FROM MICROBITS TO EVERYTHING

A NEW UNIFIED VIEW OF PHYSICS AND COSMOLOGY

Volume 1: The Cosmological Implications

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Behind it all is surely an idea so simple, so beautiful, so compelling that when in a decade, century or millennium, we grasp it, we will say to each other, how could it have been otherwise? How could we have been blind for so long?

John Archibald Wheeler, Physicist

CONTENTS

Microbits – Galactical Rotation: The Solution for the Outlier Stellar Velocity Anomaly – Recent Experiments on Gravitation – Electron Repulsion – Electron Orbits – Some Microbit Properties – Inelastic versus Elastic Collisions at the Microbit Level – Possibility of Causal Effects at Light Speed c – The Universe as a Binary System – Explanation of the Wave/Particle Duality and Standing Waves using the Microbit Model – Experiments on Standing Waves – 'Wavelike' Behaviour of more massive particles: The example of Electrons and C_{60} Fullerene molecules – Microbit Theory and David Bohm's Quantum Potential Model – Explaining EPR and Bell's Theorem – Summation: Pulses, Pathways, Photons and Recursion – Greater than c? – Emission Theories – Some Historical Considerations: Epistomological Confusion – How exactly did we end up in this relativistic conundrum? – Further Historical Considerations for both Special and General Relativity – Ives and the Technical Undoing of Einsteinian Relativity – Further Considerations on Light – The Sagnac Effect and the Disproof of Relativity – Microbits and the Observational Case against General Relativity: Double-Star Systems – Proposed Solution to the Anomaly of DI Herculis – Internal Inconsistency in Special Relativity – The Problematic Nature of the Inflationary Universe Model – Further Contradictions among Physicists, Cosmologists and Educationalists – Conclusion.

Chapter 1

Motion as the Fundamental Relativity: Absolute Space, Absolute Time and the Collapse of the Einsteinian Theory of General Relativity

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Motion as the Fundamental Relativity: Absolute Space, Absolute Time and the Collapse of the Einsteinian Theory of General Relativity

My thesis is that Einstein's theory of general relativity is incorrect. Specifically, I demonstrate that it is not space and time that are relative, but only motions. Space is constant, it does not contract, simultaneity is not relative, and time does not dilate. I also establish that the speed of light is not the maximum and that there are particles which travel unimaginably faster than light. In sum, I call for a paradigm shift in our concept of space, time and matter.

Space as defined by Einstein

According to physicists Nathan Spielberg and Bryon Anderson:

> Einstein showed that, in a manner of speaking, time and space are interchangeable, as is illustrated by the following set of set of statements, which exhibit the symmetry of space and time:
>
> I. A stationary observer of a moving system will observe that events occurring at the *same place* at *different times* in the moving system occur at *different places* in the stationary system.
>
> II. A stationary observer of a moving system will observe that events occurring at the *same time* at *different places* in the moving system occur at *different times* in the stationary system

III. A stationary observer of a moving system will observe that events occurring at the *same time* at *the same place* in the moving system occur at the *same time* and *same place* in the stationary system.

To illustrate these statements, the moving system might be an airplane travelling from New York to Los Angeles and the stationary system might be the control tower of an airport on the earth. An airline passenger might be sitting in seat 10C. At 8:00 A.M. the passenger is served orange juice, while the airplane is above Albany, New York, and at nine o'clock the passenger is drinking a cup of coffee after breakfast, while the airplane is passing over Chicago. In the moving system, the airplane, both events occurred at the same place, seat 10C, but at different times. In the stationary system, the Earth, the two events occurred at different places, over Albany and over Chicago, as would be seen if an observer in the control tower could look inside the airplane.

The foregoing scenario is very plausible, but a scenario based on the second statement is implausible: Sometime later, when the airplane is over Denver, Colorado, the passenger, who is reading a physics book, looks up and sees a federal marshall at the front of the airplane and a hijacker at the back of the airplane, with guns pointed at each other. Both guns are fired at the same time, as seen by the passenger. As seen by the observer in the control tower on the Earth, however, the shots were fired not simultaneously but at different times. Implausible as it seems, the second scenario based on the second statement is correct.

In a third scenario, after both shots miss, the passenger notices that the flight attendant standing next to him

simultaneously gasped and dropped a pot of coffee in his lap, in seat 10C. The president of the airline, watching from the control tower, sees that indeed the flight attendant simultaneously gasped and dropped the pot of coffee into the passenger's lap, over Denver.

The point of all this is to illustrate that because space and time are intertwined they are relative quantities that are different in different inertial frames of reference. Events that are simultaneous in time in one frame of reference may not be simultaneous in time in another inertial reference frame. Only if the simultaneous events occur at the same place, as in the third scenario, are they simultaneous in all inertial frames.

… Even two otherwise identical clocks will run at different rates in the two reference frames; that is, the time between tick and tock will be different.[1]

[1] Spielberg, Nathan and Anderson, Bryon D., (1987), *Seven Ideas That Shook the Universe*, pp.164-165. The authors go on to illustrate the foregoing by other examples.

Criticisms

The first two postulates are incorrect. The error of the first stems from the fact that there is an inconsistency with respect to the definition of space for the observer in motion as compared to that used for the stationary observer. For the observer in motion, space is said to be the seat, while space for the stationary observer is said to be a geographical location, apart from the seat. In order to truly determine whether the two observers perceive the same thing, space must be the same for both. Space must be defined as either the seat of the observer in motion, or a geographic location. Once the error is corrected, both the stationary observer and the observer in motion must come to the same conclusion.

The second postulate is also incorrect. If two sounds are made simultaneously at different places, they are, for all hearing purposes, one event for the observer in motion. If they are not one event for the stationary observer, it can only be because of his *unequal* position relative to the two points where the shots were fired. If sound travels at a specific speed, then obviously, if the stationary observer were closer to a particular point, he would hear the shot closer to him. But if he does hear one shot first because of the time it takes the sound to travel, it cannot therefore be said that time is relative or that space is relative. It can only mean that the shorter the distance, the closer the contact. A thing either happens at a particular time or it does not. If the shots are fired at the same time, the fact that they happen at different places is irrelevant. When the many shots are fired at the same time, they are for all purposes in one harmony. If the stationary observer were not placed closer to one point of the shot than the other, but placed perfectly midway between the two points, then all things being equal, it would be illogical to state that the shots fired at the same time, which travel at the same speed, and journeying toward the same destination, must arrive or be heard at different times. We

have no problem with the third scenario. But let us see what Einstein himself has to say on the matter.

In the Note to the 15th edition of his *Relativity*, Albert Einstein wrote that:

> I wished to show that space-time is not necessarily something to which one can ascribe a separate existence, independently of the actual physical objects of physical reality. Physical objects are not *in space*, but these objects are *spatially* extended. In this way the concept of "empty space" loses its meaning [emphasis in the original].

Again, Einstein wrote:

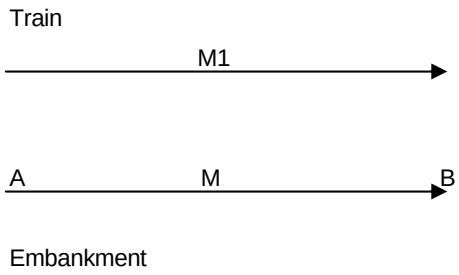
> Descartes argued somewhat on these lines: Space is identical with extension but extension is connected with bodies. Thus there is no space without bodies and there is no empty space.

Einstein then further stated that the general theory of relativity "confirms Descartes' conception in a roundabout way."[2]

Therefore, the "Relativity of Simultaneity"

From the equation of space with objects, Einstein proceeded to state that space and time were relative. To demonstrate this "relativity of simultaneity" Einstein provided the following illustration: **"**Imagine a train travelling on an embankment with a constant velocity in say, a westerly direction."

[2] Einstein, Albert, (1952), *Relativity: The Special and the General Theory*, p.136.



There are observers on the train who use the train as a "rigid reference body (co-ordinate system); they regard all events in reference to the train. Then every event which takes place along the line also takes place at a particular point of the train." Einstein then continues:

> Are two events (e.g. the two strokes of lightning A and B) that are simultaneous *with reference to the railway embankment* also simultaneous *relatively to the train?* We shall show directly that the answer must be in the negative.
>
> When we say that the lightning strokes A and B are simultaneous with respect to the embankment we mean: the rays of light emitted at the places A and B, where the lightning occurs meet each other at the mid-point M of the length A → B of the embankment. But the events A and B also correspond to positions A and B on the train. Let M1 be the midpoint of the distance A → B on the travelling train. Just when the flashes of lightning (as adjudged from the embankment) occur, this M1 naturally coincides with the point M, but it moves towards the right in the diagram with the velocity v of the train. If an observer sitting in the position M1 in the train did not possess this velocity, then he would remain permanently at M, and the light rays emitted by the flashes of lightning A and B would reach him

simultaneously, i.e. they would meet just where he is situated. Now in reality (considered with reference to the railway embankment) he is hastening towards the beam of light coming from B, whilst he is riding on ahead of the beam of light coming from A. Hence the observer will see the beam of light emitted from B earlier than he will see that emitted from A. Observers who take the railway train as their reference-body must therefore come to the conclusion that the lightning flash B took place earlier than the lightning flash A. We thus arrive at the important result:

Events which are simultaneous with reference to the embankment are not simultaneous with respect to the train, and vice versa (relativity of simultaneity). Every reference-body (co-ordinate system) has its own particular time; unless we are told the reference-body to which the statement of time refers, there is no meaning in a statement of the time of an event.[3]

Criticisms: Space is Distinct from Objects and Objects Are *in* Space

Space is not an object. It is distinct from every possible object and constitutes the non-material medium, like water, in which all possible things move. Unlike Einstein, I state that all things are *in* space. My reasons are as follows: Einstein stated that space is the extension of objects. The fact, however, is that there can be no "extension" that is apart from an object. To be an object is to have a certain quantity, quality or, in other words, a limitation. Either the extension referred to by Einstein is part of the object and therefore, the object, or it is

[3] Einstein, pp.25-26.

not. Therefore, it is meaningless to state that the space of an object is its extension. If the space that a building occupied, for example, were its extension, then it would follow that prior to the construction of the building, there were no such space. It would also follow that if the building were destroyed, its space too would be destroyed and further that there would be no space where there are no objects. Clearly, this proposition is false. Before one can build any object, there must be space for it. Space precedes the object. The object then becomes a position in space, according to its size. When the object is destroyed, the space that it occupied still remains. Space is therefore, distinct from objects. Since every object occupies space, it must follow that every object is *in* space.

In addition, an object either is or it is not. If it is, it is, it has a form, shape or function. To point to, or to define an object is to point to or to define a specific or definite quantity or quality. Either the extension referred to by Einstein is part of the object and therefore, the object, or it is not. There can be no "extension" that is apart from an object. It is thus meaningless to state that things are not in space, but that objects are spatially extended. If space is the extension of objects, then Einstein is simply saying that "objects are objects extended". This, however, is meaningless. The fact is that there is a multiplicity of objects. This multiplicity is possible only because objects are differentiated or separated from one another. One object cannot differentiate itself from another unless there is space in between them. If objects were not situated in, and separated by space, then there would not have been many objects but one only. Without space, there would be no plurality but a singularity without gap. What do the facts tell us? Is the sun, for example, not separate from the earth? If these are not separated by space, what is the object that can possibly separate them? If in between them were another object instead of space, the sun and the earth and that object would have been one. Differences, parts and multiplicities can only be the result

of things being contained by and differentiated from one another by space. So, objects are *in* space.

The fact that Einstein's postulates about space are incorrect can be further shown from the contradictory consequences that follow from them. According to Einstein, gravitation is the result of the curvature of space-time.[4] What this means is that the sun bends or depresses the area around it resulting in a funnel-like space with the sun at the narrower base and the earth on the wider curved top. The problem is that if objects were not in space but that space were an "extension" of objects, then Einstein's "curvature of space" would more appropriately be called the curvature of an object. But then, if I ask what object is curved, the answer from Einstein is that no particular object is curved but that the curvature is the result of the depression of the space around it, by the sun. But then if space were the extension of an object, how would the sun depress its extension? And what separates the extension of one object from another? Would there be one extension for all objects or would the totality of the extensions be represented by a contribution from each object? Which part of the space around the sun and the earth would be the sun's extension and which part would be the earth's? The point simply is that the theory implies that the sun is at once itself and the warped or depressed space around it; and the earth too is at once itself and the curved space in which it moves. These are impossibilities. The space of an object is not its shadow and nothing sits or moves in itself. If objects sit or move, they must do so *in* something else. I have already shown that thing to be space. Space, however, is not an object, so it

[4] Morris, Richard, (1987*)*, *The Nature of Reality*, McGraw-Hill Book Company, U.S.A. [Hereinafter, *The Nature of Reality*], p. 95. Richard Morris explains that "objects which move in gravitational fields, according to the theory, do not behave the way they do because forces act upon them. On the contrary, they simply follow the path of least resistance in curved space and time."

cannot curve. Only objects have shapes, since shapes are a function of limitations, distinctions, barriers and multiplicity *in* space. In order to have a curvature, one must have a non-curvature, bordering the curvature. Thus if space were curved, it would be bordered by non-space: this is nonsense. If there is an appearance of a curvature, it cannot be the curvature of space but it must be due to something else. What this something else is, is discussed comprehensively in the next chapter.

Space is Indivisible and Limitless

Because space is not an object, it is not, in fact, divisible. Only objects can be divided. Every limited being or object, whether it is material, angelic or otherwise, must occupy some space. Nothing sits in itself. Besides, the law of opportunity cost must apply to all possibilities. It is not possible to have limited things or worlds unless they are situated in and separated by space. So wherever there is a countable or limited thing, there must be space. If there is an objectless part of reality, there must be space at that part of reality. Nothing else is conceivable as being present where there are no objects. Every thing must be in some type of space; whatever world you conceive of cannot be but in some type of space. There cannot be a spaceless nothing. But space itself need not be in anything and is not contained in anything. Thus both at the "material" and "non-material" parts of reality there must be some space. Reality consists only of the "material" and the "non-material". Therefore, it must follow that there must be space everywhere, or space is everywhere.

Space must be indivisible because in order to have any difference between things, or in order to divide anything at all, one needs space. One cannot logically demonstrate the possibility of multiple "spaces" separate or distinct from one another. If you

could 'add' trillion spaces to a trillion spaces you would end up with only one space. Consequently, there is only one indivisible limitless space. It is absolute.

Therefore, no Relativity of Simultaneity

Since space is indivisible and immovable, it is not subject to change. It is, therefore, constant. When an object moves, space does not move with it. It is an unmoveable space that makes motion possible. To move or to have a gap, one needs a space. Because space is constant, Einstein's General Theory of Relativity about space and time must be wrong. Let us go back to his example described earlier. In the example, Einstein stated that two events, which happened simultaneously from the point of view of a stationary observer, may be perceived as non-simultaneous by an observer in motion. From this Einstein concludes that therefore, simultaneity must be relative. The error of the conclusion however is this. To say that some thing is simultaneous with another is to say that both happened at the same time. If you had a clock, both should read the same time. It is true from Einstein's example that the observer in motion may not see that the two events occurred at the same time. But the problem exists only because there is only one observer and he or she shifts positions as the train moves. But the problem can be corrected this way. Instead of one observer on the train, let us make the train itself the observer. Since the train corresponds to the embankment, this would mean that each point of the train would be an observer in motion which corresponds directly with positions A and B on the embankment. Equip every point of the train with a timing device. If we do this we would realize that at the moment that the two events happen at A and B, there will be two observers in motion whose records should match those of the observers at rest.

We must always make a distinction between an event and the perception of that event. The perception of two or more observers at different speeds may differ about an event. However, to be an event is to occupy a position in space at a particular time. That means that whether the two observers agree or not, the particular event had its place and time. The differences in perception of the observers cannot, therefore, justifiably be used to support the conclusion that there was no event at a particular time and space. If there is any problem, it must lie with the observers and not with the event. In fact, the problem of relativity is not a problem of speed only. Any difference in the *position* of observers could give rise to differences in their perception. A foot is a foot, but a foot from up in the sky looks smaller than a foot on the ground with the naked eye. But does it then mean that, in fact, a foot is less than a foot? Of course not! The guy high up in the air has a problem. He is too far away, and with his vision cannot see clearly from that far away. What he needs is a device, say a telescope, to compensate for the distance. Once he has the telescope there, he sees the foot as a foot, as clearly as though he had never even left the ground.

It is very difficult to substantiate the claim that space is relative. Because it is not an object and it is limitless, space cannot be sensed, captured or quantified. Consequently, it is not possible to prove the relativity of space by a visual demonstration. Furthermore, if space were relative, depending upon whether one was at "rest" or in motion, Einstein could never have been able to figure that out or prove it. This is because he could not be in the two frames at the same time so as to compare the different frames. If there were not a constant or fixed space to allow for the comparison, his conclusions would have been a mere guess. What type of logic or order do you think governs relativistic objects or frames? Fundamentally though, the attempt to prove the relativity of simultaneity fails because the concept cannot be logically demonstrated. It is a logical error to state

that simultaneity is relative. The thing either is simultaneous or it is not. An event cannot be said to be simultaneous and relative at once. There can be no thing as the "relativity of simultaneity."

Despite the foregoing, however, there appears to be support for Einstein's General Theory of Relativity in the form of (1) Time Dilation and (2) Space Contraction.

Time Dilation

What is time dilation? Harald Fritzsch explains it with the following demonstration. Suppose you place a satellite at approximately 150,000 km away from the earth and equip it with a special mirror that can reflect a signal sent from the Earth. The speed of light is approximately 300,000 km per second, so it would take a light signal sent from the earth a half of a second to reach the satellite and the signal would also take half a second to bounce back from the satellite. Therefore, the transmission of the light signal between the satellite and the earth would altogether take a second. Now imagine that there is a spacecraft that is moving rapidly past the earth and observing the light signal from its window. Let us assume that the observer is moving at a speed of 100,000 km per second past the earth. Let us suppose that a radio signal is sent out to the spacecraft observer any time the light bounces and the spacecraft receives the signal so that he or she would know when the signal is received. Because the spacecraft is moving away from the earth:

> We see right away that the light signal in the spacecraft's system has a longer path than in the earthbound system... In the spacecraft's system, the exact length of the path depends on the speed of the spacecraft relative to that of the earth. Since light has the same speed in every system, it would follow that the time in the spacecraft's system runs

> differently from the time on Earth. The path that the light signal has to travel is longer in the spacecraft's system than in the earth bound system. On the other hand, the speed is the same in both systems, so the time interval must be greater than a second. In other words, time is being dilated. A second in the Earthbound system – that is, a second for our light clock – appears in our spacecraft system as an interval longer than a second.[5]

Does the above illustration prove the dilation of time? Far from it. If the speed of light is constant, then it follows that it must take a longer time for it to travel longer distances. Because the spacecraft is moving faster away from the earth, the distance between it and the signal sent from the earth increases. If as a result of the speed of the spacecraft, the distance between the signal sent to the earth and the satellite is 100,000 km in a second, naturally, the light would need at least one third of a second more to reach the spacecraft. But while more time is needed in order to reach the spacecraft, the conclusion can only be that where the speed is constant, travelling more distances requires more time. In order to prove time dilation, one must place the spacecraft at an exact distance from the earth as the satellite. Then let the motion of the spacecraft be *circular* or *repetitive* in order to obtain the requirement of motion without introducing more distance between the craft and the earth. It is only when, as a result of the motion of the spacecraft, and not as a result of the increasing distance, it takes longer for the signal to travel, that one can justifiably say that time dilates for a moving observer. My prediction is that if

[5] Harald Fritzsch, (1994), *An Equation that Changed The World: Newton, Einstein and the Theory Of Relativity*, [hereinafter, *An Equation that Changed the World*], pp.107-111.

this is done, no difference would be found between the spacecraft and the earth's time.[6]

What is Time?

