 'power' are used synonymously. In general, they represent actions of an effort.

2.8. Distortion-field:

Reaction, by a 2D energy-field during deformation of its latticework-structure, gives rise to 'reactive effort'. It is the result of stress produced in quanta of matter of deformed latticework-structure. All efforts (natural forces) are produced in this way. Distortions in 2D energy-fields are work. Region of 2D energy-field, occupied by work (in the form of distortions in latticework-structures of 2D energy-fields) may be called 'distortion-field'. Magnitude of distortions in unit area (of 2D energy-field) is 'distortion-density'.

Absolute distortion-density of all 2D energy-fields is same, irrespective of magnitude of their distortions. More distortions in a part of a 2D energy-field do not increase its distortion-density in that part. This is because of reduction in absolute scale of distance measurements. As magnitude of distortions in a region increases, absolute scale of distance measurement decreases correspondingly. Only when we compare distortions in one region of universal medium with distortions in another region, where absolute scale of distance measurement is different, relative difference in distortion-density appear. This is because the scale of distance measurements in each region is unique to that region.

For all practical explanations in this text, distortion-density of a region in 2D energy-field is expressed in terms of absolute scale of distance measurement that is suitable for undistorted part of a 2D energy-field (free space). Accordingly, distortion-densities in different distortion-fields may vary, corresponding to magnitudes of distortions in them.

Depending upon nature and actions of distortions in 2D energy-fields, distortion-fields may be further classified into various types, like; gravitational, electric, magnetic, nuclear, etc. fields. All these distortion-fields are (relatively) dynamic with respect to elements, which produce them. Static distortion-fields are produced by relative displacements of interacting dynamic distortion-fields. Electric potentials and electrostatic fields are examples of static distortion-fields. Only, when two or more distortion-fields interact, they cause translational motion of distortions / work in 2D energy-fields. A moving region of work / distortion-field in latticework-structures of 2D energy-fields may be called an inertial-field.

Displacing a 3D matter-body from one position to another location alone does not constitute work. Work is required to produce a change in the state of its motion that causes displacement. Once certain additional work is invested in association with a 3D matter-body, the body will continue to move at a constant speed, unless additional work is removed by introduction of equal magnitude of additional work in opposite direction.

However, in case of 2D energy-fields, displacements of quanta of matter in relation to its neighbors in latticework-structure constitute work. How such displacements are instrumental to produce change in state of motion or produce continuous motion of 3D matter-bodies at constant speed will be explained later in this text.

Figure 2.25 shows deformation of latticework-square A'B'C'D', in latticework-structure of a 2D energy-field, under action of a hypothetical effort, F. (Real effort can be transmitted only through latticework-structures of 2D energy-fields). Components of hypothetical effort F, at junction-points of latticework-square, deform it to position ABCD. Component of effort F_1 at junction C' displaces it to C. Similarly, component F_2 of effort moves junction A' to A. Similar component efforts displace junctions D' to D and B' to B.

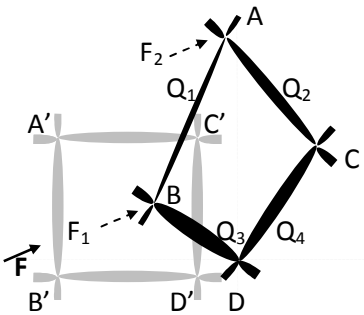

Figure 2.25

Deformation of latticework-square is opposed by neighboring latticework-structure in 2D energy-field. Referring to initial position of latticework-square ABCD, following changes took place in constituent quanta of matter during deformation of latticework-square. Nature of changes in quanta of matter is described only as an illustration. Nature and magnitudes of actual changes may differ according to status of neighboring quanta of matter in latticework-structure.

Quantum of matter, Q_1, is carried from its position at B'A' to its new position at BA. Relative motion by quantum of matter, Q_1, is angular displacement with respect to its neighbors, quanta of matter, Q_2 and Q_3. Hence, quantum of matter, Q_1, remains under stress to return to its neutral alignment with respect to

quanta of matter, Q_2 and Q_3. Stress, caused at junctions, due to displacement of the quantum of matter, Q_1, is the energy stored and it is (numerically) equal to work done on it. Depending on space available, quantum of matter, Q_1, automatically grows in length and diminishes in width.

Quantum of matter, Q_2, is displaced from its position at A'C' to its present position AC. It is not only moved to a new location, but it is also stretched by imbalance in efforts at its ends. It is in tensile state. Tensile state indicates that quantum of matter, Q_2, is free to lengthen-out. It could elongate under its natural tendency, into space provided by displacement of junction A, away from junction C. In order to facilitate this displacement, effort F_1 on neighboring quanta of matter of latticework-square did certain work so that junction A' could be moved to its new location at A. Work-done, in displacing junction A, is equal to work given out by quantum of matter, Q_1, in extending itself. Neighboring quanta of matter are under stress to return junction-point A to its neutral state. Quantum of matter, Q_2, has also moved angularly with respect to its neighbors. This produces stress at junctions A and C. This stress is stored at junction points as part of energy supplied by external effort.

Quantum of matter, Q_3, while moving from its position at B'D' to new location at BD, suffered angular displacements with respect to its neighbors and has reduced its length. Due to its displacement, it is under stress to return to its neutral position with respect to its neighbors. It is also under stress, produced by reduction in its length. Certain work is done on quantum of matter, Q_3, by external effort to reduce its length and to increase its width. This work was accomplished against quantum of matter's inherent property to expand in length with corresponding reduction in its width. Stress (pressure), caused by reduction in its length, is stored in matter-content of quantum of matter, Q_3, in the form of pressure energy. Quantum of matter, Q_3, remains continuously under stress to return to its neutral state and produces reaction in appropriate direction to nullify effects of external effort.

Quantum of matter, Q_4, is displaced from its position at C'D' to its new location at CD. It is also displaced angularly with respect to its neighbors and has suffered a loss in its length. Hence, quantum of matter, Q_4, is under stress to return to its neutral state both in length and in space with respect to its neighbors. In its present state, it stores energy due to its angular displacement at its junctions and pressure energy in its matter-content due to change of its body-dimensions.

As long as reaction from neighboring latticework-squares prevents transmission of distortions through them, distorted latticework-square remains deformed (work remains with it) and stress in constituent quanta of matter remains with the latticework-structure. Deformation due to changes in lengths of quanta of matter and deformation of latticework-square, due to relative angular displacements of quanta of matter, are

generally called as 'distortions', in this book. They are identified as 'distortions in 2D energy-field' or as 'distortion-fields' (when related to latticework-structure of a 2D energy-field) and as 'distortions in matter-field or inertial-field' (when related to the macro bodies).

As soon as an external effort, causing distortion of latticework-structure of 2D energy-field, is removed (or reduced), quanta of matter in deformed latticework-squares revert towards their neutral states. In doing so, they carry any basic 3D matter-particle, which happen to be in their way, in the direction of their displacement. [A basic 3D matter-particle exists within gaps in 2D energy-fields and many 2D energy-fields are in contact with it at its surface].

Conversely, movements of basic 3D matter-particles, in universal medium, may cause relative motion of a quantum of matter within latticework-structure and produce distortions in universal medium. Reactive push from quanta of matter may move a basic 3D matter-particle away from or towards deformed latticework-squares. If latticework-squares are expanding, basic 3D matter-particle is pushed away in same direction and if latticework-squares are shrinking, basic 3D matter-particle is pushed from opposite direction.

In order to produce a reaction, certain displacements or changes in lengths (permanent or temporary) of constituent quanta of matter in latticework-structure of a 2D energy-field are required. Displacements and changes in length of constituent quanta of matter in a 2D energy-field are work. Work produces stress in participating quanta of matter and this stress is energy stored in 2D energy-field.

A work is nothing but mechanical deformations of latticework-structures in universal medium, by displacements or changes in dimensional measurements of constituent quanta of matter in 2D energy-fields. Displacements of quanta of matter include their linear and angular movements and variations in their body-dimensions. Therefore, force or power (whether it is gravitational, electromagnetic, nuclear, mechanical, inertial, etc.) are rate of (change of state of) movements of quanta of matter in universal medium. Displacements of quanta of matter in latticework-structures of 2D energy-fields move basic 3D matter-particles, which in turn causes motion of a macro body.

2.8.1. Transmission of distortion-fields:

Distortions, introduced into one latticework-square in a 2D energy-field, cannot remain isolated. Because of inter-linking, distortion in one latticework-square is also transferred to adjacent latticework-squares. Distortions, produced by an effort in any part of a 2D energy-field, are progressively absorbed by its latticework-squares, allowing them to be strained and distorted. Latticework-square, nearest to the point of application of effort is distorted to highest magnitude, latticework-square, next in front, is distorted to a

lesser degree, latticework-square, farther next in front is distorted to still lesser degree and so on. This is how a distortion-field, created by an effort (applied to part of a 2D energy-field), is transmitted through latticework-structure of a 2D energy-field.

In fact, it is the distortions in latticework-structure (work), which is transmitted through 2D energy-field. Sides of a latticework-square move only so much as required to store work of their share. Rest of work is transferred to next latticework-square and so on. Force is rate of investment of work / distortions. During transmission of a distortion-field, each square of latticework-structure of a 2D energy-field absorbs part of work by remaining in distorted condition to certain degree and passes on rest of distortions to subsequent latticework-squares. Latticework-squares become free to return to their stable condition only on removal of 'force-applying mechanism'.