Time is no more than a rhythmic measure of constancy. Because of the limitations of our brains, we cannot meaningfully relate to things in their isolation but must process them and relate them to classes, families and sequences. Time is our arrangement of events in succession. Through custom we say, for example, that so many motions of this represents an hour or that so many motions of the moon, represent a lunar year. But motions are just that: motions and not time. It is entirely arbitrary that we call 12 moons a year. Why 12 and not 2000? As long as the event is quantifiable in a continuous or regular basis, the type of event is irrelevant. In this respect, time is no more than a counting machine. Anything that can count continuously would do. But the significance of events as time is not so much the events themselves as much as it is their *number* and therefore, the position of an event in relation to other events. Because what we call

[6] See *An Equation that Changed the World*, p. 139. Because of the foregoing, I find the so-called twin paradox to be erroneous. The paradox is explained by Fritzsch as follows. If a 30 year old twin leaves the earth and travels close to the speed of light for 20 years upon return at age fifty he would see that his brother has aged 40 years in the meantime. The problem is that if one could move faster than the earth, one could only exit but one would not be younger than one's actual age upon one's return. Unless the moon stopped moving regularly, the number of moons that make up a year would remain the same and the folks who do the counting could count your years for you as though you never left. One could *look* or *feel* younger, but that is another issue depending upon physiological processes and not Time. We discuss the so-called paradox extensively in Chapter 2.

time is counting events only, the measure can be standardized and synchronised across different systems or frames.[7]

Therefore, any event, which is regular and countable, would do: it could be a distance travelled, a tick, a clap, a hum or a drop. The difference between the clock and another moving thing is not that one is time and that the other is not. No, rather, the difference lies simply in the fact that the motion of the one is regular and counted continuously while the motion of the other may be irregular or even if regular, not counted continuously. To ask what time it is, therefore, simply means to ask how many motions or events there have been since the last count. By taking one regularly occurring event and making it our yardstick, that event becomes, as it were, a countable constant. Since space alone is constant, time, in other words, is a human substitute for space. In this sense then, time can be equated with space. But the equation of time, here with space, does not at all mean that there is such a thing as time independent of space. Time is merely the language of the restless for stability; time does not exist in reality. Reality is timeless.

Our sense of duration is only a memory of events in succession. That sense itself exists only in our heads. Yesterday and tomorrow do not exist anywhere in reality. There is only the present. But the present itself is not a place. Each one of us is an event, and the present is no more than your event. Thus, our sense of time is no more than a memory of events, without which we would have no sense of successive time.

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[7] See *The Nature of Reality*, p.93. Richard Morris explains that: "According to the special theory of relativity, it makes no sense to say that spatially separated events are or are not simultaneous. Nor can one meaningfully speak of 'now' in a distant place. The relativity of time implies that the concept of 'now' cannot be extended beyond the place I call 'here.' If there is no simultaneity, the 'now' cannot be universal." With all due respect, all possible reality is in the "now."

Motion as the Fundamental Relativity

Space Contraction

Space contraction is the postulate that:

> [A] change in the state of motion of the observer implies a change in the structure of space. More precisely, space will contract in the direction of motion; the rate of this change is the same very gamma factor that describes time dilation.[8]

The error of this space-contraction business appears to stem from the confusion of distance, events or positions with space. But distance, an event or an object is different from space, and its contraction or expansion has absolutely no impact on the constancy of space. If a measure, an event or an object contracts, that can be explained either by way of a problem with the perception of the observer or changes in the composition of the object or event. This, however, cannot be said to lead to the conclusion that space contracts. To say that a thing contracts is to state that it occupies less space than before. Space, however, cannot be said to occupy less space than before. We have already seen that space does not move. It goes nowhere. It cannot therefore contract.

Microbits and the Significance of Paths at the Subatomic Levels

There is no vacuum in reality. Reality is a continuum between the manifest and the "hidden". In between these two points lies a whole range of incredible number of ever increasingly smaller things. Let us call the least possible thing a microbit. Photons and quarks etc., are

[8] *An Equation That Changed The World*, p. 148.

not the least possible things in terms of size. There are smaller things than these and the smallest things are the closest to "nothingness".

All things are made up of microbits and the difference between one object and another merely lies in their number and positioning in space. There are microbits everywhere in the universe. But the degree to which the presence of microbits affects the behaviour of any given object depends upon the object's number of microbits, its position and structure and therefore, its function or speed. Quantities, structure, positions and speed are the only things that make some microbits birds, and others elephants.

The difference between the electron and the photon is not that the electron has mass and the photon doesn't. Rather, the difference is that the two move in different *paths* or *directions*. At the subatomic level, each thing moves in a specifically and rigidly defined path. The path is equally as important as the quantity or structure of the particle. A change in the direction or path of a particle therefore, results in a change in its behaviour. If you can imagine each particle as having a hand, in one direction, a handshake is possible, while in another directions it is not. Of course, there are consequences that flow from this.

In terms of negatives and positives between the electron and the positron, they result simply from the differences in their paths. A positron is simply an electron travelling in a different direction. In this respect, the particle identified as a 'photon' in collision experiments is just an electron that travels in a different path from both the initial electron and the positron that collide. If, for example, the electron and the positron move east and west the 'photon' moves north and south. Clearly then, the electron assumes the speed of a photon when it ceases to move east or west and begins to move north or south and is mistakenly identified as a photon in contemporary physics. Currently, scientists attempt to increase the speed of electrons to

reach that of light by using heavy duty Particle Accelerators.[9] Not surprisingly, this has failed to reach the desired result. The reason is obvious from the foregoing. If you want the electron to move like the photon, make it like the photon; change its direction and it will accelerate. The mechanism by which a change in direction occurs is by way of disturbance, the simplest case being a collision with a resulting *flip* that changes the direction of both or either of them.[10]

What is Light?

Light is the *result* of the interaction of particles at their own level. Light is not so much a transmission or emission from one object, defined as the source, as much as it is the consequence of the motion of two or more objects already present and in proximity. The production of photons is not unilateral with the alleged single source producing light 100% by itself while the so-called destination waits passively in an apparent vacuum to be supplied with light. Rather, the process is like a rubbing of dry sticks or stones together. One dry stick does not give light by itself but when rubbed against another at

[9] See *An Equation That Changed The World*, p. 173.

[10] In this respect those interested in the issue of antimatter may find it very useful to determine the fundamental path of matter. Antimatter is no more than matter that moves in a fundamentally different path or direction than that of matter. Of course, in reality, the default path must be rigidly fixed to maintain the system's integrity and the degree to which one can change the direction or path of same must be limited. Nevertheless, the possibility exists for some manipulation more so at the subatomic level than at the macro level. But the dangers of such things can be so overwhelming that should human beings succeed in finding the direction or path of matter, that could spell the end of the world as we know it, due to destructive military applications. For this reason, I wish that I were wrong on the matter of paths.

a determined speed with a determined force in a dry atmosphere, light results. Light production throughout the universe is, as it were, a rubbing of dry sticks. The process is better described as one of activation rather than of transmission.

The light of an ordinary vehicle standing one thousand miles away from an observer does not travel at 300,000 km per second while the vehicle remains at rest, to reach the observer. No! We know that if the vehicle remains at rest and the distance between it and the observer is maintained, its light would remain where the vehicle is. It would not be visible to the observer. As the vehicle travels and comes closer to the observer, however, its light necessarily becomes visible. Light from the distant sun, for example, is perceived because of the quantities of photons involved. Indeed if light (individual photons, that is) moved from place to place you could never have light from your kerosene lamp, for example. Carrying out simple calculations, it can easily be shown that it would not take too long for light to be as such unless a light source were of unrealistically immense number of photons. One would need such an unrealistically high number because if the photons did in fact travel away from it ceaselessly at about 300,000 km per second, a kerosene lamp, for example, could never light the home of the person who lit it, but that the photons, by continuously moving away from the source, could not allow for the cumulative and continuously sustained glow that is called light. In a second, the very first batch of photons would be about 300,000 km away from the source. That is to say, at any moment more photons must be produced than leave. The problem is that regardless of how many you have, all the photons must move at the same speed. The number of photons produced at any time is, therefore, irrelevant for the issue of continuity. What matters is the rate of production. The only way by which one could maintain the continuity of light would be to produce the next batch of photons faster than the rate at which the first batch

leaves, remembering also that the photon never rests and moves at a constant velocity, according to the contemporary view in physics. In other words, before the first batch leaves, the next batch must be born. In order to have the next batch born before the first leaves, the speed of the photon necessary for the maintenance of this fantastical rate of production must exceed the speed of light. If this is true, then the speed of light is not the maximum. I have no problem with the speed of light being exceeded. The problem here is this: how does the light source move faster than light? Just think about it. If the speed of light is the maximum, then it must follow that the photons do not leave their source and travel. Obviously, this does not happen, but with the contemporary photon model we are forced to believe that somehow, the electrons in the lamp are releasing an unrealistically large number of photons from the kerosene lamp.

With the microbit model, light does not travel away from its source but stays with it, with more photons making a bigger circle and therefore a bigger glow. The existent photons in and around the lamp are continuously being activated. This is analogous to having a number of transmission lines being constantly activated. If, for example, there are one million photons around the lamp (to use a simplistic example) and each were activated one million times on average, thereby activating others adjacent to them etc., in a cascade, then on the recording end of the experimental set-up, one would count a million million (10^{12}) photons. With the current model in physics, however, you would need, on the contrary, 10^{12} photons being generated *within* the lamp, and each of these then travelling to the source. In other words, in the contemporary model, using this simplified example, you would need one million times more photons than in the activation model being advocated in this book.

The ability to see light from any given source must depend upon the *number* of ambient photons generated. The reach of light depends solely upon the quantity of these pre-existing photons

generated. The more photons that are generated, the larger the space glowed by them and, therefore, the farther the reach of the light. Photons do not travel away from their source, but circulate within and around that source.

The Uniqueness of Light

The speed of light on earth is about 300,000 km per second and it appears that, unlike other objects, the speed remains constant regardless of the velocity of the light source. The speed of light from the fastest moving aeroplane is the same as that of light emitted by a bicycle. This has led majority of scientists today to conclude that therefore, the speed of light must be "the universal constant of nature" and that it cannot be exceeded.[11] This, however, is a hasty generalisation and is wrong. But before I proceed, let me explain what I think what light is, and why light's speed remains the same, regardless of the source's motion.

The reason why light continues at the same speed regardless of the speed of the carrier is not because it is the maximum, but simply because it moves differently. Light does not travel in the same manner as does the carrier. The bicycle or the aeroplane carrying the light moves from one place to another, but light does not. The carrier's motion is 'geofluid' while that of the light is 'biofluid'. Light's motion is repetitive within itself. It is a frequency, it blinks only. In order to add the velocity of one thing to another, both things must be moving in the same *direction*. A thing that repeats or blinks, however, is not in the same direction as a thing that moves from place to place. In order to increase the velocity of a thing that repeats, one must reduce its *rest* factor. Light's manner of moving is like that of a clock.

[11] *An Equation That Changed the World*, p.86.

Motion as the Fundamental Relativity

No matter how fast or slow the source from which a clock is thrown, when it is checked, it naturally still beats at a second per second. This explains why the speed of light is not affected by the velocity of its source. It moves at regular intervals and so its speed can be said to be constant. But constancy is not a wall. If you want to increase the number of times the hands of a clock moves in a minute you do not throw the clock from a fast moving object: you must wind it up.[12]

Microbits and the Drag Factor

I submit that the above explanation about the uniqueness of the motion of light is correct. However, should it be wrong and should light move in the same manner as any other object, I offer the following alternative explanation as to why the speed of light cannot be the maximum. In reality every thing sticks. The reason why every thing sticks is because the ability to stick to another is the simplest way to link a multiple number of things. Every thing is born with a stickability that compels it to attach to another *defined or specific* thing under the appropriate conditions. This simple means of attachment makes the unity and organic union between things automatic. But a thing's degree of attachment to another depends upon many things,

[12] See *An Equation That Changed The World*, p. 173. Therefore, in so far as other particles are similar to the photons, particle accelerators that seek to increase the speed of particles to that of light would need to change the direction and the technique of the acceleration. Currently, in order to get very close to the speed of light, at say, 0.9999973 per cent, protons for example, are accelerated by an energy level that results in a so-called increase in the relative mass of the proton at about four hundred times its rest mass. I predict that if you could find the direction or path of the photon, and direct the proton that way, this would result in the creation of a proton moving at the speed of a photon.

including its number of microbits, its position, structure etc. But stickiness is a drag. The speed at which an object travels is mediated by the degree to which it attaches to its neighbours. The more things attach to the particle as it moves, the more it rests and the more its speed is slowed. Because it is not an island, the photon like all other things sticks to its 'brothers' and 'neighbours' in precisely defined relationships. These neighbours are microbits and other things. The less the number of microbits, in its path, the faster the photon would be. The reverse is true. In other words, one can change the speed of the photon by disturbing the number of microbits or attachable things in its path, or by disturbing its attachability. The speed of the photon is therefore, the *speed in drag* and not the maximum speed. If this drag were reduced, the speed would increase.

The Fastest Possible Object

Since photons have attachments, unless it can be stated that photons have the least possible stickiness to things on earth, and for that matter, the universe, it must follow that an object with less attachment than a photon but with the same amount of energy would exceed the speed of light. The only possible way by which a photon can have the least possible attachment is for it to be indivisible further or to be the smallest thing ever. But the photon is made up of a number of microbits and it is therefore divisible into smaller parts. These microbits are smaller than the photons with correspondingly less stickiness. These are faster than the photons.

The fastest object must be the object that can travel the most distance in the least amount of time. As we have seen, time is no more than counted events. The fewer the number counted, the less the time, and the more the events, the more the time. Now an event is no more than a movement, activity or change in space. Therefore,

the least possible event is the same as the least possible motion, change or activity in space. By definition, speed is the measure of the distance covered per unit of time of an event or activity. Therefore, the fastest object is simply the fastest event. In other words, the fastest object is the fastest event that can take place as the least possible event (time) takes place (noting that time is nothing but a measure of motion or change in absolute space). The least possible event can only be one. Therefore, the fastest event can either be a bigger event than the event of time, or it must itself be the least possible event. But the fastest event cannot be bigger than the event of time, because the event of time (the smallest motion) is simply the smallest event possible. Any bigger event must be a number of these least possible events. So, the fastest event must be the event that takes place as the least possible event takes place. Since the fastest event cannot be bigger than that of time (the smallest possible motion), it must follow that the fastest event must be the least possible event. That is another way of saying that the fastest event is the least fraction of time.

But time is no more than a quantifiable activity, motion or change in space. The least possible event is, therefore, the smallest change or activity in space. A change or a motion always takes place between two ends: the beginning and the end point. The least possible change or movement, is therefore, the change between the two smallest or shortest points in space. Two shortest points in space are the same as the least portion of space. The fastest possible event, therefore, lies in the motion of the smallest possible object in space.[13]

[13] . In other words, the less material a thing is, the faster it can be.

Conclusion

I have shown that reality represents the configured positioning and motion of microbits in one limitless Space. Space is constant and it does not contract, time does not dilate and the speed of light is not the maximum in the universe. Contrary to Albert Einstein's theory of general relativity, I submit that it is not Space or Time that are relative, but only motions and events in absolute space.

Chapter 2

Microbits as a New Model for Physics and Cosmology

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Microbits as a New Model for Physics and Cosmology

Introduction

In Chapter 1, M. Muslim deconstructed the predominant views of physics and the universe that deal with 'space' and 'time'. In this chapter, we shall be examining how gravitation, electromagnetism and the other forces can be explained by 'microbits', in a unifying manner. We shall also examine some historical events that have transpired to bring about the present theories of Einstein *et al*. We are convinced that the new model of the universe, being presented here for the first time, is a comprehensive view that is poised to replace general relativity and quantum mechanics in its most basic concepts.

The basic claim of this new theory is that there is only one fundamental type of particle from which the entire universe has originated and evolved. This particle not only comprises all of the forms in this universe, but so too does it comprise all the so-called four forces that are known to exist in contemporary physics. Microbit theory does not introduce microbits arbitrarily, but, rather, they are an integral part of the evolution of the universe – without which there would not be any universe of our kind. If one recalls the famous story of the village of the blind, where the body of an elephant was interpreted differently by people attaching themselves to, or feeling only specific body parts, such as a snake for someone feeling the trunk, or a tree, for someone feeling the legs, and so on, we seem to be in a similar situation with physics today. In this case the elephant is a very tiny thing indeed! It is the

microbit, but it has not been generally realized that it exists even conceptually, and that, furthermore, it is the unit for building everything in existence – even for the so-called four forces. Although we shall explain microbit theory in this section with respect to the 'forces' that exist in physics and achieve unification, the model is a visual one, describing concrete interactions.

Before the 19th Century in Europe, the exact mechanics of the hydrological cycle was not known and there were several theories in vogue. Einstein's relativity is like one of those *incorrect* theories that may only *partially and operationally* explain things, though the reality of the actual mechanics is not explained. Our explanation tries to replicate in one's mind, the concrete interactions surmised as taking place in nature. Although this book has some mathematical treatment, a detailed mathematical construction can be given at a later stage, once the theory gains supporters and/or its predictions start manifesting themselves further, upon research and experimentation.

The microbit model is based purely on two primary notions:

- The existence of absolute (flat) space.[14]
- The motion, shape and distribution of the sub-submicroscopic structures in absolute space which we term *microbits*, or the *origin particles (O-particles)*. One could say that the microbits are the 'atoms' or unit building blocks of the sub-atomic

[14] Refer to: de Bernardis, P., *et al*, (2000), "A flat Universe from high-resolution maps of the cosmic microwave background radiation", *Nature*, pp. 955-959. Hu, Wayne, (2000), "Ringing in the New Cosmology", *Nature*, pp. 939-940. Note that the latest research not only further confirms the Big Bang origin of the cosmos, but the most accurate observation to date also reveals that the universe is flat (i.e. not curved).

particles and all the known 'forces'. They are the smallest inanimate entities next to absolute nothingness.

In this microbit view, many aspects of special and general relativity are seen as approximations of this theory, just as Newton's theory would now be regarded as an approximation to Einstein's equations. However, if Einstein's theories are seen as representing reality, then such a claim for these theories are erroneous in the sense that firstly, General Relativity is only an operational theory, in our view, whereas Special Relativity has internal contradictions within its very foundation.

We believe that the mechanics of the universe are circumscribed by what could be termed *microbit cosmology*. Historically, it must be remembered that just as when the geocentric theory tended to make the explanation of heavenly phenomena more convoluted, with the heliocentric model solving the observational problems, so too does microbit cosmology yield a unifying view from the micro to the macro, eliminating all the basic problems and disunity inherent in quantum mechanics and relativity.

The Solution for the Origin and Unity of the Physical Forces

The universe has emerged from a 'singularity' (Big Bang)[15], which, as it 'exploded', dispersed the initially compact type of particle,

[15] Srianand, R.; Petitjean, P. and C. Ledoux, C., (2000), "The cosmic microwave background radiation temperature at a redshift of 2.34", *Nature*, pp. 931-935. The latest support for the Big Bang comes from cosmic microwave background radiation. The basic prediction of hot Big Bang cosmology is that its temperature should increase with increasing redshift. The latest measurements as reported by Srianand *et al*, are in agreement with the temperature of 9.1 K predicted by hot Big Bang cosmology, since they show us that the background radiation was indeed warmer in the past, falling between 6.0 K and 14 K.

which we call the microbit. All microbits in existence were once all joined together as one piece, forming the 'singularity'. The microbits, enclosed in such a small volumed region, arose as a necessary logical construct of the simplest and most elegant structure of reality in absolute space, from which all the further complexities of the universe evolved. Indeed, no simpler object could have existed from which to 'kick off' the universe, which would later, through permutations and combinations, have formed this vast system we call the universe. This 'singularity' that we are describing is not of the type connoted by the standard mathematical usage of the term 'singularity', that is, a dimensionless point of infinite density. Rather, the singularity that we are referring to, was neither infinitely small nor infinitely dense; rather, it was the densest possible spherically compacted region of a finite size, built of the smallest possible particles.