Since 2D energy-field extends only in one plane, no distortion-field can be transmitted directly into third spatial dimension. Transmission of a distortion-field is restricted to the plane of corresponding 2D energy-field. A basic 3D matter-particle simultaneously occupies gaps in many 2D energy-fields (3D space) in same location. Movement of a distortion-field, acting on a basic 3D matter-particle (in its plane), moves it. Basic 3D matter-particle, being a 3D entity, produces distortions during its motion in all other 2D energy-fields, whose planes are occupied by it. In this way, a distortion-field in one 2D energy-field may be transferred or transmitted to other 2D energy-fields, indirectly.

An effort, on a basic 3D matter-particle, (presumably) acting through medium of 2D energy-fields, has its components in one or more 2D energy-fields in planes occupied by basic 3D matter-particle. Each 2D energy-field transmits distortions only in its plane. Such actions by various 2D energy-fields, occupied by basic 3D matter-particle, together produce a straight-line transmission of distortion-field in 3D spatial system. Thus, it appears that effort / work is always transmitted in a straight line in 3D spatial system.

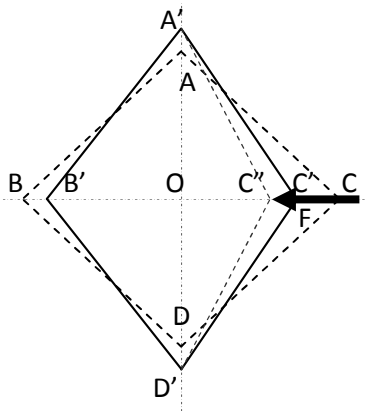

Figure 2.26

In figure 2.26, ABDC (shown in black dotted lines) is an undistorted latticework-square in a 2D energy-field. Its junction-points are under equal external efforts (stress) from latticework-structure. Consider a hypothetical external effort, as shown by arrow, F, acting on latticework-square at junction-point C, in addition to stress from latticework-structure. Junction-point C is displaced to C" by external effort F. Other junction-points, though under external efforts from latticework-structure, are free to move. They are displaced as per physical laws applicable to latticework-structure.

Distorted position of latticework-square is shown by A'B'D'C". Quanta of matter A'C" and D'C" are shown in grey lines. Distortion in latticework-square continues to increase at a rate corresponding to magnitude of external effort, F. Due to latticework-structure of 2D energy-field, distortion of a latticework-square is transmitted in the direction of external effort. Latticework-square nearest to the point of application of external effort has most distortion.

Now, let external effort cease. Since external effort is not present any more, reactions at junction-points tend to reduce distortions and bring latticework-square, back to its stable state. Under reactions (as considered in section 2.6.3), junction-points A' and D' tend to move inwards and junction-points B' and C" tend to move outwards. Due to lower reaction at junction-point C compared to reaction at junction-point B, junction-point C" moves at a faster rate than junction-point B'. Let A'B'D'C' be the resultant shape of the latticework-square after removal of external effort.

Latticework-square has not regained its original state, ABDC, but it remains stable and permanently distorted to certain extent. Magnitude of permanent distortion corresponds to work-done by external effort during its action. Work-done in latticework-structure is the difference between its shapes ABDC and A'B'D'C'. Due to latticework-structure of 2D energy-field, a distortion (work) in it cannot remain static in space; it will be transferred in the direction of external effort. Gradually, distortions in latticework-square A'B'D'C' are transferred to latticework-square in front of it and latticework-square A'B'D'C' will return to its original stable state ABDC. As this permanent distortion is transferred through latticework-structure of 2D energy-field, distortion-field is said to be transmitted.

On removal of external effort, displacements of quanta of matter A'C" and D'C" are reduced to bring them to positions A'C' and D'C', respectively. Differences between their positions (distance between C" and C') is the accelerating component of work available during action of external effort. Latticework-square reaches a stable state, A'B'D'C', (with permanent work invested in it – distance between C and C') only after accelerating component ceases to exist. Thereafter, distortions in latticework-structure are transferred at a steady speed, proportional to distance between C and C'. Total distortions in latticework-structure remain steady until they are removed (partially or fully) by another external effort in opposite direction. (See also section 5.3).

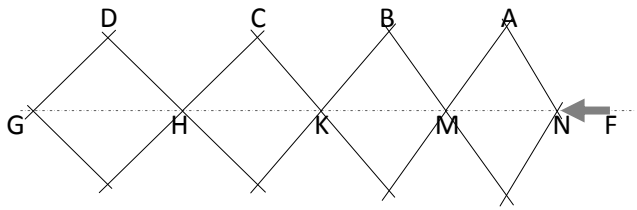

Figure 2.27

Figure 2.27, shows four latticework-squares of a 2D energy-field, A, B, C and D in a straight line. G, H, K, M and N are junction-points associated with these latticework-

squares. An external effort acts on them from the right, as shown by arrow, F. Latticework-squares are distorted from right to left as shown in figure.

Reaction, developed at any junction-point, is proportional to displacements of quanta of matter at the junction-point. During action of external effort, as distortions are developed, latticework-square A experiences greater reaction at junction-point, N, on right and lesser reaction at junction-point, M, on left. Latticework-square A is distorted towards junction-point, M, with lesser reaction. It is distorted to the left. Arms of latticework-square A, formed by quanta of matter on the left are turned by lesser angle compared to arms formed by quanta of matter on the right. Other, squares are also distorted in similar fashion to left. Magnitude of distortions and number of latticework-squares, distorted in straight-line (extent of distortion-field), increase as external effort continues to act by displacement of 'force-applying mechanism' to left.

When external effort is withdrawn by terminating leftward displacement of 'force-applying mechanism', further investment of distortion into latticework-structure stops. Part of distortions, already introduced into latticework-structure, remains permanently in 2D energy-fields and continues to be transferred in same direction, creating a moving distortion-field. Since there is no external effort from the rear, distorted latticework-squares are now free to expand rearward also. Rearward expansion of latticework-squares nullifies part of distortions in latticework-structure. This part of distortions is the accelerating component of external effort, whose magnitude becomes zero after inertial (delay) period.

Figure 2.28, shows absolute condition of latticework-squares after removal of external effort. G, H, K, M and N are junction-points associated with latticework-squares D, C, B and A. Outer ends of latticework-squares D & A and junctions G & N, have no distortions and they are part of undistorted parts of 2D energy-field. Since there is no external effort from left or right, latticework-square D is free to expand to left and latticework-square A is free to expand to right. Since external effort is not present, reaction at junction-point N reduces to nil value. Junction-point M, being within distorted part of 2D energy-field, has certain reaction in it. Latticework-square A expands in the direction of junction, N, with lesser reaction – to the right.

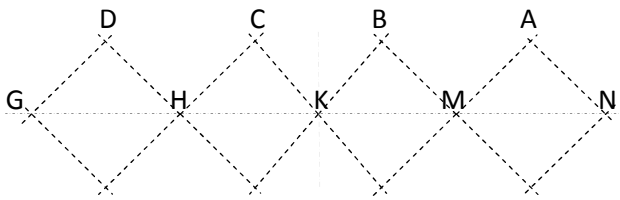

Figure 2.28

Similarly, all distorted latticework-squares of 2D energy-field, readjust magnitudes of their distortions to reach a stable state. Distortions in latticework-structure tend to

spread outwards from junction-point K. Let junction-point K, in the middle of distorted latticework-squares, has most distortions and corresponding stress after readjustments. Quanta of matter of latticework-squares C and B, facing centre line through junction K, have largest displacements of all quanta of matter in distorted region.

Junction-point H has lesser distortion than junction-point K. Latticework-square, C, strains to expand. In order to expand, it has to apply greater reaction to the right and it needs to apply lesser reaction to the left. Latticework-square C expands to (left), where it requires lesser reaction. Latticework-square C expands to left, towards junction H.

Junction-point H is displaced to left, with respect to junction-point K. Distortions of quanta of matter of junction-point H, which are part of latticework-square D. Hence distortions in quanta of matter of junction-point H increase. Part of this distortion is now transferred to latticework-square to the left of latticework-square D. Similarly, distortions in latticework-squares, to left of junction-point K are transferred to left. Undistorted latticework-squares to the left of the region are progressively distorted. This process transfers work invested in the region, in leftward direction within latticework-structure of 2D energy-field.

Expansion of latticework-square C to the left, reduces stress in its arms at junction-point K. Latticework-square B, which tries to expand to right, now has lower reaction from its left-side junction-point, K. Anchor point of latticework-square B, for its expansion, is now changed from junction-point K on its left to junction-point M on its right. Latticework-square B expands to left instead of to right, as shown figure. Although latticework-square B expands as shown in figure, junction-point M does not shift from its present location. Expansion of a latticework-square B is realized by shifting junction-point K to left. Similarly, latticework-square A also expands to left and keeps junction-point N in place.

Distortions in latticework-squares, with respect to 2D energy-field, outside the region of transfer of work, are as shown in figure. Highest distortion-density is at rear region of distorted latticework-squares. Towards forward end of the region, distortion density reaches minimum, latticework-squares just outside the region has no distortions and they are parts of undistorted 2D energy-field. Similarly, latticework-squares outside the region to rear also have no distortions in them.