The question which naturally arises is that if the singularity, with the 'explosion', fragmented into these unit particles with spherical expansion, then how did the accretion between all the microbits take place to form the very early subatomic particles, such as electrons etc.? Now, as stated before, the inherent property of microbits is that they have a natural adhesion, that is, they are 'sticky'. It is this bonding property that has caused the production of all other present elementary particles. With the 'explosion', the microbits started to move away from each other; however, conversely, at the same time, the adhesive property of the microbit also came into play, creating larger particles by intercollisions. Any heterogeneity in the initial expansion from the singularity, as we have described it, was set right at the beginning as an initial property of the expansion. Obviously, first, the smaller particles developed, such as the electrons, photons, quarks etc.; then these began to combine to produce the first atoms (hydrogen and helium etc). One may review the standard development of particles in

numerous literature on the Big Bang and note that the description based on microbits differs for the earlier and the 'unknown' periods before the Plank Era of 10^{-43} seconds. According to the contemporaneous models, physicists cannot sensibly describe any moment before the Plank Era. After the Plank Era, and after 10^{-35} seconds subsequent to the instant of the Big Bang, the forces of nature are thought to have separated, and quarks and leptons begin to form in great quantities. This is known as the Hadron Era, which lasts until 10^{-6} seconds after the Big Bang. Following this is the Lepton Era, when protons and electrons are created and antimatter is annihilated. This Era spans from 10^{-6} seconds to 1 second. From 1 sec to 1000 seconds, nuclear processes occur and helium is synthesized and ionized gases form up to 10^{13} seconds. From 10^{13} seconds to $5x10^{17}$, galaxies form. In fact, as it shall be exemplified in due course, not only are *all* particles made up of microbits, as stated before, but so too are all the forces. With microbit cosmology we can explain things right from the beginning – *from zero seconds* and follow the microbit processes as the microbits coalesce to form electrons, atoms, quarks and, prior to this, smaller particles that make up quarks and electrons not detected yet in physics. *In microbit theory, there is, consequentially, no distinction between particles and all the forces.*

Predictions of the Microbit Model

Some of the things that this theory predicts are:

From Microbits to Everything

1. Everything has mass. Mass has been redefined in this model as the conventional human measurement of motion influenced by the stickiness (adhesive) property of microbits.[16]
2. The electron[17], photon and quark are not elementary particles but are ultimately comprised of microbits – the unit particle.
3. The universe has an edge and the balloon analogy that physicists usually give as a solution to, or try to escape from the 'edge problem' is problematic in itself.
4. The universe has an absolute centre of expansion although to us we seem to be at the centre.
5. Faster than light travel is possible.
6. The velocity of light is independent on the source, but the velocity is not c in all frames of reference.
7. Einstein's theory of general relativity, in terms of curved space, is only a mathematical model depicting motions or ensemble interactions of microbits. Curved space is fiction and this fiction will increasingly be realized with the passage of time.
8. There is no indeterminism in the universe.
9. A field is a set of particles dynamically structured in a particular fashion in absolute space.
10. The interactions between particles smaller than the present assumed 'elementary' particles can be described by what we term *microdynamics*.

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[16] It has recently been discovered that neutrinos also indeed have mass, albeit very small! Refer to: Giles, Jim, (2001), "Flavour switching solves riddle of missing neutrinos", *Nature*, p. 877.

[17] Maris, H. J., (2000), "On the fission of elementary particles and the evidence for fractional electrons in liquid helium." *Journal of Low Temperature Physics* (2000). The latest research suggests that the electron is being split, in its passage through liquid helium, into 'electrinos'; these have been hypothesized by Maris in order to explain the tiny bubbles that are created when electrons are injected into liquified helium.

11. There is no action at a distance, as contact is made at the microbit level, and not through 'virtual particles'.
12. The bending of light around the sun, can be explained by the interaction of the photons with the gravity particles – not curved space. This, we predict, will be confirmed in the future.
13. The gravitational model that emerges from the microbits model has been applied, in this book, to solve the problem of the rotational velocities in spiral galaxies. The model explains the high rotational speeds for the 'outlying stars', and reveals that there is no dark matter halo in such galaxies, needed to explain the non-Newtonian speeds for the regions in question, within these galaxies.

We will endeavour to expand on all these points and more, in depth, in the course of this book.

The Contemporary Forces of Physics

In contemporary physics the four forces are:

- Strong, weak, electromagnetic and the gravitational.
- The strong force is the strongest of all. It is responsible for holding together the protons and neutrons as well as the quarks that go to form the protons and neutrons.
- The weak force is the weakest of all affecting all matter particles but not those particles that carry forces.
- The electromagnetic force is the one that arises between electrically charged particles. It is the second strongest force.
- The gravitational force is the third strongest force – always attractive.

From Microbits to Everything

How are the forces explained in terms of microbits? Firstly, there is a seamless, yet rule governed interaction between the so-called four forces but we shall split this seamlessness for analysis.

The Gravitational and Electromagnetic Forces: Explained by Microbits

The weak and strong forces are easily explained by microbit theory: The quark interforce in an atom is made up of essentially microbit groups (quarks) that have a stickiness that forms the nucleus of an atom while the ensemble collective adhesive force is the strong force. At some level, (we hypothesize at the level of the smallest particle, the microbit)[18], there is actual contact and sticking when

[18] All particles are surrounded by microbit-comprised smaller particles, except the microbit itself. (Refer to Appendix B). Take for example the hydrogen nucleus containing quarks. We theorize that quarks are both comprised of and are surrounded by smaller particles, which in turn are surrounded by and comprised of still smaller ones (presently undetectable, as they are much smaller than the electron and photon). At some level, the penultimate particle is surrounded by the microbits. The microbits are last in the line of particles in the chain from large to small, and their motion and innate stickiness is what 'glues' things together by dynamic collisions, imparting momentum and also recoil of the object of collision, due to the stickiness of the microbit. The degree of momentum and recoil inflicted on the larger particle that the microbit contacts and surrounds, is governed by the relative sizes of the microbit and the object it is colliding into and its speed of collision and other factors such as spin. Such motion eliminates action at a distance in a concrete way. At the micro-level, space is an extremely crowded place, though at our macro-level it appears exceedingly spacious! According to this theory, it is natural that quarks should have particles surrounding them and interacting to produce cohesion. In modern physics these are called gluons (though the details of how these move are different in microbit theory). According to microbit theory, the gluons in turn have other yet smaller particles surrounding them and are themselves comprised of smaller particles, and so on. In a sense then, the universe is comprised of particles that are essentially

the microbits collide, thereby producing a balance of forces, where the intercollisions produce a net force at each instant that maintains a motion of equilibrium between clumping and repelling. We do not know how many levels in the quark we may have to go down before we reach the smallest particle, that is, the actual microbit, since the microbit is so small. (See Appendix B for the structure of the quark according to the microbit model). The weak force is nothing but the disintegration of microbit packages due to instability conditions in the environment or in the object itself, that breaks the equilibrium.

But how are we to account for the gravitational and electromagnetic forces? The basic problem in physics is action at a distance. Consider the following question: Why do electrons repel each other? It is said that they do so is because they exchange photons. But why is there an exchange of photons? In conventional physics there is no answer for this, save mention of disturbance in the field which gives rise to 'virtual particles', a concept we will be critiquing later on in this chapter. According to the microbits view, however, none of the four forces would occur if there is no contact made between the microbits, at the level of the microbits themselves. In this view, the repulsion between electrons is based on the same principle as the attraction between 'gravity particles' that we call g-particles (instead of gravitons, in order to avoid confusion with other contemporary models of physics that hypothesize such an object). What is this principle though? The basic principle is that each subatomic particle is itself surrounded by the unit microbits or composite microbit particles. Whether an object is attracted or repulsed depends on the

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nothing but groupings or clusterings of microbits. We see an amazing analogue of this clustering in the way the stars are clustered in the macro-domain, up to superclusters of galaxies. The spheres drawn in this book to depict M-particles etc. are a simplistic representation for basic conceptual illustrative purposes only.

distribution, contact and dynamics of the microbits surrounding the interacting objects in question. Let us tackle gravity, by discussing the problem first and then a solution will be presented.

The Problem: Gravity and the Question of Infinities in Calculations

Where does physics stand today: Stephen Hawking explains very cogently that:

> Having obtained one renormalizable theory for the strong interactions and another one for the weak and electromagnetic interactions, it was natural to look for a theory that combined the two. Such theories are given the rather exaggerated title of "grand unified theories" or GUTs. This is rather misleading because they are neither all that grand, nor fully unified, nor complete theories in that they have a number of undetermined renormalizable parameters such as coupling constants and masses.[19]

He states that in order to see that the electro-weak theory is unified with the strong force, one needs greater energies than are present in laboratory experiments:

> If one extrapolates the low energy rate of increase or decrease of the coupling constants, one finds that the two coupling constants become equal at an energy of about 10^{15} GeV.[20]

[19] Boslough, John, (1985), *Stephen Hawking's Universe*, p.129
[20] Ibid., p. 129

The next generation of reactors will only be able to produce energies of about 100 GeV.[21] However, how would one be able to unify gravity?

One promising candidate had been N=8 supergravity that has twenty-eight spin-1 particles:

> These are sufficient to account for the gluons that carry the strong interactions and two of the four particles that carry the weak interactions, but not the other two. One would therefore have to believe that many or most of the observed particles such as gluons or quarks are not really elementary as they seem at the moment but that they are bound states of the fundamental N=8 particles.[22]

It ought to be noted that what Hawking is saying here is a statement that unknowingly touches on the borders of microbit theory. More importantly he states that:

> There ought to be something very distinctive about the theory that describes the universe. Why does this theory come to life while other theories exist only in the minds of their inventors? The N=8 supergravity theory does have some claims to be special. It seems that it may be the only theory:
>
> 1. which is in four dimensions.
> 2. incorporates gravity
> 3. which is finite without any infinite subtractions[23]

[21] Ibid., pp. 129 - 130
[22] Ibid., p. 136
[23] Ibid., p. 137

By four dimensions Hawking is including time as a dimension, but as the previous chapter explains, time is just a measure of motion and decay/growth in three-dimensional space. Hawking explains that the arguments as to why it makes good sense for a universe of two space dimensions not to exist is that it would have made the existence of complex organisms impossible. On the other hand, having more than three spatial dimensions would have caused orbital instabilities of planets and electrons.[24] (The main point is that three dimensions makes sense for existence; it is to be noted that one, two and more than three dimensions are mere abstractions, in any case, and cannot really exist).

However, since Hawking's address, delivered about two decades ago, due to problems of renormalizability, some physicists have gone on the wrong track to concoct elaborate theories that are based on multiple dimensions and abstract mathematics that try to evade the problem of infinity. The problem of infinity arises because contemporary physicists are not looking at reality in terms of visualizing concrete actions; the whole venture has become an abstract exercise in mathematical gymnastics and, because unlike microbit theory, in which the question of inifinities does not even arise, their models are based on conferring to microscopic properties the attributes of the macroscopic domain, in the sense that the inverse square law is thought to act to the level of the very small (point particles) whereas it is not being realized that it is an approximation of an ensemble of reactions taking place at the *sub-submicroscopic* realm.

What most physicists are ignoring is that we will not get infinities at submicroscopic levels of the microbit itself, because these inverse square law equations do not apply at that level, which is the level of actual contact. The universal gravitation equation –

[24] Ibid., p. 137

an inverse square law equation – is only valid for macroscopic objects, that is, vast assemblages of microbits interacting with each other, due to differentials (as shall be explained in detail) and particles larger than the microbit itself. Indeed, as there cannot logically speaking be *action at a distance*; contact is being made between the microbits, and there is no infinity involved as described by the contemporary equations. Self-interaction between microbits or microbit assemblages does not produce infinite energy because energy itself is nothing but a measure of the effort required to pull apart or put together the microbits, and the microbits, which are small and yet not inifinitely small, are not subject to the mathematical formulae developed for ensemble behaviour, which is based on an inverse square law. For this simple reason, one can bring two microbits together without creating or needing infinite energy. However, since the property of microbits is adhesion, splitting them apart in some configurations requires an enormous amount of work (i.e. energy). Similarly, even the adhesion of microbits and subsequent stability requires specific conditions and human created fusion (nuclear fusion) would not be an easy matter – however, we are not plagued by infinities.

We can see that the 'infinities' problem then, is indeed the central one in trying to come up with an adequate model for uniting gravity with the other forces where:

> …*self-interaction* is at the root of all difficulty encountered in attempts to formulate a quantum theory of gravity. It is possible, for example for two gravitons to exchange a third graviton between them, even while the original gravitons are being exchanged between similar particles. With multiple graviton exchanges brought into the picture, it soon becomes horrendously complicated, as we can

> understand by looking once again at the implications of the Heisenberg uncertainty principle.[25]

However, as we have discussed, the real problem is that certain erroneous concepts are leading to unnecessary impasses that physicists see as real impasses; they are based on wrongly directed models and assumptions, which naturally tend to bring about infinities. For example, "… a single electron can emit and reabsorb virtual photons [and these] processes produce a contribution to energy, and hence the mass, of the electron … leading to infinite mass, by calculations…" and dividing both sides of the equation they can side-step infinities, where "To make this still somewhat dubious procedure look respectable, it is dignified with a fine-sounding name – renormalization."[26]

Similarly, in quantum gravity, infinities arise when a quantum field process comprises a closed loop. According to the contemporary theories, with gravitons interacting, one would get infinities that would have to be divided by infinities. This process is indeed a very artificial one. Using supersymmetry, which then postulates the existence of other particles, e.g. with the gravitinos, one can cancel out the positive infinities with the negative infinities, produced by the gravitinos. The basic problem is that infinities arise since messenger particles with higher energies start to congregate nearer and nearer to particles of matter. Consequently, in this approach to physics, infinite quantities arise, as no limits exist to the proximity of messenger particles to the particles of matter from which they emanate. However, since the source particles are, in standard theory, mathematical points with zero size

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[25] Davies, Paul and Gribbin, John, (1992), *The Matter Myth: Dramatic Discoveries that Challenge Our Understanding of Physical Reality*, p. 241– 242.
[26] Ibid., p. 244.

(another abstraction with no basis in reality!), no limit exists to the energy of those messenger particles that are nearest.

In the book *The New Physics*, edited by noted theoretical physicist and writer Paul Davies, it is stated that if a model for gravity were based on gravitons, then such gravitons would scatter and interact with each other according to the non-linear term that would be obtained when a particular equation is substituted into the Einstein's field equations. These non-linear terms arise as an intrisic attribute of general relativity, and also because *all* energy produces a gravitational field, including the energy within the gravitational field itself![27] Attempts at using gravitons have thus been plagued with non-renormalizability (i.e. they cannot seem to cancel out the infinities). It has also been suggested that one of the prime equations used in the calculations, that is:

$$I = \int 1/x^n \, dx; \quad n \geq 1$$

should use the lower limit L_p (i.e. a cut-off at Planck length) when integrating. In other words, the integration should be from L_p to n, instead of from 0 to n. The reason is that if the distance is zero in the above equation, one gets infinities, but if it were a fixed length, then it would avoid the dreaded infinity.[28]

Due to the diversive path taken by physicists, some have developed a model called string theory. This is an attempt to circumvent the existence of point particles by extending them into strings:

> At low energies the strings move about as if they were particles, and so mimic all the qualities that have been

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[27]. Isham, Chris, (1989), "Quantum Gravity", *The New Physics*, Cambridge, Cambridge University Press, pp. 83 – 87.
[28] Ibid., p. 85.

> described so successfully by the standard theories for decades. But as the energy rises to the level at which gravitational forces start to become important, the strings begin to wiggle, and thus drastically modify the high-energy behaviour in such a way that the infinities are quenched.[29]

We can see that the route that has led to the phantasmogorical string theory has been taken because of false assumptions and a basically incorrect theory of 'matter and energy' based on the utterly fictitious conception of point particles. This latest attempt will not, therefore, solve the problems, namely, the mass-cum-energy fluctuations, as two 'point' particles get closer to each other, due to the 'uncertainty principle'. Here we have a good example of a muddled view, where both $E=mc^2$ and the uncertainty principle, as espoused by the camp of Niels Bohr, the indeterminists, and which has come to dominate physics, are used to draw erroneous conclusions. This is because string theory is trying to solve a self-inflicted problem of an abstract and artificial model of the universe, by getting even more abstract, even though the basic idea of the unity of 'forces' is correct, by smearing out a point into a line.[30] These theoreticians hope to solve the whole problem that destroys the renormalization process, but in the process they seem to be smearing out reality.[31] Recently, it was also shown that the inverse square law holds down to 218 μm, and that no deviations from Newtonian physics were found, as were surmised by some theoreticians holding on to string theory which postulates extra

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[29] *The Matter Myth*, p. 255

[30] Von Baeyer, Hans Christian, (1999), "World on a String", *The Sciences*, p. 12.

[31] The microbit model, we believe, lies behind the standard model of subatomic particles and not supersymmetry, based on strings.

dimensions at small scales. This test ruled out the large extra dimensions hypothesized.[32]

Though such abstract mathematical models may be useful in many aspects of operational calculations, (and indeed this is a blessing, for it has given us a lot of our technology) they do not adequately explain the unity of the integrated universe and the basis of reality, and, furthermore, would lead to a lack of progression or slowdown in such knowledge at a later stage because of impasses and wrong connections. Today's mathematicians and physicists must realize that an infinity is like a headache. If you have it in a theory you know that there is a problem in the basic ideas, just as a headache is symptomatic of a more fundamental problem occurring in the human body!

The Proposed Solution: The Explanation of Gravity by Microbits

According to the microbits model, gravity is explained by the difference between the amount of interaction of the microbit-comprised particles that surround and penetrate an object at different levels from the surface of the earth, to take an example. This is because every macroscopic object has g-particles (that is, particles made of microbits) surrounding it, and the density of these g-particles decreases as one moves away from the surface of an object. In other words, there is a differential in the density of g-particles as we move away from the surface of the earth (to use the earth as an example). The density variation is non-linear and follows the inverse square law. This means that one has more

[32] Hoyle, C.D. *et al*, "Submillimeter Test of the Gravitational Inverse-Square Law: A Search for 'Large' Extra Dimensions", *Physical Review Letters*, p. 1418.

density and more g-particles (which themselves are comprised of a combination of a specific number of microbits) acting on an object at a lower altitude above the earth's surface than at a higher altitude and since there is a differential, an object in this differential field would get pulled towards the earth (i.e you would feel weight). However, if two objects of differing sizes were dropped then they would fall at the same rate as our instruments tell us, because the rate of change in the g-particle density is non-linear (increasing as you get closer to the earth's surface) and the objects, being in the same gravitational field, would experience the same rate of fall because of the same *difference in the difference* between the microbits impinging on both objects.

Let us look into the mechanics of the gravitational force, by using an analogy, crude as it may be. Let us say that you have a block, and two men push it 5 feet south but then 8 feet north. On the other side you have three men who push the block 6 feet north but pull it 10 feet south. Where does the block end up with respect to its original position? It will end up 1 foot south. (5+10-6-8=1). This is how gravity works, but in the vertical domain, whereas the analogy is on a flat surface.

Now imagine that the block in example A is an atom's nucleus and the men are the microbitic g-particles bumping into the nucleus at zillionths of a second. They would have the net result of pulling the object downwards. Why though in this analogy did we say "two men push it 5 feet south but then 8 feet north"? This is because the property of microbits is adhesion and if one of them collides with the nucleus of an object, it imparts a 'momentum', but in rebounding it pulls the object in the opposite direction because of the stickiness. For example, to once again use an analogy, if you have sticky hands and try to let go of something on a table it may move in the direction of your hands until the bond breaks. So when a microbitic structure collides, it both pushes due to

momentum as well as pulls the object it collides into, with its rebound. We shall discuss elastic versus inelastic collisions, in depth, at a later stage.

Diagram 1

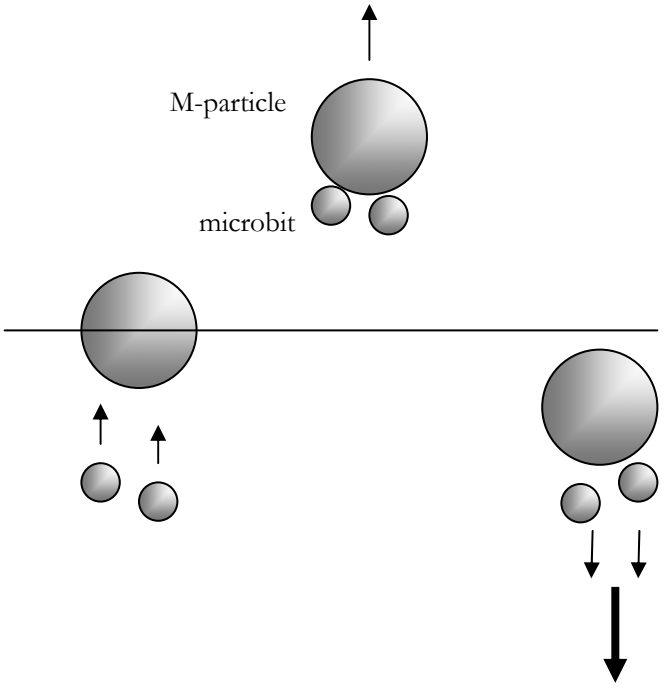


Diagram 2

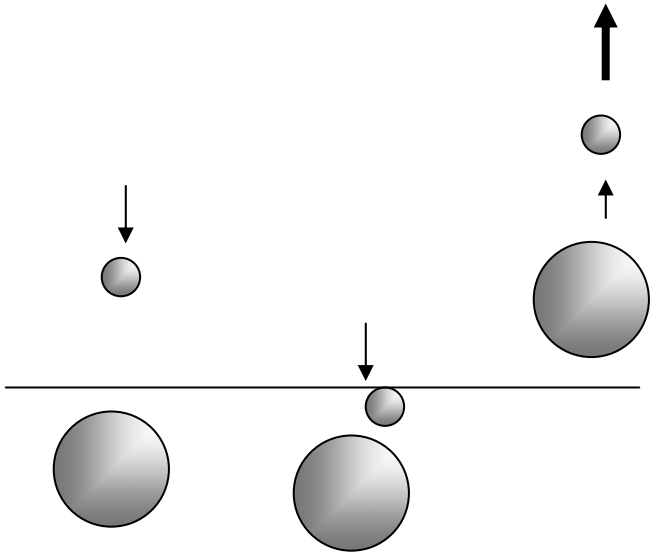
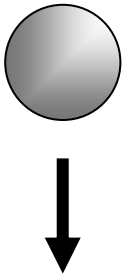


Diagram 3



Note that the direction of the ground is downwards in all these diagrams. An object is comprised of atoms which are comprised of neutrons and protons etc. and the protons are comprised of quarks, which are, in turn, in the microbit model, comprised of other yet smaller particles and so on

and so forth until we reach the level of the M-particle which is the smallest particle next to the microbit itself. There are no large voids in the M-particle because it is comprised of microbits (the smallest particle itself) and microbits do not have a field of smaller particles swirling around them. In the depiction above, the collision between microbits and the M-particle is shown. The net result of the forces pushes the M-particle down towards the surface of the earth. Since objects are comprised of countless atoms, hence countless M-particles the gravitational field, which is constituted by these, pushes the whole object – it could be an elephant, a book, or anything – downwards. (For the structure of the quark see Figure A, in Appendix B).