Distortions in latticework-squares, with respect to each other, remain as shown in figure 2.27. They are in their steady state of transfer, after removal of accelerating components. These distortions (distortion-field) are transferred in forward direction without changes in relative distortions or distortion-density of distortion-field. With respect to latticework-squares, relative magnitudes of distortions in each of them are maintained, while distortions are being transferred in same order, to latticework-squares in front within 2D energy-field. 2D energy-field or its latticework-squares do not move

along with the distortion-field but only distortions (work) in 2D energy-field are transferred in the direction of external effort.

With respect to 2D energy-field, outside the region of distortions, latticework-squares in front of moving distortions are newly distorted and latticework-squares at rear of moving distortions are relieved of all distortions. They appear as shown in figure 2.28. All steady state distortions, moving forward, are confined to limits of distortion-field between latticework-squares C and D.

Distortions are also extended to rear of this region, as in latticework-squares A and B. Distortions in latticework-squares A and B reduce as distortion-field is transferred forward. As distortion field is already moving forward at linear speed equal to transfer of distortions to rear, there is no relative motion of distortions to rear with respect to moving distortion-field. As distortion-field moves forward, undistorted latticework-squares are left behind. Distortion-field, as a whole, is transferred at constant linear speed in a straight line through 2D energy-field, which is stationery but for small displacements of its quanta of matter in place, just sufficient to transfer distortions. This is the method of transfer of a distortion-field (work / distortions) through universal medium.

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

2.8.2. Range of distortion-field:

Distance, through which an external effort can distort latticework-squares of a 2D energy-field, is the range of a distortion-field. It is the magnitude of departure in a 2D energy-field from foremost latticework-square (that is deformed) to rearmost latticework-square (that is deformed) in a distortion-field. This distance determines size of distortion-field in the direction of external effort. Due to transfer of distortions in linear direction through latticework-structure of a 2D energy-field, magnitude of distortions in a distortion-field decrease as distance from point of application of external effort increases.

Range of a distortion-field depends on magnitude of strength of external effort and duration of its action. Greater strength of external effort does introduce distortions of greater magnitude. Initially acceleration components of distortions are much greater than steady state components. Magnitudes of acceleration components of distortions gradually diminish and magnitudes of steady state components of distortions gradually increase as time elapses. If duration of time of application of external effort is too small (approaching zero units), whole of distortions created are of acceleration components and action may not subscribe towards residual distortion-field.

Magnitudes of steady state distortions in a distortion-field increase gradually. For this, 'force-applying mechanism' and its point of contact with 2D energy-field has to remain steady. 'force-applying mechanism' has to move along with point of application of external effort at the same rate. Wherever this is not practical, like 'force-applying mechanism' from a static (source) body, range of distortion-field is limited to certain (constant) distance, depending on strength of external effort and without regard to time elapsed. Therefore, range of distortion-field about a static source body is constant and depends on parameters of source body. Distortions from this distortion-field are not transmitted through universal medium, beyond its range from source body. Thus, a distortion-field, activated by a static source-body has a limited range. Beyond this range, from point of application, applied effort cannot be directly felt.

If 'force-applying mechanism' also moves at same rate as point of application of external effort or magnitude of external effort from a static 'force-applying mechanism' increase at a constant rate, acceleration components of distortions attain constant magnitude. Magnitudes of steady state distortions and their rate of transfer increase at a constant rate. Range of distortion-field (from static source body) continues to increase.

A distortion-field, not associated with a 'force-applying mechanism', continues to be transferred through universal medium at a constant linear speed. Its magnitude and range (extent) continue to be steady. Speed of its transfer is highest possible linear speed and depends on parameters of universal medium in the region through which distortion-field moves. Highest possible linear speed through universal medium is linear speed of light.

Work involves movements and relative displacements of quanta of matter in 2D energy-fields. A 2D energy-field, by its inherent nature, tends to resist movements or displacements of its constituent quanta of matter. It is the constant endeavor of a 2D energy-field to restore relative displacements of its constituent quanta of matter, so that its latticework-structure remains stable and continuous.

Because of its latticework-structure, distortions in 2D energy-field are developed not only in the direction of external effort, but also all around the point of action of external effort. However, transfer of distortions take place only in straight-line direction. For the same reason, resultant of all reactive efforts, developed by distortions of latticework-squares in a 2D energy-field (around the point of action), is in opposite direction to external effort.

2.8.3. Time and inertia:

During development of work, resultant displacement of quanta of matter, with respect to a reference point at a distance, is such that the point of application of external effort moves in the direction of external effort. 2D energy-fields cannot be displaced

along this direction. It is the distortions in them, which are being transferred during transmission of a distortion-field (region where work is developed). Starting from the point of application of external effort, distortions are transferred from one latticework-square to the next in sequence in the direction of external effort.