In Diagram 1, the M-particle that comprises the nucleus of an atom of an object, like an apple or a book, for example, is hit from below by microbits. Like a billiard ball, the momentum of the M-particle moves the atom upwards (away from the surface of the earth). But on the rebound the microbit pulls the M-particle downwards. On the other hand, when microbits collide into the same nucleus from above (Diagram 2), on the rebound the nucleus is pulled upwards. The net effect of the downward pull as shown by the first diagram is greater than the upward pull of the second diagram, and the net result is shown in Diagram 3 – a downward pull on the M-particle. Note that the relative sizes of the M-particle and the microbit are not drawn to scale and neither are the movements; the idea here is to explain the principles. Now if you have trillions upon trillions of microbits interacting in trillionths upon trillionths of seconds as a group (field) you get the attractive effect of gravity for objects on, stars, planets or large asteroids, etc.

The diagrams above isolate one atom and show how a few microbits act on it. However, it is to be noted that the microbits shown here would be part of the gravitational field that is comprised of g-particles, whose density decreases by the inverse square law. In other words the microbits we are showing in Diagrams 1, 2 and 3 are part of the fields surrounding the g-

particles (analogous to gravitons, although according to the microbit model, they have a different behaviour), for every particle, no matter how small it is, has a field surrounding it, including the g-particle. Since objects are comprised of countless atoms, what we see happening is that the net *downward* force of the *upward* acting g-particles is greater than the net *upward* force of the *downward* acting g-particles, and, because there are more upward acting g-particles than downward acting ones on the object as a whole (which is comprised of many atoms), the macro object falls down. Why does the object fall? Because the upward acting g-particles are at a lower altitude (closer to the earth) than the downward ones, and are therefore more numerous for every cubic measurement of space. Note that their distribution follows the inverse square law). *It must also be noted that all the g-particles exert an equal force on one another and there is a dynamical equilibrium among them, and they therefore do not clump-up into one big ball!*

To see how conclusions regarding what exactly gravity is, have been deduced, it would be worthwhile to consider the train of thought. Newton, it is claimed, thought of gravity when he questioned why an apple falls to the ground. What has led us to this gravitational theory is the opposite question – why does the apple not rise when it is cut from the tree or for that matter move sideways, parallel to the ground?

- Microbits exist as a necessary logical construct of the simplest and most elegant structure of reality in absolute space.
- The 'singularity', comprised of a finite number of microbits compacted together, is fragmentized or de-compacted in agreement with the general idea of the Big Bang origin.
- The microbit is not an abstract mathematical point but a concrete particle that has a finite albeit extremely small size. It

is the smallest of all particles out of which all other particles and 'forces' have developed.

- Microbits have the tendency to stick because they originally come from a whole and have intrinsic stickiness.
- As each particle formed from microbits residual fields around each particle formed.
- Therefore, all particles are surrounded by other smaller microbit-comprised subatomic particles, except the microbits themselves.
- When an object is in the vicinity of earth, it moves downwards towards the earth's surface.
- Why does the object not move up?
- There must be a preferred direction because of a difference.
- The difference must be a density in the microbits (in the form of g-particles).
- These g-particles are denser at lower altitudes from the object's surface. Call this the *gravitational gradient*.
- The differences are minute but they exist
- For movement of an object to occur downwards (i.e. to fall) there must be contact made by the free microbits within the object's atoms' nucleii (i.e. with the M-particle) of the particles that comprise the object, creating differential pressure on the object, i.e. *a microbit pressure gradient is set up,* forming the *gravitational gradient*.
- Therefore, in summary, because there are more microbits at a lower submicro-altitude than at a higher level (i.e. because there is a gradient) the motion of the object is downwards towards the earth (i.e. the object 'falls').
- Because two objects are in the same differential microbitic field and the differential pressure is non-linear, due to the gravitational gradient, any two objects will experience the same acceleration towards the earth.

- However, a denser object is comprised of more microbits and in such a field it will interact more than a less dense object and therefore we will feel a greater pressure downwards when we hold a dense object, than when we hold a less dense one.
- The implication of all this is that one could locally change the distribution or gravity field gradient of the microbitic particles around an object by 'electromagnetic' effects. This will be discussed in detail further on, in this chapter.

Galactical Rotation: The Solution for the Outlier Stellar Velocity Anomaly

A theory of gravity based on the microbit model, as described, has implications with respect to other motions such as galactic rotation in spiral galaxies such as our own. Based on conventional Newtonian Mechanics, applied to spiral galaxies, such as our own, and as one applies it to the solar system, one should expect that the velocity of stars far from the centre of the galaxy, for example, should have velocities that are lower than those near the centre, as the velocity is inversely proportional to the radius from the centre. However, in the rotation curves (i.e. velocity curves) of stars, one does not see this trend – the velocities of the more outlying stars are unusually high. If we apply the microbit theory of gravity, the reason why the velocities are unusually high for the 'outliers' is because all these stars are falling towards the centre at a higher rate than that dictated by the Newtonian relation R (radius) from the centre of galactic rotation – that is, they have an acceleration that does not drop with an increase in radius R, because the g-particle density pattern spread across the disc-like galaxies would diminish more or less linearly in density from the centre of the galaxy, producing differential forces leading to the similar magnitude of

inward acceleration of each star. This would lead to non-decreasing velocities (a flat rotation curve), and one would not need any 'dark matter' (i.e. the missing mass) halos interpenetrating such galaxies, to explain the higher velocities to satisfy the equation, here put in terms of acceleration, where R is the acceleration from the galactic centre:

$$GM(R)/R^2 = V^2(R)/R$$

In our case, the 'dark matter' is just gravity, which, we are saying, is comprised of particles and not curved space or 'action at a distance', and these particles 'behave' in a particular way and have particular properties as described in the book.

According to the new model for gravitation being presented in this book, the general shape of the density profile for the g-particles spread across the galactic disk of typical spiral galaxies wo-

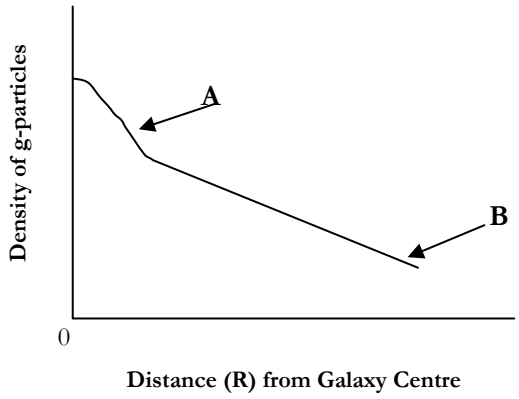


Fig. 1

uld look like the one shown in Figure 1. Consequently, if the density profile for the g-particles is as such, then the density profile of the stars will also be similar, (though perhaps not an exact correspondence), since, where there are more stars, there are more g-particles.

But why does the graph above have the shape it does? If one recalls, as one moves away from the surface of the earth, the g-particle density drops. The force on objects in this field is a result of differentials. Similarly, all stars, of course, also have there own individual g-particle gradients. Furthermore, all objects in the universe are interconnected, and all stars in the galaxy are interconnected like an intricately woven fabric. The interconnectivity occurs through the g-particle gradients, in the sense that, for example, stars are in clusters because of mutual gravitational attraction. Their g-particles are intermeshing. Obviously, the more the stars the more the intermeshing. This means that the sun is affected by a g-particle gradient itself from the other stars. The sun, in other words, is being pressured or forced or is falling into the centre of the galaxy with a certain acceleration, but is prevented in doing so, because it has a straight-line tangential motion as well, that is a remnant of the motions set off and continuing since and because of the Big Bang. We can apply this finding to all stars within a spiral galaxy and the conclusion is as follows: Since the velocities show a flat rotation curve (i.e non-decreasing velocities as one moves away from the galactic centre), except for the central region where the galaxy is behaving as if it were a solid disc – and in a solid disc the velocities would *increase* as one moves away from the centre – the density profile of the g-particles would be as depicted in the graph above, from the centre to the edge of the galaxy. Why so? On the portion of the curve designated as "A" in Figure 1, the g-particle density drops rapidly: in other words the stars in the central region increase

in velocity because the g-particle density not only drops but its rate of 'droppage' increases. In other words the differentials are larger (where the differentials are the slope of the line at any point on the graph of Figure 1). So if, as you move further away from the centre, the differentials are increasing, it means that the acceleration is increasing, and if the acceleration is increasing, the velocities are increasing, since the relationship between acceleration and velocity is not $a=v^2/R$ but rather, a is directly proportional to v, but independent of the distance from the centre of the galaxy to the star, that is, there is no 'R' as per this equation relating acceleration and velocity, because the microbit theory of gravity works on differentials in the local neighborhood directly impinging on the object under consideration. This is the region A in the graph.

As we move out further, the velocities are more or less the same and they do not drop according to the application of the Newtonian equations, where the Newtonian equations for gravitational forces hold that velocity is inversely proportional to the distance between the star and the centre of the galaxy (the inverse square law). This is because, the motion of the stars is still governed by the differentials as discussed before, and not from the distance 'R' from the galactic centre or centre of mass based on the simple application of the inverse square law relation. To illustrate the solution, let us say that the total number of g-particles is 15 on one side of the sun and 10 on the side farther away from the centre of the galaxy. The net difference is 5. Similarly, take another star, even further out from the centre of the galaxy than our own sun. And assume that on one side, closer to the center of the galaxy, the density of g-particles is 10 and on the other side it is 5. The differential will again be 5. Therefore, differentials for all stars in this region drop *linearly*, as designated by the "B" portion of the density curve. This linearity is an emergent or composite property of the non-linear inverse square law distribution of g-particles from

each individual star. In other words, the emergent effect is that all stars in region B face the similar acceleration values and hence the non-decreasing velocities (i.e. a flat rotation curve).

The reason why the inverse square law works for the solar system, but not for stellar rotation is because the g-particle density drops as shown below in Figure 2, for our solar system. This relation shows that the density is inversely proportional to the radius. In other words, acceleration is inversely proportional to radius. From this, obviously, one derives the classical inverse square law relation for forces between two objects.

Fig. 2

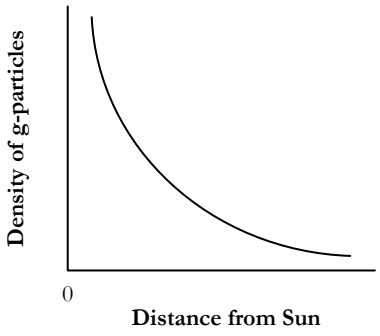


Figure 2, in other words, shows *decreasing* velocities as we move out away from the sun as per the equation, in consonance with the equations derived by Newton, Kepler et al, that stipulate the inverse proportionality relationship between radius, R and velocity. Since, however, the Newtonian equations are based on "action-at-a-distance", there has been no consideration that underlying all this could be gravitational gradients, comprised of particles that produce the differentials that we have described in this book.

Given all these considerations we deduce that stellar mass distribution, that is, the density of stars, must be similar to the g-

particle distribution within the galaxy (density). This is because the greater the density of stellar matter, the greater the surrounding g-particle field. If the stellar density drops, either in terms of the density of stars in a given volume of space, or by the decrease in the mass of each star, then the g-particle density will also drop. Note that the g-particle density in Figure 1. is shown from the centre of the galaxy outwards, towards its edge. The total g-particle density for the galaxy is therefore the emergent or additive g-particle density distribution for the galaxy.

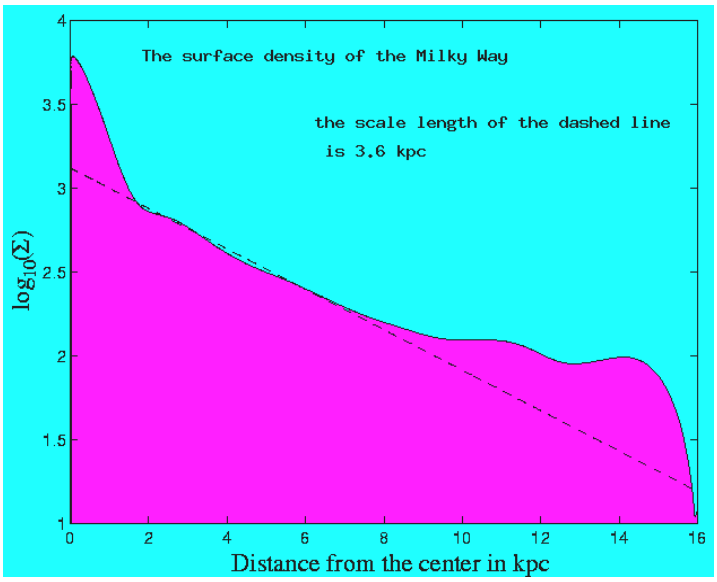


Fig. 3

In fact, that this is indeed likely the case is shown by, for example, the Milky Way galaxy in the Figure 3[33], though in this

[33] This figure is one which is based on the corresponding one in the paper of M. Mizony *et al* as cited in footnote 33, and is obtained from M.

case, dark matter is being added to explain the flat rotation curves. This graph is the finding of D. Méra of the Centre de Researches Astronomiques de Lyon, M. Mizony and J. –B. Baillon of Institut Girard Desargues, University of Lyon, who determined the disk density profile of the Milky Way Galaxy, with – unlike the microbit model's gravitational theory with zero dark matter – the dark matter distributed in 2D within the galactic disk itself, based on observational data on our galaxy's rotational curve.[34] The mathematical model they use computes the surface density of the disk that gives rise to the observed rotation curve. This new technique matches expected density profiles of well-known types of velocity curves that is, an exponential disk, a Keplerian rotation curve, and a constant rotation curve (Mestel's disk).

In the model based on the microbit theory of gravity, described in this book, we are dealing with differentials of g-particles, where the radius from the centre of the galaxy to the star in question, in terms of the validity of using the inverse square law is not relevant, though one can still derive a new equation based on R, related to the shape of the graph in Figure 1. Furthermore, this new theory of gravity does not require any dark matter. This prediction of the microbit gravitational theory is borne out by observational-cum-mathematically modelled density distribution as per Mizony *et al*, using their rigorous method. The dark matter hypothesis, is, according to microbit theory, a redundancy – as redundant as the epicycles of pre-Copernican geocentric theory. We certainly believe that further research will corroborate and entrench this view as a fact. The interesting and key thing to note is that the density distribution discussed in Figure 3, arrived at by

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Mizony's website at: http://www.desargues.univ-lyon1.fr/home/mizony/milkyway.gif

[34] Méra, D., Mizony, M., Baillon, J. -B., "Disk surface density profile of spiral galaxies and maximal disks". This paper was submitted for publication to *Astronomy and Astrophysics*.

Mizony et al, with the new mathematical technique by J. –B. Baillon, reveals a density distribution that has the same profile as the effect of the gravity field according to microbit theory (see Figure 1), but without any dark matter!

Recently, it was reported that astronomers had detected at least 3% of the presumed halo, in the form of white dwarf stars. However, some of these stars may not actually belong to the halo, for they are found in the disk region. Due to their faster speeds, compared to typical disk stars, they are assumed to be just passing through the disk, from the halo itself.[35] Although there is a tremendous amount of 'stuff' to be found in our galaxy, given our assessment using the new gravitational theory based on microbits, which essentially deals with the nature of the gravitational field in terms of particles within the disk itself, we do not believe that the massive halo exists, in terms of cold dark matter, or other forms of dark matter.

The gravitational theory we are expounding is contextual in nature and is based on differentials (profiles) in the density of g-particle distribution. And because of the basic law of g-particle motion as described in this chapter, it is not *ad hoc* or 'cooked up' for any situation, but rather, it is universal. Our theory either stands or falls because of its universal claims of the structure and motion of microbits. This theory cannot be altered haphazardly to explain any possible concrete evidence of a fundamental nature that may go against it, if we are incorrect. On the other hand, with experimentation, one may find minor variations with our theory, or some aspect of it might be proven to be incorrect (though, at this stage, we do not think so), but in such a situation a particular hypothesis with respect to details only may be incorrect, but not

[35] Sincell, Mark, (2001), "Astronomers Glimpse Galaxy's Heavy Halo", *Science*, p. 2293-2294.

the whole fundamental theory; the theory in such a scenario would thus have to be refined.

Recent Experiments on Gravitation

Professor G. Modanese stated in a speech to the 48th Congress of the International Astronautical Federation held in Torino, Italy, 5-10 October 1997, Dr. E. Podkletnov created "weak gravitational shielding" by a YBCO HTC disk which caused a diminution of *g* (acceleration due to gravity) by approximately 1%. The disk was (14-27 cm in diameter) and *it was spinning up to 5000 rpm while levitating in at temperature of 70 K*. A high frequency magnetic field was applied (up to MHz). The result was a vertical, cylinder like shielded region above the toroidal disk where gravity had been reduced! Unfortunately, since that claimed discovery, the effect has not been reproducible and for political reasons, Podkletnov himself, at the last minute, withdrew Podkletnov's paper, which was scheduled to be published in a prestigious scientific journal, even though he did not deny the effect, or change his story on what had happed in his lab.

In his speech, Modanese went on to explain that Classical General Relativity does not explain such effects. He thinks that the effect can be explained by quantum gravity; however, we believe that the effect can be explained by standard mechanics in flat space albeit operating on a smaller scale and level, where the particular stickiness, size, rotational properties of the microbit particles and their assemblages would also come into play. If the g-particles are reinforced by the electromagnetic effects, or their motions altered, then they would exert a greater net upward pressure than before, thereby creating the shielding. We would like to, therefore, at this juncture, suggest the future study of *microdynamics*. In microdynamics, one is actually dealing with actual particles

interacting, colliding, dispersing, rotating etc. just as one would on the macroscopic scale, although the properties of microbits would create some differences in detail between this micro and macro level. Any global, geometrical models to explain the collective behaviour of phenomena are just models to explain the actual concrete interactions taking place by and among microbits, and this is why we ought to aim for an explanation using microdynamics.

Physicist Modanese explains further, in an internet report, part of which is quoted below, entitled *Gravitational Anomalies by HTC superconductors: a 1999 Theoretical Status Report (The Gravity Society - www.gravity.org)* that:

> According to General Relativity – our best present theory of gravity– the dynamics of the gravitational field and its coupling to the mass-energy-momentum density which generates it are described by the (classical) Einstein equations. These are non-linear partial differential equations involving the components of the metric tensor and its first and second derivatives. They are similar, under several respects, to Maxwell equations, though more complicated and non-linear.
>
> In very simplified terms, we can say that Einstein equations allow to find the gravitational field as a *response to a source* – linear in a first approximation, or non-linear in the presence of strong mass-energy densities. The proportionality constant between field and source is of the order of the Newton constant G for linear responses and even smaller, of the order of G/c^n, for non-linear responses. There exist static fields and fields propagating like waves, but in any case their strength is related to the mass of the source which has generated them.

The only sources close to us which are massive enough to generate a detectable field are the earth, the moon, the sun and, to a smaller extent, the other planets of the solar system. Any other object or physical system available on a laboratory scale, irrespective of its chemical composition or microscopic structure, generates gravitational fields of exceedingly small strength. These fields can be detected through very sensitive instruments, but they are typically of the order of 10^{-9} *g* or less (g=9.8 m/s^2 is the field generated by the earth at its surface).