Distortions in a 2D energy-field are transmitted through latticework-squares in a sequential (one after the other) order. Sequential nature of transmission of distortions or restoration of latticework-squares in any direction introduces a delay for application and transfer (development) of distortions in each latticework-square in the direction of external effort. This delay introduces a factor 'time'. Time delay in these actions brings about the property of 'inertia' of universal medium. Inertia of universal medium determines speed of transmission and stability of distortion-fields (and all other types of radiations) through space. (See section 5.3).

Inertia of universal medium has two fold actions. In case of distortion-producing elements, inertial delay is present during setting up of distortion-fields about them. Once a distortion-field is set up, all actions between distortion-field and distortion-producing element are instantaneous. Field efforts (produced by interaction between two distortion-fields) and gravitation (produced by universal medium due to gaps in it) have continuous mode of application on a macro body. Universal medium about a macro body is continuously under stress. Distortions in universal medium about a macro body are not transferred from one part to another part of macro body, but they exist permanently in association with macro body as long as macro body is in existence under same state (of motion).

Inertial effects were present during setting up and stabilizing distortion-fields. Hence, transfer of information about gravitation and field efforts between macro bodies, on changes in their parameters, in universal medium is instantaneous (See section 7.3). In fact, there is no transfer of information from one macro body to another, but information on gravitation and field efforts are modified separately for each macro body during changes in their parameters. Resulting actions are continuously modified to suit current parameters of macro bodies. Actions on different macro bodies are separate and actions are between each macro body and universal medium (which are in direct contact with each other).

When two or more distortion-fields (of as many elements producing field efforts or gravitational efforts, acting on opposite sides of a macro body) interact, concerned macro bodies are affected by resultant distortions in universal medium. Movement of a macro body, by resultant distortions, involves additional distortions, over and above their distortion-fields. During development of additional distortions about a macro body, inertia of universal medium comes into play again. Motion of a macro body is an inertial

action. Inertial delay is repeated during development of inertial motion (for a second time).

Usually, we notice only this part of inertial action. Because, first part of inertial action took place long before the elements producing distortion-field came into stable existence. There is no mystery in the fact that actions of (apparent) attraction due to gravitation are instantaneous, on changing parameters of a macro body. Inertial actions of gravitational efforts on a macro body were performed during creation of basic 3D matter-particles. Further interactions between their gravitational-fields take place instantaneously, on changes of parameters of macro bodies concerned. However, inertial motion produced by (apparent) gravitational attraction requires further inertial delay (accelerating stage) before stabilizing.

Time duration of an effort, applied on latticework-square of 2D energy-field, may be, at times, is less than time required to transmit received-distortion to next latticework-square. Such an effort cannot transmit distortions through universal medium and stress set up is borne only by latticework-square, where effort is applied. This time duration is of critical value and depends on nature of universal medium in local region only. Nature of universal medium, here, means present status of its stability due to any distortion already present in its latticework-squares.

A latticework-square (of a 2D energy-field), already deformed in one direction, transmits additional distortion in that direction faster but magnitude of distortion, absorbed by latticework-square, is proportionately less. An undistorted latticework-square (of a 2D energy-field), takes longer time to transmit distortion in any direction but magnitude of distortion, absorbed by it, is proportionately more. Hence, range and speed of transmission of a distortion-field depend also on present nature of universal medium in any region in space.

Effort (or force), required to do a work, depends on ability of latticework-squares to produce reactive effort. Work is done only when an effort overcomes reaction (or vice versa). Similarly, work is undone when reaction overcomes an effort. Reaction may be created within latticework-structure of a 2D energy-field or supplied by an external effort. Reactive effort, produced by a latticework-square, depends on angular displacements between its constituent quanta of matter. Larger the distortions in a latticework-square are, greater is the reactive effort produced in it.

In order to produce identical magnitude of work in an already distorted latticework-square, a greater effort is required. In other words, efficiency of an effort to do work depends on present status of distortion-density in latticework-structure of a 2D energy-field. Higher distortion-density, in the direction of an effort, makes an effort less effective. Efficiency of an effort to invest work about a macro body (magnitude of force created by

an effort) depends also on present status of universal medium about the macro body. (See section 5.2.5).

If an effort, acting on a latticework-square, is greater than a single latticework-square of 2D energy-field can absorb, that latticework-square breaks down. Work is transferred to latticework-square at a rate (power) greater than that can be born by it. Latticework-square is distorted at a faster rate than the rate at which it can transfer distortions. This may happen when external effort is too sudden and resulting distortions are larger than that can be borne and transmitted to subsequent latticework-squares, by receiving latticework-square, during inertial delay. In other words, power of external effort is greater than latticework-square can bear. Action of sudden and comparatively large effort can cause local breakdown of universal medium.

2.9. Disturbance:

Any structure or matter-bodies that disturb inherent properties of 2D energy-fields are 'disturbances'with respect to universal medium. Although it is the nature of universal medium to remain calm and serene, disturbances may occur in them, spontaneously or intentionally. Sudden supply of large quantity of free quanta of matter, discarded from basic 3D particles, into a region of universal medium or sudden absorption of large quantity of quanta of matter from its latticework-structures cause production of disturbances. Presence of quanta of matter, having very large or very small matter-content, in latticework-structures of 2D energy-fields, in a region of universal medium also produces disturbances.

Basic 3D matter-particles are produced from disturbances. There are plenty of causes for production of disturbances in universal medium. Hence, whatever be initial conditions of universe, we can say that certain amount of 3D matter, in whatever form, is and was always present in space. All basic 3D matter-particles are disturbances in universal medium.

External effort on a part of 2D energy-field may disturb its stability and structure. Deformation in its latticework-structure introduces stress into a 2D energy-field. If stress, produced by strain is strong enough, 2D energy-field in that area may locally breakdown and some quanta of matter will be detached from their home position in latticework-structure of 2D energy-field. Detached quanta of matter become relatively free and float around in space, before they can regain their places in latticework-structures.

It is not necessary for detached and free quanta of matter to continue their interactions with parent 2D energy-field from which they are detached. Depending upon directions of major axes of their matter-contents, during expansion in 1D space, first 2D energy-field, whose constituent quantum of matter they meet is the destination for all their future interactions.

2.9.1. Breakdown of 2D energy-field:

Quantity of matter, contained in a quantum of matter may vary from one quantum of matter to another. As no new quanta of matter are ever created, we can say that quanta of matter exist eternally in universe. There is no mechanism to regulate matter-content of a quantum of matter during their origin. Generally, majority of quanta of matter have equal matter-content and tend to form stable latticework-structures of 2D energy-fields.

However, there are many quanta of matter, whose matter-content varies from the average. These quanta of matter, when part of a latticework-structure, produce strain and associated stress in 2D energy-fields. If stress created by large quantum of matter is more than that can be borne by latticework-structure (or when distortions in more than one strained parts of latticework-structure join), excess stress, developed at that part of 2D energy-field, may cause its local breakdown. Local breakdowns in 2D energy-fields create disturbances.

Presence of quanta of matter of different matter-contents distorts part of latticework-structure in 2D energy-field. This part of 2D energy-field remains under stress. As and when opportunity arises, strained parts of a 2D energy-field join together to increase stress and cause local breakdown in that part of its latticework-structure. Due to the strained state of 2D energy-field, a quantum of matter with higher matter-content has higher inward pressure at its ends. Higher inward pressure at its ends causes greater growth of quantum of matter into its second spatial dimension. Existence of certain quanta of matter in a 2D energy-field in higher spatial dimensional state causes interference between neighboring 2D energy-fields and may result in their local breakdown. Local breakdown of 2D energy-fields is the first step towards creation of basic 3D matter-particles.

Quantum of matter with very large matter-contents cannot be accommodated in latticework-structure of a 2D energy-field. It may invade space occupied by many 2D energy-fields and create discontinuity in all of them. Consequently, all these 2D energy-fields act on the quantum of matter to compress and maintain its state in higher spatial dimension as a disturbance. This assures presence of 3D matter in nature at all times.

2.9.2. Creation of disturbance:

Since quanta of matter, detached from latticework-structures of 2D energy-fields, during their local breakdowns (or from basic 3D matter-particles), are free-floating objects in space. Each of them grows in length until it encounters another quantum of matter, either free or part of latticework-structure of a 2D energy-field, in its own spatial dimension. A free quantum of matter, making contact with another quantum of matter in latticework-structure of a 2D energy-field starts the process, for it to become a part of that latticework-structure. However, if gap produced in 2D energy-field is comparatively large and free quanta of matter are too many, developing and restoring that part of

latticework-structure takes some time. In the meantime, in order to restore its continuity, 2D energy-field from all around the gap tends to close in on the gap.

Free quanta of matter, within a gap in latticework-structure of a 2D energy-field, are unorganized and behave like independent structure-less matter-particles, each one trying to elongate in its 1D space. Such a group or collection of quanta of matter is a 'disturbance'. A disturbance, formed by a group of free quanta of matter, is neither homogeneous nor isotropic during its initial stage of formation. Although a disturbance is also a collection of quanta of matter, it is very distinct and unorganized compared to latticework-structures of 2D energy-fields, which are orderly formations of quanta of matter.

A collection of quanta of matter, even if it is a matter-body in higher dimensional spatial system, is a disturbance with respect to universal medium. A disturbance of higher spatial dimensional system simultaneously exists in more than one 2D energy-fields. Part of disturbance in each plane is acted upon by corresponding 2D energy-field in that plane. Since a disturbance (or part of a disturbance), in a plane, is not a part of latticework-structure, it breaks continuity of latticework-structure in that plane. Hence, any object that creates discontinuity in latticework-structure of 2D energy-field also can be regarded as a disturbance with respect to that 2D energy-field. A disturbance is a combined matter-body of free quanta of matter that breaks continuity of one or more 2D energy-fields in universal medium.