These observations are well known and lead to the conclusion, in full agreement with Einstein equations, that the gravitational field generated by a very massive field is in practice unaffected by the presence of any other body whose mass is much smaller. In particular, it does not seem possible that the gravitational acceleration *g* at the earth surface can be affected, through any human-sized apparatus, by more than approx. 1 part in a billion.

The conclusion above rests, as mentioned, upon the hypothesis that the equations of classical General Relativity are appropriate to the situation.

It is known that quantum mechanics brings in some very small corrections to the classical equations of any field, including the gravitational field. In the quantum view, the field oscillates in an approximately harmonic "potential"; these oscillations take place around a minimum value corresponding to the classical field strength.

Usually the quantum fluctuations are irrelevant on a macroscopic scale. One can show, however, that the presence in a region of space of coherent vacuum energy ("zero point energy") modifies the potential in which the

> gravitational field oscillates. Zero point energy is present in macroscopic systems – that means, systems well above the atomic scale – which are described as a whole by a single wave function. If the zero point energy term was present uniformly in all space, it would not bring any consequence: the gravitational field of the entire space would react exactly in such a way to reset the zero of energy. Things are different, however, if the zero point energy term is present only in a well-defined small region of space; in this case it produces a localized instability …

Another important issue discussed by Modanese is the compatibility between the shielding phenomenon and the equivalence principle:

> Imagine a box divided in two sections 1 and 2. Suppose that the lower part of the box, with mass m_2, contains a shielding apparatus, complete with power supply generator and everything. Now let the box be in free fall. If "the shielding is OFF", the acceleration of the box is equal to g.
>
> Then you "turn ON" the shielding, say with efficiency α; this means that the gravitational force felt by the mass m_1 over the apparatus is multiplied by a factor $\alpha<1$ (for instance, $\alpha=0.98$). Let us admit that the weight of m_2 itself is not affected.
>
> It is easy to see that in this case the acceleration of the box becomes less than g. This is actually what desired, if we aim at building a flying machine. It means, however, that the gravitational mass and the inertial mass of the box are not equal, any more. And this represents a violation of the equivalence principle.

> Note that the box is supposed to be isolated from the environment: it does not expel any jet of air or gas, nor it interacts with any external electric field, etc. In these conditions of free fall, one observer inside the box should experience total absence of gravity. He doesn't, however, if the shielding is ON. He feels some gravity, because its acceleration is lower than *g*. This, again, shows that the equivalence principle is violated.
>
> If we do not accept the possibility of such a violation, we must admit that the shielding effect does not work like this. We must admit that if the shielding apparatus is rigidly connected to the Earth, then there is effective weight reduction of the samples suspended over the apparatus; but if the whole shielding apparatus is in free fall, then a reaction force from the samples on the apparatus arises, which makes the total weight variation vanish.
>
> This means of course that it is impossible to build a flying machine using the gravity shielding effect. It is still possible however, in principle, to build a "lift".

With microbit theory, however, there is a possibility of, one day, making a flying machine as depicted above, as the artificial constraints of Einsteinian relativity are not there.[36] In such an experiment as Podkletnov's what we think is happening, according to the basic concept of microbits, is that the effects of the cryostat, rotating disk and the electromagnetic field are together producing a reinforcement of the differential in the gravitational field above the

[36] G. Modanese hypothesizes in a paper posted on the internet, dated June 15, 1996 and entitled "Theoretical Analysis of a Reported Weak Gravitational Shielding Effect" (which was scheduled for publication in Europhys. Lett.), that the Podkletnov effect may be explainable by "non-perturbative Euclidean quantum gravity."

disk by changing the g-particle gradient. The repulsion is not emanating from the disk alone but from the magnetic field coupled with the particle behaviour in the rotating disk that is, of course also connected with the precisely controlled temperatures in the cryostat. In effect, the electromagnetic field's density above the disk together with the g-particle density produce a situation where the total gravitational gradient in the localized region is changed, producing a diminution of gravity in the cylindrical region as described by Podletnov. Now, even if it turns out that Podkletnov was erroneous in his measurements etc., or that the whole experiment was fraudulent, what we are claiming, nonetheless, irrespective of the experiment, is that it is possible to use electromagnetic fields in some manner, hitherto not definitively established, to produce even rising objects or objects that move horizontally if one is able to change the gravitational gradient from the normal one that surrounds the region of the earth or planet where the experiment or experimental contraption resides. Microbit theory makes this possible, whereas General Relativity does not. To understand the interference that could occur in the gravitational field composed of microbits, or, more specifically, of the g-particles, one needs to consider electron repulsion.

Electron Repulsion

There is a possible explanation for electron repulsion using the microbit model, verifiable through experimentation. The first is a radical departure from standard explanations: To follow on from the analogy, used to describe gravitation, say that a block is an electron and the men are microbits, and let us say that you have men who push a block A, 3 feet west and then zero feet east and another group of men who push block B, 3 feet east and then zero

feet west. The net result is that both blocks are now 3 feet west and east respectively, in regards to their original positions – a total of 6 feet apart.

As far as electron repulsion goes, consider two electrons coming in proximity to each other. As two electrons (i.e. block A and B) are brought together, the activity of microbit movement surrounding each electron increases, especially at the sides P and Q. However, the opposite happens here in contrast to gravity, because the two electrons are equal and the interactions at P and Q are also equal. Furthermore, when a microbit collides with an e-particle (which comprises an electron), it imparts a momentum in one direction (3 feet west in our analogy) and then as it retracts it pulls the electron the other way (zero or a few inches east). However the initial momentum in one direction (the push) is greater than the pull (3 – 0 = 3) and this is why the two electrons are repulsed. It is this pulling and pushing of the surrounding microbits or their composites that causes electron repulsion; however, the principle of momentum and retraction (given the stickiness factor of microbits) remains the same. It is just that in the case of gravity, as discussed above, the pull is greater than the push. We shall be considering the validity of such collisional motion in terms of elastic and inelastic collisions, later on in the chapter.

In Figure 4 below, the net effect is a repulsion. When the two large spheres (electrons) are brought close to each other, the smaller particles surrounding them (the smaller spheres) collide and retract by momentum (1a and b), the collision pushing the spheres away being greater than the pulling of them together by the recoil of the smaller spheres. The final result is shown in 1c. *If a gravitational field is permeated by an electromagnetic field in the right way it will cause a change in the existing gravitational gradient of the g-particles. What that right way is, still needs to be determined by experimentation.*

As the reader will note, this explanation of electron interaction radically differs from the current ideas:

> In the classical theory of electrostatics, the inverse square law … is described in field language by saying that the charge e_1 creates an electric field of force around it, and the charge e_2 interacts with that field at a point a distance r away. It is the interaction between e_2 and the field that produces the force. If e_1 were disturbed in some way, the effect of this would be transmitted to e_2 through the field, and e_2 would respond accordingly. In quantum theory [however] … the disturbance .. [is] .. in the form of photons. When e_1 is moved, it emits photons which are subsequently absorbed by e_2, causing it to move also. The electromagnetic force is therefore described in terms of the *exchange* of field quanta, acting rather like messengers, between the sources.[37]

In contemporary physics, the force that causes repulsion is a virtual particle that arises from an electron and then is re-absorbed by another electron. It is assumed, by such a motion, that the problem of action at a distance is resolved. Since the law of conservation of energy is violated by the emergence of the virtual particle, physicists claim that the violation occurs in a timespan so short that it is not measurable. This energy, it is further claimed, is 'borrowed' and repaid quickly without anyone knowing about it and that, therefore, no real violation occurs. This argument, however, is very illogical: If we do not measure something, it does not mean that it does not exist, and yet this is what modern physics would have us believe, based on quantum mechanics. In terms of this type of 'borrowing', it is a relief that modern physicists are not

[37] Davies, P.C.W., (1982) *The Accidental Universe*, pp. 16 – 17.

in charge of enacting social laws, for if the same logic were used, I should be able to legally withdraw someone else's funds from a bank without the account holder or anyone finding out and then re-deposit them, likewise, back into the account without anyone finding out!

With microbit model we do not postulate the emergence of virtual particles out of the blue. According to the new model that is being proposed, the reason why electrons repel each other, based on an inverse square law relation, is because each electron is comprised of smaller particles (similar to the quark model; see Appendix B, Figure A) and the repulsion occurs due to the net contact and dynamics of the collisions of the microbits themselves. The net result of these collisions is a repulsion of the 'electron' (see Figure 4). Since the density distribution of the microbits and other composite particles drops, based on the inverse square law relationship, we see the force that we do, in both electrostatics and electromagnetism.

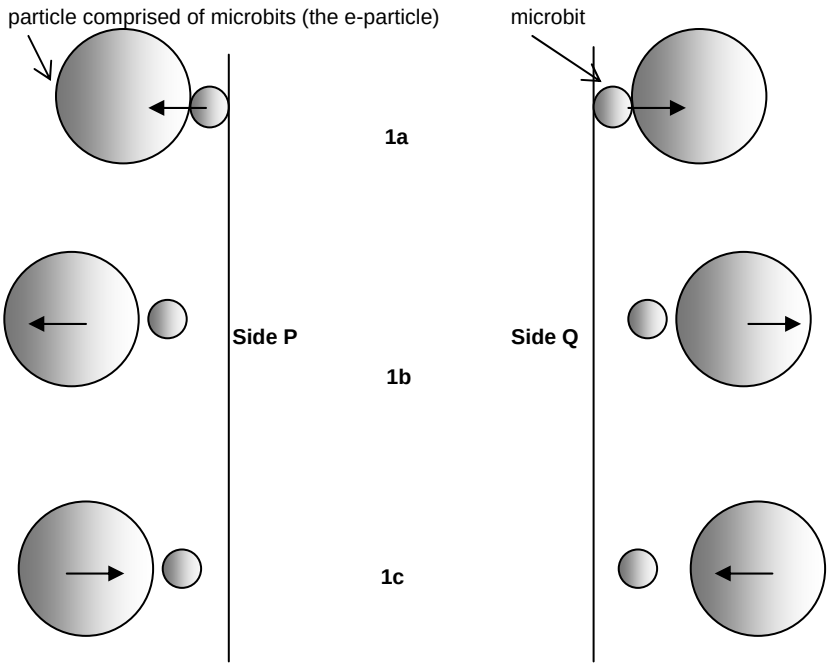

Fig. 4

Figure 4 is a depiction of the smallest two particles *that are part of the electron*. The electron is divisible, in other words, into smaller and smaller real particles. At this stage, we do not know how many levels we would have to go through to reach the microbit itself, and the penultimate particle (second smallest particle *in* the electron), call it the 'e-particle', for ease of reference. The e-particle is comprised of many microbits and it is, additionally, surrounded by many microbits, dropping off with an inverse square law density distribution from the surface of the e-particle, though only one such satellite particle is shown here. There is collision and retraction, where the collision pushes the e-particle (in 1b) farther than the pulling it (1c). This outcome is a result of the 'stickiness' of the microbit. The net result is that the e-particles get repulsed (compare figures 1a and the final outcome as shown in 1c). The electron, in short, itself is comprised of many e-particles and the net result on the electron is that it is repulsed. On the macro-level we see the inverse square law relations, described mathematically. There are no virtual particles in the microbit

model; only smaller underlying ones, out of which the larger ones are comprised.

Electron Orbits

The electrons orbit the nucleus for the same reason as the planets orbit the sun. Essentially, the nucleus of an atom is surrounded by smaller microbit comprised particles whose density decreases as you move away from the surface of the nucleus. The electron is held in orbit because its own microbit particles' field interferes with that of the nucleus and because of the same reason that an object is attracted by gravity (the 'gravitational gradient' as explained above) it is pulled towards the nucleus. However, the force is not so great as to pull it completely into the nucleus and its free motion to breakaway from nucleus capture is balanced by the pulling microbitic force working in the differential microbit field and the result is that the electron orbits the nucleus at specific distances from the centre of the nucleus. In essence, every nucleus sets up a *micro*-gravitational gradient, like a planet's gravitational field (and gravitational gradient) and an electron becomes a satellite.

Some Microbit Properties

- *Conservation of Microbits: The Prime Law*
  Microbits cannot be destroyed unless the universe collapses to the initial 'singularity'. They are conserved. For example: when an electron and positron collide according to contemporary physics you get:

Electron + Positron = Photon 1 + Photon2

Microbits as a New Model for Physics

The interpretation of microbit theory is different: there is no anti-matter only anti-motion. The *prime law is the conservation of microbits* and concomitantly the conservation of momentum/energy. According to this view, the electron exhibits the properties of a photon, upon collision with a 'positron'. In fact, we believe that its rotational motion (spin) changes. By spin we mean actual spin (with spin rates and axes of spin) and not some abstract formulation based on quantum mechanics where the axis is not well defined. The electron is an extended object and an extended object is not a dimensionless point, as it is taken to be in contemporary physics. It has a structure and its own particular motion in 3D space. An object such as this either has a spin, has no spin, or has a complex or erratic motion. It must, logically speaking, therefore have some type of 'self' motion, based on its structure and the environment it is travelling through, which may or may not affect this motion. Microbit theory is stating that the present mathematical models are only operational, and that the universe is deterministic. In quantum mechanics we only get certain aspects or glimpses, based on equations. Yet the fact is that an object cannot be a point or, in other words, dimensionless, if it exists. But then how do we account for the fact that most physicists are imbibing this illogical idea? To understand this, one has to step back and realize that their position has to do with the educational system that has been a victim of historical events. In Western Europe, many people had counter-reacted against the irrational and superstitious teachings of the Church during the European Dark and Middle Ages. Eventually, Logical Positivism arose, which stipulated believing in something only if one were able to measure it. Because, due to the state of our experimental technology, some things were not measurable simultaneously

(i.e. velocity and position), it was concluded, irrationally, that because one could not measure such properties, the particular properties of the object being studied would not have intrinsic existence until measured. In other words, Heisenberg's uncertainty principle was given a false property of being the decider of ontological status, rather than a mere operational and mathematical tool. In the 20th Century, this view has become the dominant one, and has been institutionalized. With such irrational institutionalization, we have the problems of rigid perceptions, or honest misperceptions due to not questioning what is being taught and so on. This mindset leads to views being presented in this book, for example, as being criticized for not sticking to standard textbook assumptions and equations, many of which, as we are pointing, out have an historical basis of erroneous assumptions.

According to microbit theory, the collision between an electron and a positron, the rotational energy of the colliding positron and electron get transferred into linear energy which results in an increased speed and the identification of it being a 'photon' (though in reality it is just a speeded up electron). Microbit theory leads us to the conclusion that the electron speeds up to the value of *c*, in such situations. However, the normal phenomenon of light, in microbit theory, is not based on speeded up electrons; it is based on our *activational pulse transfer model* for photons in space, to be described in subsequent sections in detail.

- *What is mass?*

  Mass is the total "stickiness" of the microbits of one object interacting with another. We use our conventional scales to measure this.

Microbits as a New Model for Physics

- *What is energy?*
  A human conventional measure of the amount of effort required to move or break-up microbitic structures on/of various sizes/levels.

- *What is time*
  Human convention to measure, using equal intervals (motions), the transformation and/or movement of microbits in absolute space.

- *What it negative and positive*
  When an electron comes across a proton, does it see a sign saying + and itself as – ? Obviously not, since its attraction to the proton is a structural and motion based issue related to form, function and process in three-space, not subatomic placards!

Inelastic versus Elastic Collisions at the Microbit Level

On the issue of elastic versus inelastic collisions: When two objects collide, an elastic collision conserves both energy and momentum, whereas an inelastic collision does not conserve momentum. Does not the collision of microbits as described when discussing gravity (g-particles), or the basis of the repulsion of electrons violate these laws in the sense that they are both elastic and inelastic collisions at the same time? Usually, when objects collide, they may stick together and travel in one direction (an example of a perfectly inelastic collision) or, they may hit each other and both recoil, preserving momentum and kinetic energy (a perfectly elastic collision). On pages 45 to 50, however, we have an example of

microbits colliding inelastically and then recoiling elastically, also shifting the object that they collide into, into the opposite direction. To see why this does not violate the law of conservation is to go to the root of what the law of conservation is all about. Firstly, as stated previously, no microbits are lost. None of them vanish. This is the basic law of conservation. Secondly, all the laws on the macroscopic domains are a result of the motions of the microbits. The inverse square law is a result of the inverse square density distribution in absolute space of microbits and other larger particles. *If the microbits themselves define and form gravity in this way, how can they be subject to gravity, or to the acceleration due to gravity?* It is indeed a fallacy in thinking, given the stated structure of the microbit model, to assume that the term *'m'* for mass in the standard energy and momentum equations applies to the microbit itself, and that the reactions should follow the conservation rules, in terms of elastic and inelastic collisions based on such equations for the microbit as well. The basic properties of the microbit are its size, its indivisibleness, its stickiness and its 'bounciness-cum-springiness' or deformability upon collision; then it moves according to the environment it is in. In conclusion: *No momentum or conservation laws are violated because the microbits form these laws themselves at the level of particles* larger *than the microbit, due to the nature of their distribution in absolute space.* The reason why, on the macro level we either have elastic *or* inelastic behaviour is because energy is dissipated. But at the microbit level, the microbits' motion, which is the basis of *all* energy, no such dissipation occurs because the microbits are not lost, but only collide and move away from each other. When they do collide, they 'stick', but this is not the 'glue' type of stickiness. The 'stickiness' means that when they do collide, there is not gap between their

surfaces; at the point or region they are perfectly joined. The two microbits then break up due to their 'bounciness' which puts an end to the brief co-joinment.

Possibility of Causal Effects at Light Speed *c*

Nothwithstanding Einstein's conceptually problematic theories, which are only an operational tool at best, there has been an awareness among many physicists that gravity and motion have actual and similar physical affects on objects.[38]

We state that only objects that move at substantial speeds are subject to the greater relativistic effects approximated by Einstein's equations because they are influenced by ambient microbitic structures in absolute space (the drag factor M. Muslim discussed in the last chapter).

There must be a cause and effect deterministic relation between things. Either the effects of the experiments are erroneous/misinterpreted or there is a *real* change on the structure and motion of the objects as they move through space, which is not empty but contains many particles, at the lowest level of which are the free remnant microbits. If the effects due to motions at near light speed are real, then we have the following interpretations:

- As an object's speed increases in an accelerator, the energy required increases (so it *appears* that mass is increasing).

- In a lower gravitational field there are more microbits and clock mechanisms of atoms/quartz etc. would move slower

[38] Renshaw, C.E., (1995), "The Effects of Motion and Gravity on Clocks", *Aerospace and Electronic Systems*, IEEE.

because there are more microbitic interactions with the atoms that are set to measure time. The increased interactions with the microbit formed particles (g-particles) are more numerous at lower altitudes from the earth's surface. This helps slow down the rate at which these particles oscillate (i.e. there is a drag factor).

- The stability or internal cohesiveness of a particle increases the faster it moves through a microbit field and its shape may change due drag factors. This is because space is not empty, but extremely crowded as we have learned, leading again, to subatomic clock slowdowns, due to oscillatory slowdowns of particles used in such atomic clocks, with increasing speed.

The Universe as a Binary System

Another implication of microbits is that if the universe is ultimately made of one type of particle, then it means that the universe is really akin to a binary system. How is this possible? If the smallest particle is the microbit, then it means that if we assign its presence a value of 1 and the absence of it as zero, one could describe all events and processes in the universe in terms of one's and zero's.

Explanation of the Wave/Particle Duality and Standing Waves using the Microbit Model

Is light a wave or a particle? In the double slit experiments on light, when one slit is open, one sees that light behaves as if it were a particle, as the distribution of the photons arriving on the target

screen primarily land diametrically opposite the opening in the first screen, through which these supposed particles pass. Yet when *both* slits are open, instead of two bright areas of 'photon landings' on the screen mostly distributed directly opposite to where the two slits are, we get a wave-like statistical landing pattern. In other words, when a single slit is open, light appears to behave as a particle, but when both are open, it behaves like a wave.

Can we explain this anomaly using microbits? What we are claiming is that light is manifested by activation or agitation of existent microbits from a source, which then transmits a pulse of energy *hv*. Since space is crowded with passive photon particles that are lined up between the observer and the objects being observed, the quantized pulse agitates or activates neighboring photons, which, in a chainlike or wave-like motion, agitate neighboring ones, thereby transmitting a *directional* pulse from one reverberating photon to the next. In other words, the photon does not travel from source A to the destination source B. It is only a pulse that travels from A to B along straight line, by activation of neighbouring particles. In short, one can say that light comprises of the activation of photons along paths. It is, therefore, only an illusion that individual photons traverse from A to B.

What appears to be happening in the double and single slit experiments is that when one slit is open, there is a transmission of the pulse agitating a path of photons in a straight line, from the source to the target screen. However, when both slits are open, the activation of the sea of photons by the quantum pulse of energy hν generated *in* the source is such that the alignment of these photons is not only altered as before, that is, as when there is only one slit, but in addition, due to both slits being open, the pulse has the opportunity to 'explore' the other pathways, and register on the screen. The way this occurs is that: when both slits are open and we send pulses hν, these pulses create a pattern of pathways in the

photon particle field. Note that the initially passive photons already exists in the area, as space is dense with them. *The generated pulses then follow the pathways which are more 'activated' by the pulses which are continuously being sent*, and the pulses also travel along the pathways then created. As an analogy, if you had two rubber bands which were held taut, how would you make the two vibrate, using only one band. If you criss-crossed them and vibrated one of them, its motion would make the other one vibrate too.

In conclusion, for the 'wave-pattern' to manifest, there is some recursion. When two slits are open, there is an interference among the photons 'downstream', near the target screen, and more of the pulses which are sent, are likely to follow the divergent pathways and hit the target screen, giving rise to the wavelike pattern. However, when one screen is blocked or closed, or a detector is placed, this interference pattern is destroyed because the interference pattern's activational influence affect is dampened. Due to this reason, the wavelike pattern on the registering target screen is also destroyed. Any devices placed either at the slits or other screens (intermediate screens) placed between the first screen (with the slits) and the target screen, will re-activate the interference pattern based on the nature of the intermediate screen.

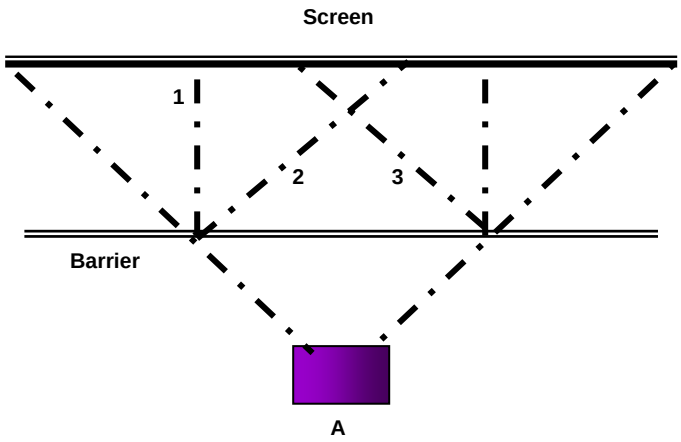

Fig. 5

In other words, detectors and other screens simply act as either dampeners or activators of the activity generated by the interference of the various photon pathways. Figure 5 pictorially explains this. Here, we see that photon pathway 2 and 3 interact and therefore become more activated. This increases the likelihood of more of the pulses, *hv,* being sent from the source following these pathways, in addition to pathway 1.

Standing waves are similarly produced by the cancellation of vibratory photons. We surmise that these standing waves are produced when the photons oscillate back and forth between two ends, where, when the oscillatory photons collide, as depicted by the short vertical line in Figure 6, there is cancellation, denoted by N. Everything in between the N's is reinforcement, denoted by A. The two-way arrow denotes the motion of the photon particles aligned in a chain-like fashion. (Note that the diagram is not drawn to scale, in terms of the size of the photons, relative to the length of their range).

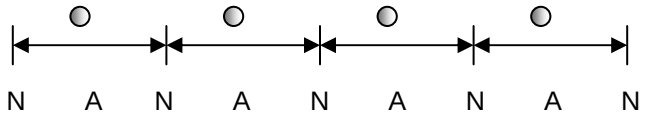

Fig. 6

Indeed, evidence that light cannot be photons travelling huge distances is provided by the standing wave phenomenon which Herbert E. Ives, foremost physicist at Bell Laboratories and one of the pioneers in the development of television, and others before him, investigated thoroughly. As Ives states:

> The phenomenon of the interference of light waves, elucidated by Young and Fresnel, familiarized the scientific world with the fact that two beams of light, in constant phase relation, could be superposed to produce regions of darkness. The most extreme case of this is offered by the superposition of two beams proceeding in the same straight line but in opposite directions. According to wave theory whether the waves are tensional waves along a string, or waves of sound in air, or waves of light, the region above a reflecting surface should exhibit layers in continuous agitation, between which are regions of no activity. Such systems are called standing waves.[39]

[39] Ives, Herbert E., (1979), *The Einstein Myth and the Ives Papers: A Counter-Revolution in Physics*, Rumford Medal Lecture 1951, "Adventures with Standing Light Waves", pp. 217 – 218.

Experiments on Standing Waves

Ives went on to discuss the experiment of Otto Wiener in 1890 in which a beam of light directed perpendicularly at a mirror would produce standing waves with areas of no activity (antinodes) and high activity (nodes) as recorded by a very thin photographic film, placed at an angle to the beam.[40] The experimental set-up was basically as follows:

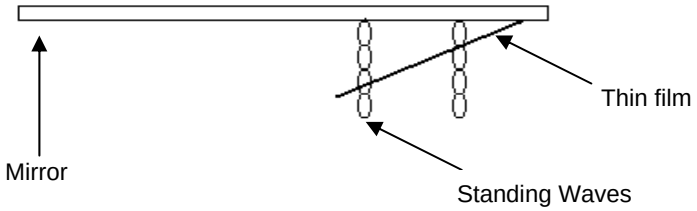

Fig. 7

After performing a repetition of Weiner's experiment, Ives concludes that:

> Refuge has been taken from this unsatisfactory state of affairs by using wave descriptions for some phenomena and photon descriptions for others, and it has been claimed that the two types of phenomena are never met in the same experiment. I submit that the last experiment described, the repetition of Wiener's experiment, certainly comes very close to showing both types of phenomena in conjunction.[41]

[40] Ibid., pp. 195 - 196
[41] Ibid., pp. 217 – 218

With this view we realise that in the Compton Effect[42] it only appears as if a photon has traversed from A (source) to B (destination) but in reality it has not. In summary, we state that light comprises of the pulse with packeted energy *hv* that travels through a sea of photons agitating them into oscillation (photon-photon interaction), in such a way that the pulse is carried along a straight path from source to destination.

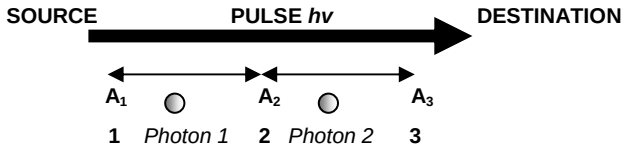

Fig. 8

In Figure 8, the two-way arrows depict the limit and range of the individual photon (here depicted as Photon 1 and Photon 2). The energy (motion) is carried from 1 to 2, and then to 3 at energy *hv*. A_1 to A_2 and A_2 to A_3 represent the range of each photon's reach, that is, the range of Photon 1 is from A_1 to A_2 and the range of Photon 2 is from A_2 to A_3. The pulse traverses from one photon to the next at points 2, by contact of the smaller particles surrounding each photon. In M. Muslim's model (discussed in Chapter 1), the photon would oscillatingly stretch from A_1 to A_2, another one from A_2 to A_3. In my model, the photon travels from A_1 to A_2, shown by the two-way arrow in Figure 8. However, M. Muslim, who proposed this basic idea regarding photons, and I are in agreement of the primary concept of activation and

[42] Sachs, Mendel, (1988) *Einstein versus Bohr: The continuing controversies in physics*, p. 226.

transmission. Other particles moving 'out of the way' of the photons produce the 'transverse effect' associated with light.

'Wavelike' Behaviour of more massive particles: The example of Electrons and C_{60} Fullerene molecules

In our model, what we are postulating is that the passive photons are perturbed by pulses created by the subatomic disturbances *in* the source, not by the emission of photons that are getting knocked off by electrons due to the 'heated' condition of a metallic substance at the source, to speak generally, and then traversing long distances. But the question remains: Why do we get the wave patterns that have been discussed above also, when we generate 'electrons' from the source as well? The explanation for this is not too surprising, once we consider that it was Louis de Broglie who turned the tables upside-down in the 1920's by postulating the electron's wave properties, to explain specific phenomena, at a time when the reverse happened with respect to light – it was being treated as a packet, that is, a photon instead of a wave, at the suggestion of Einstein. De Broglie would share our view in this book on the nature of microphysics, for he stated that:

> … statistical theories hide a completely determined and ascertainable reality behind variables which elude our experimental techniques.

Our explanation is that the electrons essentially follow the path of least resistance, and that is the path where the photons, which are already pre-existing in space, are also perturbed and create photon pathways (i.e. active paths by vibration); the electrons concomitantly simply traverse those paths. This is why one gets similar patterns with electrons, as one does with photons.

In fact, recently, it has been shown that even large molecules such as fullerenes exhibit wavelike behaviour. How are we to explain this? In the experiment with C_{60} fullerenes[43], the experimental set-up was that these fullerenes are shot through two openings and a final third grating. The recording of the fullerenes on the other end shows classical interference. In this case, what we believe that is happening is the same as that which is occurring with respect to the formation of the interference of the electrons. Again, the underlying photon particles are perturbed, creating an interference pattern and essentially pathways, as described in the section on the double- slit experiment. The fullerenes follow those pathways, like a road, which are more active than others. The ones that are active are the ones with intersecting pathways. This is the reason you get interference. The difference between the photon patterns and those interference patterns of the electrons and large atoms is that the interference patterns generated by photons are due to the pulses that are created *in* the photon field itself, whereas when atoms and molecules exhibit such behaviour, they are actually transversing the underlying perturbed photon field, which influences their motion, to created wavelike patterns at the recording end of the apparatus. In the microbit model when light pulses or electrons pass through a narrow aperture or slit, those that are close to the edge of the slit are diffracted. Note that diffraction helps explain the formation of the lines of path and their intersection downstream of the source, by criss-crossing with each other, which is a necessity in our microbit model. By diffraction what is meant is that light 'bends' as the passes through such small openings, governed by $\theta = \lambda/D$, where θ is the diffraction angle, λ the wavelength of radiant energy, and D the aperture diameter.

[43] Arndt, Marcus, *et al*, (1999) "Wave-particle duality of C_{60} molecules", *Nature*, pp. 680-682

Microbits as a New Model for Physics

Microbit Theory and David Bohm's Quantum Potential Model

In David Bohm's Model, which is essentially a resuscitation, expansion and development of Louis de Broglie's earlier idea, the electron is guided by a pilot wave that splits up when interfering with an apparatus and informs the electron of the surroundings which in turn causes the electron to move based on such global information about the experimental surroundings or set-up. Bohm's model, though deterministic like the microbit model, needs superluminal or non-local interaction. As John Briggs and David Peat explain:

> The pilot-wave theory has been applied to the double-slit experiment. Here the quantum potential causes particle tracks to bunch together as they pass through the slits, accounting for the familiar interference fringes. The guide wave acts nonlocally to organize the arrangement of every particle.[44]

The microbit model, in contrast, needs no superluminal action, or far-fetched pilot wave information gathering. With microbits, the surrounding pathways *are* the entrenched guides and informers of the pulses being generated by the source of deterministic solutions. However, despite the contrived nature of the pilot wave model, the positive aspect that Bohm has played in the formation of his theory is that he has brought about a discussion of the possibility of deterministic solutions to quantum mechanical enigma. Bohm has astutely and eloquently attacked the

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[44] Briggs, John, and. Peat, F. David, (1984), *Looking Glass Universe: The Emerging Science of Wholeness*, p. 140.

closed-mindedness and dogmatic thinking of many physicists in their clinging onto indeterminism, intransigently.

Explaining EPR and Bell's Theorem

When Einstein was engaged in his famous debate with Bohr on the nature of quantum mechanics, he devised a thought experiment in which he sought to outdo Bohr with respect to showing the fallaciousness of Bohr's interderministic views of quantum mechanics. According to Heisenberg's uncertainty principle, if one could determine the position of an electron, then in doing so, having disturbed it, one would not be able to measure its momentum or spin. What Einstein, Rosen and Podolsky suggested was that if a pair of particles A and B started out together, they would necessarily have opposite spins and if we then separated them by a large distance, if, for example, I knew the spin of particle A then I would know the spin of particle B without measuring its spin, because it would be the opposite of that of particle A, and if I knew the spin of the B without measuring it, then I could measure its position and know both position and momentum, without disturbing B, thereby disproving indeterministic notions of physics and showing that things are indeed wholly deterministic. What was found by conducting experiments (as that of Alain Aspect) and using Bell's theorem to judge the outcome of the experiment, is that when we measure the polarization of one of the photons (analogous to measuring spin) that was part of a pair that was initially together, it appears to instantaneously affect the polarization of the other.[45] The indeterministically bound physicists

[45]Penrose, Roger, (1989), *The Emperor's New Mind: Concerning Computers, Mind's, and The Laws of Physics*, pp. 279 – 287.
Penrose, Roger, (1995), *Shadows of the Mind*, pp. 246 – 249.

and philosophers believe that this result implies instantaneous action at a distance. Because faster than light travel is not allowed, according to Special Relativity, the situation is considered paradoxical and it is being assumed with this type of relativity, that the quantum world can exhibit non-local behaviour, that is, the instantaneous connectivity between things separated from each other.

Since microbit theory, however, allows for faster than light travel, if:

1. the results of all these experiments are accurate, and
2. there are no flaws in the measurement.
3. there are no flaws in the interpretations from these experiments

and all this is still under some debate, with the issue of the two loopholes, then one can actually easily envision a transmission being faster than the speed of light, though not instantaneous, according to the microbit model.

What are the two loopholes? Some researchers claim that there are other subtle points that need to be considered with regards to Bell's Theorem, in that there are loopholes. Specifically, there are two loopholes: First, there is the locality loophole, that refers to the two objects under investigation being so far spatially separated that no communication is possible at *c*, the speed of light in vacuum. In other words, they must be in different 'light cones'. The second loophole is the detection-efficiency one, in which only a small fraction of the 'particles' are detected. No experiment thus

far has been done that closes both loopholes in a single experiment.[46]

According the microbit model, it must be remembered that the photon is activational and two motions that originate from one common point but are sent in opposite directions or contain opposite complementary characteristics affect the whole network of photons that form both a field and pathway, where only the pulse travels, not the photon. Furthermore, it is to be remembered that according to quantum mechanics, most contemporary physicists are erroneously supposing that the electron, for example, does not have a definite spin at any given time which can be measured with respect to various directions. The microbit model presupposes such inherent determinacy. The indeterminant position of Bohr and his present day followers does not make any sense, and one does not need experiments to show the fallacious nature of such thinking. What needs to be done to show this by experimentation, however, is to overcome the two loopholes mentioned and also realize that quantum mechanics is probabilistic. Anything short of this is premature and misguided. Note the interesting contradiction of trying to disprove EPR, which postulates actual position/momentum, and yet interpreting the outcomes of experiments using the notion of the non-existence of definite positions and momentums and concomitantly also spin, which is what the experiments were set to determine in the first place. When this is realized, it will no doubt be confirmed by experiments too that the notion of non-locality (instantaneous action at a distance) for particle based structures will be dispelled and will never return to the domain of physics!

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[46] Grangier, Philippe, (2001), "Quantum physics: Count them all", *Nature*, pp. 774 – 775. Also: Rowe, M.A.; Kielpinski, D.; Meyer, V.; Sackett; C.A.; Itano, W.M.; Monroe, C. and Wineland, D.J., (2001), "Experimental violation of a Bell's inequality with efficient detection", *Nature*, pp. 79 – 794.

Summation: Pulses, Pathways, Photons and Recursion

In an explanation of the standing waves and the double-slit experiment, we have the following basic motions taking place: From this model of photon activity, what we see is that the 'pulse' causes a pattern in absolute space configuring the surrounding photons (just as if a pebble was dropped into a pond). The patterns generated are, in effect, pathways through which the pulse then travels. In other words, we have the following recursive situation: Pulse from source creates activation in the photon field and the creation of pathways which, in turn, affects the motion of the pulse and of other subsequent pulses being sent and so on. It only *appears* to us, with our measuring instruments, however, that it is a single photon travelling from source to destination. We must also note that the apparatus itself (i.e. slits) will be contributing to the overall pattern of photon field arrangement, through which the pulse transfer occurs.

Greater than *c*?

At the University of Berkeley, Professor Raymond Chiao's group has been conducting various experiments with photons. His and other groups have now confirmed that light can indeed travel faster than *c* when it passes through a specially constructed dielectric barrier. However, since this contradicts Special Relativity, the very group that has discovered them has downplayed these remarkable results. As Raymond Chiao states:

> We have thus confirmed that the peak of the tunneling wave packet may indeed appear on the far side of the barrier sooner than if it had been travelling at the vacuum

> speed of light. [And here comes the apologetic special relativity saving statement:] No signal can be sent with these smooth wavepackets …[47]

According to the microbit based explanation, however, it is not the photons that traverse the barrier, but rather, the pulse speed increases *in* the barrier, since the particles in the barrier oscillate faster due to the pulse transferred from the photons immediately adjacent to, and outside the barrier. Therefore it only illusorily appears as if a photon entering the barrier, speeds up through the barrier, and re-appears on the other side of the barrier. We state, however, that it is the pulse of particles *in* the barrier that increases in speed/frequency. The net result however is that superluminal velocity of the pulse has been achieved, and that in the future, such superluminal discoveries with photons or other particles will be used in information systems as technology advances, thereby even destroying the excuse of such photon behaviour as being uncontrollable or indeterminate, in order to circumvent violating the sacred cow of Einsteinian Relativity.

The second area of intensive research is photon-photon reactions, where Raymond Chiao's group is investigating photon-photon reactions in specialized settings, trying to ascertain if light can indeed behave as a superfluid.[48] However, the microbit model of the photon exhibits photon-photon interactions as the very basis of light's/radiations behaviour and that other photon-photon interactions are only a natural consequence of such a view.

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[47] Chiao, Raymond Y.; Kwiat, Paul G.; and Steinberg, Aephram M., (1994),"Quantum Nonlocality in Two-Photon Experiments at Berkeley", p.14. (Preprint quant-ph/9501016).
(http://physics.berkeley.edu/research/chiao/welcome.html

[48] Chiao, Raymond Y., (1999),"Bougoliubov dispersion relation for a "photon fluid": Is this a superfluid?" (Preprint quant-ph/9908060)
http://physics.berkeley.edu/research/chiao/welcome.html

The most 'dramatic' results on experiments investigating the potentiality of exceeding the constant "c" is the experiment of L.J. Wang, A. Kuzmich and A. Dogariu, of the NEC Research Institute, as reported in the scientific journal *Nature*. In their experiment, using "gain-assisted linear anomalous dispersion to demonstrate superluminal light propagation in atomic caesium gas"[49], they have shown that:

> Remarkably, the signal velocity of a light pulse, defined as the velocity at which the half point of the pulse front travels, also exceeds the speed of light in vacuum, *c*, in the present experiment.[50]

The experimenters also discuss that another part of the pulse moves at speed greater than *c*, specifically "…the 'frontal velocity' of a step-function signal…". The main point is that there is some part of the pulse, some thing, in other words, that exceeds *c*, and has the potential to carry information or be used in information processing, violating Special Relativity. [51]

Emission Theories

According to relativity theory, not only can no object travel faster than light, but the speed of the source has no effect on the speed of light as well. With the microbit model we have seen how this is possible, but our model is a physical one that explains the causative reason for this. Let us, however, examine the possibility of speed

[49] Wang, L.J., Kuzmich, A. and Dogariu, A., (2000), "Gain-assisted superluminal light propagation", *Nature*, pp. 277.
[50] Ibid., p. 279.
[51] Ibid., p. 279.

being dependent on the source's speed, even though microbit theory shows this not to be the case for the sake of looking into all the major phenomena associated with this fundamental issue. In this section we will be examining if there is any evidence against emission theory – if there is not, then relativistic notions which do not treat light as a special substance need to be looked into more seriously. J.G. Fox in an extensive review on experiments set out to disprove emission theory and states in his introduction that:

> There have been a number of experiments published recently which were designed to verify the constancy of the velocity of light when there is relative motion of the source and observer. These experiments bear directly on the question of excluding from serious physics emission theories of electromagnetism, such as that of Ritz, in favour of present day electromagnetism.
>
> Our general conclusion is that there is still a good case against emission theories but that the evidence is different from and less than it has been thought to be.[52]

Extinction theorem proposes that light passing through transparent medium is absorbed by the particles of that medium and re-emitted by them. The velocity of the source of the emergent light comprises that of particles of the original source. It has also been suspected that gaseous nebulae that do not share their orbital motion might envelop the components of the double star.