If for any reason, should 2D energy-field(s) in a place breakdown locally, gap(s) are created in latticework-structure(s) and many quanta of matter are released into space to be free. Should there be too many loose (free) quanta of matter, in a place (pocket or gap) in latticework-structure of a 2D energy-field at any time; natural process of re-structuring of latticework-structure is too slow to assimilate all of them into latticework-structure of 2D energy-field. During delay period, free quanta of matter crowd in the pocket within latticework-structure of 2D energy-field and form a disturbance.

A disturbance affects stability and serenity of latticework-structure of 2D energy-field. Due to tendency of quanta of matter to grow in their first spatial dimensions, each free quantum of matter, within the gap, starts to grow in its own spatial dimension. Growing quanta of matter in all planes, together, exert an effort on latticework-structures of 2D energy-fields to expand the pocket of their existence. Free quanta of matter in a plane cannot co-exist with constituent quanta of matter of 2D energy-field in that plane.

2D energy-field, by its inherent nature, exerts reactive effort on disturbance in the gap, from all around to contain it. Because of its discontinuity, 2D energy-field all around the gap tends to extend into the gap to re-establish its continuity. This action is against the attempt of free quanta of matter to enlarge the gap. Intrusion of 2D energy-field into

the gap reduces sizes of gap and disturbance in it. This phenomenon is the basis for inherent property of 2D energy-fields to reduce disturbances in them, to a minimum.

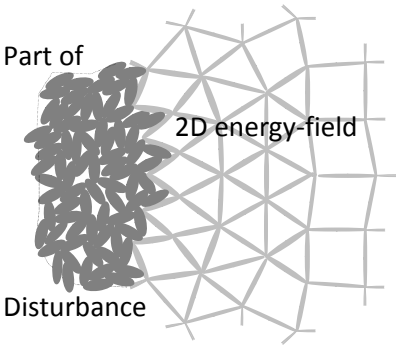

Figure 2.29

Figure 2.29 shows a very small part of a 2D disturbance, near its periphery, with part of 2D energy-field in contact with it. 2D disturbance is being formed from free quanta of matter available in a gap in a 2D energy-field. Quanta of matter are in their 2D spatial state. In the figure, 2D quanta of matter are shown in uniform sizes. In real situation they may be of different shapes and sizes, so as to reduce gaps between them. Quanta of matter tend to grow into space with least resistance. Action in only one plane is shown in figure. Apparent gaps between quanta of matter, as seen in figure, are occupied by quanta of matter in other planes. No space is left vacant. In case of 3D disturbance, similar actions take place in every plane passing through it. In each plane, corresponding 2D energy-field has direct contact with matter-body of disturbance.

2.9.3. Magnitude of a disturbance:

Since thickness of a 2D energy-field is negligible, a disturbance formed in it (or part of a higher spatial dimensional disturbance in its plane) also is a 2D entity. A quantum of matter, finding itself at an angle to latticework-structure, from which it was detached, cannot interact with quanta of matter of same 2D energy-field. It can interact only with quanta of matter in latticework-structure of another 2D energy-field in a plane containing its present position.

With respect to 2D energy-field, a disturbance is a collection of free quanta of matter or a 2D matter-particle (constituted by more than one quantum of matter) or part of a basic 3D matter-particle in its plane and within a gap in it. 2D energy-field is in direct contact with disturbance, all around its periphery. All interactions between disturbance and 2D energy-field take place at place of their (points of) contact. Magnitude of interactions depends on magnitude of their direct contact. 2D disturbance is a 2D entity and a 3D disturbance is a 3D entity. Therefore, contact between disturbance and 2D energy-field of its existence is limited to length of disturbance's perimeter in the plane of 2D energy-field. Thus, measurement of perimeter of a disturbance, in a plane, can be taken as its magnitude (in 2D energy-field of its plane) in terms of interactions with other entities.

Normally, all stable disturbances are circular in shape with uniform matter-density. Hence, perimeter of a disturbance has a definite relation to its size. Size of a disturbance,

together with its matter-density determines its total matter-content. Quantity of matter in a disturbance is its magnitude in terms of matter-content. Since we have no dimensional measurement system, to directly measure matter-content of an entity, we have to depend on indirect measurements. Length of perimeter of a disturbance in its plane represents magnitude of interactions due to its matter-content In this case; we can take it that length of its perimeter as magnitude of disturbance in that plane. This measurement may be modified by a constant of proportion to devise a practical measurement system.

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