In the paper entitled "Test of the Second Postulate of Special Relativity in GeV the Region", the CERN physicists state at the outset that:

[52]Fox, J.G., (1965), "Evidence Against Emission Theories", *American Journal of Physics*, p. 1.

> The second postulate of special relativity states that the velocity of electromagnetic radiation is independent of the motion of the source. In spite of recent experiments to test this postulate…the empirical evidences remain either of low accuracy or subject to theoretical doubts …

The basic equations dealing with this issue are of the form:

$$c' = c + kv$$

where v is the velocity of the source that is in motion and k is a constant that is to be ascertained experimentally. Special Relativity requires that $k = 0$. When this CERN paper was written, the estimate for light emanating from close binary stars was $k < 10^{-6}$. Using the CERN Proton Synchrotron (PS) the velocity of γ rays was sought and determined to be $k = (-3 \pm 13) \times 10^{-5}$.[53] Thus, although k is small it is not zero.

It should be noted that Ritz's theory utilized Galilean Mechanics in which "… every electric charge continually emitted in all directions "fictitious" particles which were infinitely small … [which] leave the charge with the relative velocity c."[54] Historian of Science and Physics at Imperial College, University of London, Professor Herbert Dingle states that "an obvious objection to 'the extinction theorem', which no one appears to have taken into consideration at all, is that if the source of the light emerging from a transparent medium is the atoms or molecules of that medium, it should show their spectrum, but it does not. When light emanates from a mercury lamp, the light of the glass molecules is seen: if, then, the velocity of the 'source' of the observed light is that of the

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[53] Alvager, T., Farley, F.J.M., Kjellman J.and Wallin, I., (1964), "Test of the Second Postulate of Special Relativity in the GeV Region", *Physics Letters*, pp. 262.

[54] Ibid., Fox, p. 2

glass particles, why is the wave-length of the light that of some quite different 'source'?"[55] Dingle therefore does not assign much weight to this theory. However, this being said, the theory is not conclusively disproven and its normal cause and effect interpretation based on Galilean Relativity may yet turn out to be true. **(**Note that according to Special Relativity, we are faced with the illogical idea that no matter what frame of reference you are in, light always travels a *c*, even if you were traveling at .99*c* you would still see light travelling at *c*. We shall examine the historical reasons why this view was adopted in the following sections).

Some Historical Considerations: Epistemological Confusion

Herbert Dingle categorized epistemological confusion associated with the formulation/interpretation of special relativity into four categories. There were the errors in:

1. The relationship between mathematics and physics.
2. The erroneous substitution of observers for co-ordinate systems.
3. Literal interpretation of metaphors.
4. Circular reasoning.
5. The multiplicity of the meanings associated with the word "time".

In this section we shall examine the first four points. In the next section, we shall discuss in great depth, the fifth point which really encapsulates the first four. Let us now examine these issues in some detail:

[55] Dingle, Herbert, (1970), *Science at the Crossroads*, p. 209 – 210.

On the relationship between mathematics and physics:

Dingle states that both "…Galileo and Newton took *experiments* or *observations* as their starting point, and used mathematics only as a tool to extract the maximum amount of knowledge from the experiments and as a means of expressing that knowledge."[56] He goes on to state that: "…Maxwell showed that Ampère's law in electromagnetism, expressed mathematically – which of course I have said, was a mathematical expression of results found by experiment – did not satisfy the equation of continuity but could be made to do so by a purely mathematical modification. Accordingly he assumed that this modified form was the actual physical law."[57]

Dingle points out that, originally, Maxwell's equations were formulated to explain observational phenomena. However, ironically, mathematics became the master of physics with the emergence of these equations. No longer was mathematics serving as a language to describe observations – the equations started to take on their own reality. Instead of 'time' being interpreted as durations and instants (i.e. a measurement of changes), it became confused in many a discussion or paper with 'eternity', hence it became a malleable object, subject to contraction, dilation etc.

On the erroneous substitution of observers for co-ordinate systems

In the literature of relativity, there is almost invariably a great deal about `the observer', and statements about what different observers, in different states of motion, will observe. Dingle goes on to explain that "in special relativity theory, the observers whom it is considered worth while to compare are those whose relative motion is very great indeed – far greater than anyone has yet

[56] Ibid., p. 129
[57] Ibid., p. 130

managed to make possible" and that it should therefore be left out of an explication of the theory altogether.[58]

On the literal interpretation of metaphors.

Dingle rightly states that when we measure the mass of an electron it appears to be taken in the minds of people to mean the same as a mass of lead, for example. When we are talking of lead we put it on he weighing scale, but not so with an electron. He concludes that physicists have forgotten that the metaphorical nature of description and have drawn a false picture from the use of language on this subject.[59]

On Circular Reasoning

The other problem that lurks behind many a formulation in present day physics is circular reasoning. This is what Dingle had to say about the tests for relativity and of the fallacy of circular reasoning:

> We shall see that this is precisely the case with this (and indeed every other) supposed confirmation of relativity involving hypothetical particles. Einstein, as he said (see pp. 159-60), designed his theory to conform to the Maxwell-Lorentz electromagnetic theory which he accepted as equivalent to 'certain'.[60] All that the supposed confirmations support is therefore the fact that special relativity was well designed for its purpose. They tell us nothing whatever about the truth of either electromagnetic theory or special relativity (or Lorentz's) theory itself. An example of the illusion that they do that we have already met is advanced by Sir Lawrence Bragg concerning cosmic

[58] Ibid., p. 138
[59] Ibid., pp. 140 – 145.
[60] Ibid., p. 142.

rays (p. 111) and expressed in the usual jargon in the editorial in *Nature* (see Appendix) in the words, 'short-lived mesons in the cosmic rays appear to observers on the surface of the Earth to last long enough to reach the ground.' It needs not saying that the duration and distance of their fall are not measured by a stop watch and measuring tape but are first inferred from a course of reasoning that includes the original Maxwell-Lorentz theory, and is then 'corrected' by the special relativity theory designed for the purpose of correcting it. Is it surprising that the answer comes out right?

It is impossible to believe that men with the intelligence to achieve the near miracles of modern technology could be so stupid as to fall into this elementary error had they not, through long familiarity with the words, unconsciously come to believe that mass, time, distance, and such terms mean the same for hypothetical particles as for the world of senses. Physicists have forgotten that their world is metaphorical, and interpret the language literally. I do not think Einstein would for one moment have regarded these cosmic ray observations as *evidence* for his theory, but only as an *application* of it. His theory in itself was wholly kinematical: it corrects electromagnetic theory because it created a new kind of kinematics for that end; it can therefore be *tested* only by straightforward kinematics with sensible bodies, and by reasoning in which the words used have their literal, and not their metaphorical meanings.[61]

Similarly Fox states that:

[61] Ibid., p. 143

> The time dilation in the lifetimes of high speed π mesons and μ mesons[62] has not been measured as precisely as other relativistic effects. However, in the experiment of Frisch and Smith, the measured dilation factor of 8.8 ± 0.8 was decisively in agreement with special relativity and in contradiction with Ritz theory which used classical notions of space and time.[63]
>
> The situation here is not quite as clean as one would like. There is some circularity in the argument when these experiments are invoked to disprove Ritz. For example, in the pion experiment[64], a large correction had to be made to allow for those decay muons which continued in the direction of the parent pions and thus gave unwanted counts. [And here comes the circularity:] Lorentz invariant kinematics for the decay muon and neutrino were of course utilized in calculating this correction. …[65]

Let us however grant that according to particle accelerator experiments, it is true that the lifetime of fast moving muons is 30 times that of muons at rest.[66] This does not mean that there is actual time dilation. All it may mean is that the physical stability of the object changes when it moves close to light speed so as create a situation where the rates of interaction impinging on the object change. A qualitative explanation based on cause and effect

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[62]Ibid. p. 13, footnote citation: D.H. Frisch and J.H. Smith, (1963), *Am. J. Phys.*, 31, 342 and R .P. Durbin, H.H. Loar, and W.W. Havens, Jr., (1952), *Phys. Rev.*, 88, 179.

[63] Fox, J.G., *American Journal of Physics*, "Evidence Against Emission Theories", p. 13.

[64] Ibid., p. 13, footnote citation: D.H. Frisch and J.H. Smith, (1963), *Am. J. Phys.*, 31, 342 and R .P. Durbin,

[65] Ibid., p. 13

[66] Harald, Fritzsch, (1994), *An Equation that Changed the World: Newton, Einstein and the Theory of Relativity*, p. 132.

relations had also been suggested by Ritz and others that involved an interaction between the objects being measured and their surroundings, or the subtle variational effects that would impinge on the object the way they would be oriented in space, while passing through other fields.[67]

Now that the cracks in Special and General Relativity are becoming clear various models have been proposed to explain the universe, but what they lack is an integrating and unifying feature. If for example, it is claimed that there is a 'dynamic aether' that surrounds and moves with the particles then the question remains: Is the aether itself made of particles or not? Indeed, such an aether does eliminate the 'action at a distance' problem in a more concrete way, but it does not answer the question of what it is itself composed of. In this vein, microbits act as a bridge between no-aether and aether. Since everything is made of microbits and there are a lot of them, the interactions that occur among microbit composed structures at various sub-atomic levels eliminates action at a distance, without resorting to the illogical notion of virtual particles, because there is actual contact being made at the level of the smallest particle, which is the microbit. A field comprises of microbitic particles that are not just bumping into each other aimlessly, but creating differentials and gradients (e.g. gravitation) or their pressure forces.

How exactly did we end up in this relativistic conundrum?

Einstein tried to reconcile Maxwell's equations to satisfy the two postulates of relativity[68] including the constancy of light. Einstein's

[67] Fox, p. 14.
[68] The two postulates of Special Relativity are:

ultimate aim was to reconcile kinematics with electromagnetism, and his method of approach differed from that chosen almost automatically by others in that it proposed a modification of kinematics rather than of electromagnetism for this end. Dingle elaborates that electromagnetic experiments to test special relativity cannot work because the theory has to be tested on kinematics upon which it is based.

> All that its success in electromagnetism, however extensive and various, can show that, *if* the proposed kinematics is tenable, then it has achieved its object; it can do nothing at all to show whether the theory is right or wrong.[69]

As the renowned physicist, David Bohm explains, with regards to electromagnetism, which inspired Einstein towards his Special Theory of Relativity:

> In one case the magnet is considered to move past the conductor, a loop of wire is connected to an electrical meter. Through the electrical field associated with the moving magnet, a current is induced in the wire – the net result is a deflection of the meter. In the second explanation, the electrical conductor is moved past the magnet, which is now at rest. No electrical field is produced in this case; rather the magnetic force on the charged particles (electrons) in the wire cause a current to flow and a deflection of the meter. Two quite different and

1. The laws of physics are the same in all inertial systems. No preferred inertial system exists (the principle of relativity).
2. The speed of light in free space has the same value c in all inertial systems (the principle of the constancy of the speed of light).

[69] Ibid., Dingle, p. 149.

> apparently incompatible explanations are therefore produced for one and the same phenomenon: the flow of an electrical current when a magnet and a wire move relative to each other.[70]

For this, Einstein introduced the Lorentz contraction. David Bohm goes on to state that:

> Through his [Einstein's] perception that relative motion was the essential point, Einstein was led to see electrical and magnetic effects not as absolute and independent but rather as relative to the state of motion. ...To achieve the new unity between electricity and magnetism, Einstein had to suppose that time, measured in the frame that moves relative to the laboratory (say, the magnet), is different from time measured in the stationary laboratory frame (say the fixed wire).[71]

Philosopher Paul Thagard also elaborates on this:

> [Einstein's] initial paper, "On the Electrodynamics of Moving Bodies," begins by discussing the asymmetries in the applications of Maxwell's equations to the reciprocal action of a magnet and a conductor. [According to the equations if] the magnet is in motion and the conductor is at rest, then an electric field arises, but not if the magnet is at rest and the conductor is in motion.[72]

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[70] Bohm, David and Peat, F. David, (1987), *Science, Order, and Creativity*, p. 74

[71] Ibid., Dingle, p. 137.

[72] Thagard, Paul, (1992),*Conceptual Revolutions*, p. 207

In that paper, Einstein wrote that "…the same laws of electrodynamics and optics will be valid for all frames of reference for which the equations of mechanics hold good."[73] He then postulated the Principle of Relativity. This refers to the exact correspondence between the compared expressions of physical laws between a stationary scientist and a moving one, each observing each others experiments from their own frames of reference.

One of the basic problems with this view is that we are coming to realize that: Everything is motion – even the laws we are finding out more about are based on particles (e.g. the electro-weak force). Therefore, it must be realized that any law in the universe is based on a human encapsulation into mathematical symbolic language of the relationships of the interactions (motions) taking place whose registered speed of interaction is dependent on the observer. If a 'law' involves the exchange or speed of particles travelling from point A to point B at the speed of light 'c' then if we are also, for the sake of argument, travelling at 'c', light would appear stationary. There is no violation of any laws as such and there was no need to reform kinematics[74] – a choice taken by

[73] Einstein A., (1952), *The Principle of Relativity*, New York, Dover, p. 37f.

[74] In order to combine mechanics and electrodynamics within an all-embrasing principle of Galilean Relativity, three main choices were available.

1. Alter Maxwell's equations in such a way as to make them covariant under Galilean transformations.
2. Introduce new transformations rather than the Galilean ones whilst leaving Maxwell's equations unchanged yet achieving the required covariance under transformation.
3. Replace the existing Maxwell's equations by a new set of equations.

History will no doubt show that the obviously convoluted 'solution' that was employed, that is, choice number 2, will rank as one of the greatest conceptual blunders in the history of science.

Einstein to preserve Galilean Relativity. The very fact that our knowledge that we are travelling at 'c' as well would enable us to realize that the particles we were observing were also travelling at 'c'. There was and is nothing sacred about Galilean Relativity that must be preserved in the case of electromagnetism by altering perceptions of reality – of space and 'time' – the way Einstein did, especially if other choices were available for preserving Galilean Relativity in *absolute space*.

Einstein's thinking that was, in effect, backwards, and far from being a 'genius', he was, in reality, a genius for attempting to change reality rather than for understanding things as they are, and then describing them and offering a solution. The German philosopher Kant was shrewd enough to observe this tendency in human beings when he stated that:

> It seems surprising at first, but is non the less certain, that our reason does not draw its conclusions from Nature, but [erroneously] prescribes them to it.

One's model has to conform to reality; it is not reality that has to conform to the model. While there has been a degenerating drift away from making models fit reality, it is part and parcel of a wayward trend where:

> In modern physics, mechanical visualization in images has been supplanted by a new higher type of visualization, if one may put it so – logical "visualisation" of abstract mathematical schemata of phenomena.[75]

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[75] Rodichev, V.I., (1983), "Methodological Aspects of Unified Field Theory", *Einstein and the Philosophical Problems of 20th Century Physics*, p. 346.

Such visualisations and mathematical or geometrical approaches may be fine, even though not the optimal approach, so long as we realize that they are merely operational procedures, and not a physical description of actual reality.

The Lorentz transformations were introduced in order to preserve Maxwell's equations that did not agree with Galilean Relativity. These ideas, emerging from special relativity, applied using the Lorentz transformation, were subsequently employed to formulate General Relativity by introducing the unity of space and 'time' within special relativity. Consequentially, instead of discovering a reality-based model, an abstract model was created by mathematical manipulation, which was generalized and has become a dogmatically entrenched view with logical inconsistencies. The chief architect of this further mixing of apples and oranges, although the oranges did not in reality even exist, was the mathematician Hermann Minkowski. Dingle elaborates that:

> Einstein's theory was designed to provide a relation that held for both kinds of events [both for electromagnetic and kinematic]. It was wholly physical, and concerned wholly with a problem of the traditional kind, involving only traditional concepts. [However, through] … Minkowski's metaphysical interpretation of his own mathematics, it came to be enveloped in a metaphysical cloak that had nothing whatever to do with its essence.[76]

At the beginning of this century, when Lorentz, Einstein and Minkowski were tackling these scientific issues 'relativity' theory was mistakenly ascribed to all these individuals as if they were referring to the same theory. However, Lorentz's theory demanded

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[76] Ibid., Dingle, pp. 137–138.

an aether, whereas Einstein's was not valid with one. Einstein and Lorentz were only concerned with 'instants' and 'duration' whereas Minkowski brought in `eternity'. Space and time were taken to be interchangeable, whereas in the original paper of Einstein, they were not described as thus. As people began to assume that such was the case, the theory began to be seen as something beyond normal comprehension. The mathematicians began to pronounce absurd theorems and the experimenters gave in due to "mental inertia" as Dingle put it. The other problem was the institutionalization of mathematized physics of relativity that the older generation before Dingle, which comprised of great and distinguished scientists, did not master, and as a result, did not challenge. The newer generation took over the error of the inordinately mathematized physics and was not even willing to consider Dingle's ideas challenging them (which eventually resulted in his writing the critical book entitled *Science at the Crossroads*). Likewise, the older generation was also wary of challenging the newer one, as Dingle found his utter dismay.

Further Historical Considerations for both Special and General Relativity

The following abridged article is a concise history of the development or development of Special Relativity and General Relativity by Physicist G. Burniston Brown. Due to the domination in academia with Einstein's theories and persona it did not receive attention that was due to it and we therefore including it in this book as being complementary to our discussion of this subject. The original article – whose excerpts we give below – was published by the *Bulletin* of The Institute of Physics and the

Physical Society[77], pp. 71-77, March 1967 and is entitled *What is wrong with relativity?* [Endnote 1]

> Genuine physicists – that is to say, physicists who make observations and experiments as well as theories – have always felt uneasy about 'relativity'. As Bridgman said, "if anything physical comes out of mathematics it must have been put in another form". The problem was, he said, to find out where the physics got into the theory (Bridgman 1927)[78]. This uneasiness was increased when it was clear that distinguished scientists like C. G. Darwin and Paul Langevin could be completely misled. Darwin wrote a fatherly letter to *Nature* (Darwin 1957) describing the simple way in which he explained 'relativity' to his friends: the simplicity, however, was due to the fact that, with the exception of a quoted formula, there was no relativity theory in it at all. Langevin, likewise, gave a supposedly 'relativistic' proof of the results of an optical experiment by Sagnac, but as his countryman André Metz said, although "assez élégant", it was not relativity (Metz 1952). There were other disturbing features: the fact that Einstein never wrote a definitive account of his theory; that his first derivation of the Lorentz transformation equations contained velocities of light of c-v, c+v and $(c^2-v^2)^{1/2}$, quite contrary to his second postulate that the velocity of light was independent of the motion of the source; and that his first attempt to prove the formula $E = m_0c^2$, suggested by

[77] The late G. Burniston Brown's article is printed here by the permission of the Institute, whose website is: www.iop.org.
[78] Refer to Appendix A for all references cited in G. Burniston Brown's article.

Poincaré, was fallacious because he assumed what he wanted to prove, as was shown by Ives (Ives 1952).[79]

It is not surprising, therefore, that genuine physicists were not impressed: they tended to agree with Rutherford. After Wilhelm Wien had tried to impress him with the splendours of relativity, without success, and exclaimed in despair "No Anglo-Saxon can understand relativity!", Rutherford guffawed and replied "No! they've got too much sense!"[Endnote 2] Let us see how sensible they were.

First of all, a little history. There is no need to repeat the accounts, now given in many textbooks, of the unsuccessful attempts to detect the aether. The simplest hypothesis, namely that the aether did not exist and that we were thus left with action-at-a-distance or ballistic transmission, was held to be unacceptable. Instead, Poincaré preferred to raise this failure to a 'principle' – the principle of relativity – saying: "The laws of physical phenomena must be the same for a 'fixed' observer as for an observer who has a uniform motion of translation relative to him, so that we have not, and cannot possibly have, any means of discerning whether we are, or are not, carried along by such a motion." As a result there would perhaps be "a whole new mechanics, where, the inertia increasing with the velocity, the velocity of light would

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[79] Essentially, what Ives conclusively shows in his paper, cited by G. Burniston Brown, entitled "Derivation of the Mass-Energy Relation", is that: "What Einstein did by setting down these equations (as "clear") was to introduce the relation:

$$L/(m\text{-}m')\,c^2=1$$

Now this is the very relation the derivation [of Einstein] was supposed to yield. … [Therefore because of this fundamental error the] relation $E=mc^2$ was not [in reality] derived by Einstein."

become a limit that could not be exceeded" (Poincaré 1904).

In the next year, 1905, Einstein re-stated Poincaré's principle of relativity and added the postulate that the velocity of light is independent of the velocity of its source. From the principle and the postulate he derived the Lorentz transformation equations, but in an unsatisfactory way as we have seen. Another curious feature of this now famous paper (Einstein 1905) is the absence of any reference to Poincaré or anyone else: as Max Born says, "It gives you the impression of quite a new venture. But that is, of course, as I have tried to explain, not true" (Born 1956).

In 1906 Planck worked out the 'new mechanics' predicted by Poincaré, obtaining the well-known formula

$$F = \frac{d}{dt}\left\{\frac{mv}{(1 - v^2/c^2)^{1/2}}\right\}$$

and the corresponding expressions for momentum and energy. In the next year he derived and used the mass-energy relation (Planck 1906, 1907).

In 1909, G. N. Lewis drew attention to the formula for the kinetic energy

$$\frac{m_o c^2}{(1-v^2/c^2)^{1/2}} - m_o c^2$$

and suggested that the last term should be interpreted as the energy of the particle at rest (Lewis 1909). Thus gradually arose the formula $E = m_o c^2$, suggested without general proof by Poincaré in 1900.

It will be seen that, contrary to popular belief, Einstein played only a minor part in arriving at the main ideas and in the derivation of useful formulae in the restricted, or special, theory of relativity, and Whittaker called it the relativity theory of Poincaré and Lorentz, pointing out that it had its origin in the theory of aether and electrons (Whittaker 1953). A recent careful investigation by Keswani confirms this opinion; he summarizes Poincaré's contribution as follows:

"As far back as 1895, Poincaré, the innovator, had conjectured that it is impossible to detect absolute motion. In 1900 he introduced 'The principle of relative motion' which he later called by the equivalent terms 'The law of relativity' and 'The principle of relativity' in his book *Science and Hypothesis* published in 1902. He further asserted in this book that there is no absolute time and that we have no intuition of the 'simultaneity' of two 'events' [mark the words] occurring at two different places. In a lecture given in 1904, Poincaré reiterated the principle of relativity, described the method of synchronization of clocks with light signals, urged a more satisfactory theory of the electrodynamics of moving bodies based on Lorentz's ideas and predicted a new mechanics characterized by the rule that the velocity of light cannot be surpassed. This was followed in June 1905 by a mathematical paper entitled 'Sur la dynamique de l'électron', in which the connection between relativity (impossibility of detecting absolute motion) and the Lorentz transformation, given by Lorentz a year earlier, was recognized. [Endnote 3] In point of fact, therefore, Poincaré was not only the first to enunciate the principle, but he also discovered in Lorentz's work the necessary mathematical formulation of the principle. All

this happened before Einstein's paper appeared (Keswani 1965)."

Einstein's attempt to derive the Lorentz transformation equations from the principle of relativity and the postulate that the velocity of light is independent of that of the source would (if it had not involved a contradiction) have made Lorentz transformations independent of any particular assumption about the construction of matter (as it had not been in Lorentz's derivation). This feature, of course, was pleasing to the mathematically minded, and Pauli considered it an advance. Einstein said that the Lorentz transformations were "the real basis of the special relativity theory" (Einstein 1935), and this makes it clear that he had converted a theory which, in Lorentz's hands at any rate, was a physical theory (involving, for instance, contraction of matter when moving with respect to the aether) into something that is not a physical theory in the ordinary sense, but the physical interpretation of a set of algebraic transformations derived from a principle which turns out to be a rule about laws, together with a postulate which is, or could be, just the algebraic expression of a fact – the independence of the velocity of light of that of the source (experiments already done appear to confirm it but more direct evidence is needed). We see, then, that 'relativity' is not an ordinary physical theory: it is what Synge calls a "cuckoo process"; that is to say, Nature's laws must be found first, and then they can, perhaps, be adapted to comply with the overall 'principle'.

"The eggs are laid, not on the bare ground to be hatched in the clear light of Greek logic, but in the nest of another bird, where they are warmed by the body of a

foster mother, which, in the case of relativity, is Newton's physics of the 19th century" (Synge 1956).

The special theory of relativity is therefore founded on two postulates

(a) a law about laws (Poincaré's principle of relativity).
(b) an algebraic representation of what is, or could be, a fact (velocity of light constant, independent of the velocity of the source).

and its application to the physical universe is

(c) a cuckoo process.

…But in this process there can be no guarantee that contradictions will not arise, and, in fact, serious contradictions have arisen which have marred the special theory. Half a century of argumentation has not removed them, and the device of calling them only apparent contradictions (paradoxes) has not succeeded in preventing the special theory of relativity from becoming untenable as a physical theory. The most outstanding contradiction is what the relativists call the clock paradox. We have two clocks, A and B, exactly similar in every way, moving relatively to one another with uniform velocity along a line joining them. If their own interaction is ignored and they are far removed from other matter, they continue to move with uniform velocity, and so each clock can be considered as being the origin of a set of inertial axes. The Lorentz transformations show that the clock which is treated as moving goes slow. The principle of relativity, however, asserts that, as A and B both provide

inertial frames, they are equivalent for the description of Nature, and all mechanical phenomena take the same course of development in each. Referred to A, B goes slow; referred to B, A goes slow. It is not possible for each of two clocks to go slower than the other. …

A more intriguing instance of this so-called 'time dilation' is the well-known 'twin paradox', where one of two twins goes for a journey and returns to find himself younger than his brother who remained behind. This case allows more scope for muddled thinking because acceleration can be brought into the discussion. Einstein maintained the greater youthfulness of the travelling twin, and admitted that it contradicts the principle of relativity, saying that acceleration must be the cause (Einstein 1918). In this he has been followed by relativists in a long controversy in many journals, much of which ably sustains the character of earlier speculations which Born describes as "monstrous" (Born 1956).

Surely there are three conclusive reasons why acceleration can have nothing to do with the time dilation calculated:

(i) By taking a sufficiently long journey the effects of acceleration at the start, turn-round and end could be made negligible compared with the uniform velocity time dilation which is proportional to the duration of the journey.
(ii) If there is no uniform time dilation, and the effect, if any, is due to acceleration, then the use of a formula depending only on the steady velocity and its duration cannot be justified.

(iii) There is, in principle, no need for acceleration. Twin A can get his velocity V before synchronizing his clock with that of twin B as he passes. He need not turn round: he could be passed by C who has a velocity V in the opposite direction, and who adjusts his clock to that of A as he passes. When C later passes B they can compare clock readings. As far as the theoretical experiment is concerned, C's clock can be considered to be A's clock returning without acceleration since, by hypothesis, all the clocks have the same rate when at rest together and change with motion in the same way independently of direction. [Endnote 4] One more contradiction, this time in statics, may be mentioned: this is the lever with two equal arms at right angles and pivoted at the corner. It is kept in equilibrium by two equal forces producing equal and opposite couples. According to the Lorentz transformation equations referred to a system moving with respect to the lever system, the couples are no longer equal so the lever should be seen to rotate, which is, of course, absurd. Tolman tried to overcome this by saying that there was a flow of energy entering one lever arm and passing out through the pivot, just stopping the rotation! Overlooking the fact that energy is a metrical term and not anything physical (Brown 1965, 1966), there would presumably be some heating in the process which is not considered. Statics provides insuperable difficulties for the physical interpretation of Lorentz transformation equations and this part of mechanics is avoided in the textbooks – in fact, Einstein omits statics in his definition: "The purpose of mechanics is to describe how bodies change their position in space with time" (Einstein 1920, p. 9).

The three examples which have been dealt with above show clearly that the difficulties are not paradoxes (apparent contradictions) but genuine contradictions which follow inevitably from the principle of relativity and the physical interpretations of the Lorentz transformations. The special theory of relativity is therefore untenable as a physical theory.

Turning now to the general theory of relativity, Einstein tells us in his autobiography (Einstein 1959) how, at the age of 12, he began to doubt Bible stories. "The consequence was a positively fanatic (orgy of) free-thinking coupled with the impression that youth is intentionally being deceived by the State through lies; it was a crushing impression. Suspicion against every kind of authority grew out of this experience, a sceptical attitude towards the convictions which were alive in any specific social environment – an attitude which has never again left me."

This sceptical attitude towards prevailing convictions possibly explains why Einstein was not satisfied with the relativity theory of Poincaré and Lorentz which stopped short of including accelerating systems, thus still leaving something apparently 'absolute'. He still seemed to be affected by this word 'absolute', but it is difficult to see what it could mean except with regard either to the Sensorium of God (Newton) or an aether pervading all space. He pushed on, therefore, with an attempt to show that natural laws must be expressed by equations which are covariant under a group of continuous coordinate transformations. This group, which Einstein took as the algebraic expression of a general principle of relativity, included, as a subgroup, the Lorentz transformations

which Poincaré had taken as the algebraic expression of the restricted principle.

To overcome the physical difficulty that acceleration produces forces (inertial) whereas uniform velocity does not, Einstein was led to assert that these forces cannot be distinguished from ordinary gravitational force, and are therefore not an absolute test of acceleration. This contention Einstein called the principle of equivalence. In trying to support this contention, he imagined a large closed chest which was first at rest on the surface of a large body like the Earth, and then later removed to a great distance from other matter where it was pulled by a rope until its acceleration was g. No experiment made inside could, he claimed, detect the difference in the two cases. But in this he was mistaken, as I have shown (Brown 1960). In the first case, if two simple pendulums were suspended with their threads a foot apart, the threads would not be parallel but point towards the centre of mass of the Earth (or a point somewhat nearer allowing for their mutual attraction). The angle between them would, in principle, be detectable by the Mount Palomar telescope. When accelerated by a rope, the threads would be parallel if it were not for the small mutual attraction. If now, the threads were moved so as to be further apart, the angle between them would increase in the first case, but in the second case the threads would become more parallel so that the angle would therefore decrease. The principle of equivalence is therefore untenable. It is gratifying to find one theoretician who states that the principle is false (Synge 1960): "In Einstein's theory there is a gravitational field or there is none, according as the Riemann tensor does or does not vanish. This is an absolute property: it

has nothing to do with the observer's world-line." The principle of equivalence is made plausible by the use of the expression 'gravitational field', overlooking the fact that this is a useful conception but cannot be demonstrated. All we can do is place a test particle at the point in question and measure the force on it. This might be action-at-a-distance. As soon as the term 'field' is dropped and we talk about the gravitational force between bodies at rest, we realize that the force is centripetal, whereas the force of inertia is not. This is an important difference obscured by the use of the word 'field'. Relativists now admit that the principle of equivalence only holds at a point; but then, of course, we have left physics for geometry – experiments cannot be made at a point.

This contact with the physical world having gone, we are left in the general theory only with the principle of covariance – that the *laws* of physics must be expressed in a form independent of the coordinate system, and the mathematical development of this condition which Einstein did with Grassman and others. Unfortunately, given sufficient ingenuity, almost any law of physics can be expressed in covariant form, so that the principle imposes no necessary restriction on the nature of these laws. The principle is therefore barren, and Einstein had to regard it as merely of heuristic significance (by considering only the *simplest* laws in accord with it (Einstein 1959, p. 39)). Also the number of problems which can be completely formulated, let alone solved, is extremely small. Some relativists look on it rather as an encumbrance (Fock 1959). The three consequences stemming from Einstein's theory of gravitation, that are usually brought forward as supporting it, are also not impressive. The movement of

the perihelion of Mercury was known before and can be explained in various ways (Whittaker 1953). The 'bending of light' round the Sun had been suggested before, and the much advertised confirmation in the eclipse of 1919 involved assuming Einstein's law of 'bending' to obtain the 'scale constants', with the help of which the results were derived which were supposed to prove it. The deflections of stars that moved transversely or in the opposite direction to that predicted were omitted. The mean deviation and its direction varied from plate to plate during the eclipse, suggesting refraction in a turbulent diffuse 'atmosphere'. Nevertheless a mean value was obtained "in exact accord with the requirements of the Einstein theory" (*Lick Observatory Bulletin* 1922, No. 346). Later attempts have given different values. This must be one of the most extraordinary self-deceptions in the whole history of science (see Poor 1930). The gravitational red shift of light now appears to be confirmed, but this follows from Mach's hypothesis[Endnote 5] that inertial forces are due to interaction with the distant bodies of the Universe[Endnote 6] and does not require 'relativity' as the author has shown (Brown 1955).

We see, then, that the general theory is based physically on a fallacy (principle of equivalence) and on a principle that is barren (covariance) and which is also, mathematically, almost intractable. Genuine physicists may well agree with Fock that it is not a major contribution to physics.

The whole subject of 'relativity' is extremely interesting looked at from the point of view of scientific method. Western science long ago involved the rejection of the view that Nature's ways can be found by just taking

thought, or by the adoption of principles based on reason alone, or beauty, or simplicity. The idea of perfection in the heavens, as we know, held back astronomy with epicycles and caused sunspots to be explained away.

Newtonian method consists in first establishing the facts by careful observation and experiment, and then proceeding to attempt an explanation of them in physical terms – matter, motion and force – then from such a theory to derive, by logic and mathematics, various principles (e.g. conservation of momentum) as well as further consequences which can be put to experimental test. Natural science is concerned with causes: logic and mathematics are only tools. Newton made this clear when, after giving the first satisfactory explanation of the tides, he said: "Thus I have explained the causes of the motion of the . . . Sea. Now it is fit to subjoin something concerning the quantity of those motions." But relativists now assert that "The dignity of pure theoretical speculation has been rehabilitated . . . based on a process of the mind with its own justification" (shades of Descartes!). Relativity "has saved science from narrow experimentalism, it has emphasized the part which beauty and simplicity must play in the formulation of theories of the physical world" (Mercier 1955)…

Belief in principles because of their mathematical elegance, or cogency, leads also to a distortion of physics, its purpose and its history. Most of the discussion about observers and their imagined measurements is remote from anything that physicists do. Having to call force a fiction, which it cannot be by definition, since we have a special set of deep-seated nerves for detecting it, and asserting that it can be removed by a mere transformation

of axes illustrate distortions of physics which are common. Even distortion of mathematics occurs in Einstein's later attempt to derive the Lorentz transformation equations from the principle of relativity together with algebraic expression of the constancy of the velocity of light. In this proof he is forced, as Essen has pointed out (Essen 1962), to use the same symbol for two different quantities, and later he derives a dimensionally impossible equation by putting a length equal to unity (Einstein 1920). [Endnote 7] It is difficult not to repeat Keswani's comments on Einstein's first (1905) proof: "The steps taken have a curiously compensating effect and apparently the demonstration was driven towards the result" (Keswani 1965).

The distortion of the purpose of physics has already been exemplified by Einstein's definition of mechanics which leaves out statics. "The object of physics is to predict the results of given experiments concerning stated events", says McCrea (McCrea 1952), but the business of physicists is with "the causes of sensible effects", as Newton said – *causes*, not just rules and predictions. The distortions of the history of physics are too common to be worth detailed mention: many papers and broadcast lectures begin with a travesty of Newton's views….

What then remains of the theory? The Lorentz transformations have proved not to be the necessary formulation of the principle of relativity, as Poincaré believed, since physical interpretations of them have contradicted the principle. When applied, perspicaciously, to Newtonian physics they produce formulae which are certainly superior to the 'classical' ones at high speeds. But the Lorentz transformation equations were first derived and used by Voigt in 1887 in connection with elasticity,

and later, again, by Lorentz in connection with the electron theory of matter, and do not depend on 'relativity' for their derivation.[Endnote 8] The placing of the Lorentz term $(1-v^2/c^2)^{1/2}$ under *m*, the mass, following Poincaré's prediction of a velocity *c* that cannot be exceeded by matter, has been supported by experiments with accelerators (relative to the machine). Once again, however, interpretations of algebra are not a substitute for genuine physical theory: the interaction of a particle with distant matter (force of inertia), tending to infinity when *v* approaches *c*, is not the only physical interpretation; it may be that interaction with nearby matter (the accelerating force) may tend to zero when *v* approaches *c*. This hypothesis, for example, avoids the supposition of an enormous amount of matter in the Universe for which there is no evidence (Brown 1955, 1957, 1958, 1963). The general theory has been well summed up by Fock: "It is…incorrect to call Einstein's theory of gravitation a 'General theory of relativity' all the more since 'The general principle of relativity' is impossible under any physical condition."

"The general covariance of equations has quite a different meaning from the physical principle of relativity; it is merely a formal property of the equations which allows one to write them down without prejudging the question of what coordinate system to use. The solution of equations written in generally covariant form involves four arbitrary functions; but the indeterminacy arising from this has no fundamental importance and does not express any kind of 'general relativity'. From a practical point of view such an indeterminacy even represents something of a disadvantage" (Fock 1959).

Microbits as a New Model for Physics

Ives and the Technical Undoing of Einsteinian Relativity

In the 1930's and 40's Herbert Eugene Ives (d. 1953), one of the top physicists at Bell Laboratories, performed a series of experiments and published numerous theoretical papers based on experimentation results which modified the equations of relativity, basing them on Absolute Space and Time. Ives' now classical experimentation on atomic clocks showed that as an atomic clock speeds up its time-keeping mechanisms slow down. In other words, the results of motion have a real physical affect on the objects in motion. He also upheld the principle of relativity, as espoused by Poincaré, and the independence of the speed of light on the motion of the source. However, according to Einstein, as opposed to Ives, the speed of light remains the same no matter what frame of reference one is in. This has led to the fusion of space co-ordinates with time and all the attendant irrational and mystical notions of space and time that we have discussed above, including the inconsistency of Special Relativity. In Ives' most significant paper[80], which has to this date been ignored by the general scientific community, he shows that it is not the speed of light that is constant for moving reference frames but the *rod-clock quotient*.[81] What this means is that since we are limited and

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[80] Ives, Herbert E., (1951), "Revisions of the Lorentz Transformations", *Proceedings of the American Philosophical Society*, pp. 125–131.

[81] Ibid., p. 130. The *rod-clock quotient*, has a value c, in all frames (platforms). This is given by the equation:

$$c = \frac{(x'^2 + y'^2 + z'^2)^{1/2}}{t' + r'/q\left[(1+ q^2/c^2)^{1/2} - 1\right]}$$

measurement is based on limited speeds (for example the value *c*), our mathematical equations (models of reality) must include a reflection of these instrument measurements, taking the context into consideration. Everything in Ives' equations corresponds to measurable and observable parameters. In the case of 'relativity' it leads to one constant between frames of reference, but this is not "*c*" in terms of the speed of light being constant for all frames. Ives had, in other words modified Poincaré's modification of the Lorentz equations. In an almost equally important paper, Ives explains that the basic problem with the notion of the constancy of the speed of light irrespective of the frame of reference is that of the neglection of the fact that the speed *c*, can be ascertained using two types of measurements. The first type is the measurement based on light being sent *out and back*. The second is the *one-way* velocity. The only way to determine this velocity is to actually send a 'setting clock' from the clock at the origin to the distant clock at the other end:

> The resulting epoch will of necessity be some function of this self-observed clock velocity, hence the expression describing the epoch will contain terms involving the setting clock velocity. By the principle of relativity the "velocity", more properly the "rod-to-clock quotient" of

> light so measured will be the *same* on all platforms in uniform relative motion …[82]

He goes on to explain that Einstein uses the one way velocity of light in the Lorentz-Poincaré transformations but:

> From the contractions of length and clock rate with motion contained in these transformations it is possible to determine the epoch of the moved clock velocity, that is, it is *not c*, contradicting the initial postulate. This has been recognized in the Special Theory of Relativity to the extent that the use of moved clocks for establishing distant epochs is prohibited (or they are to be moved "infinitely slowly", which means the measurement would never be made!). Instead, distant clock epochs are prescribed to be made by light signals *assigned* the velocty *c*, by which indeed the resulting measured value is *c*, but this is a rigamarole, not a legitimate measuring procedure….
>
> This inconsistency of … [Einstein is contrasted with Ives' procedure in which the] … procedure of setting distant clock epochs by moved clocks then gives the "velocity" of a one-way signal as

$$\frac{c}{1 - c/q\,[(1+q^2/c^2)^{1/2} - 1]}$$

> where q is the self-measured velocity of the setting clock. … The principle of relativity is conformed to, there is no paradox, no internal contradiction, no prohibition of the

[82] Ives, Herbert E., (1953), "Genesis of the Query 'Is there an Ether?' ", *Journal of the Optical Society of America*, p. 218.

> use of clocks, no resort to "definition" unsupportable by measurement.[83]

To elaborate on some points made earlier, Einstein was attempting to preserve the laws of physics as being invariant when described from any frame. He could not stand the lack of symmetry in the Maxwellian equations that did not match the symmetry of the actual physical situation with respect to the motion of the magnet and conductor – where it did not matter what was moving, the magnet or the wire (conductor), the net result was a current flowing in the wire. However, the basic error in Einstein's thinking was as follows: different descriptions from different frames do not mean that the laws are different (i.e. the laws being reaction rates/velocities that are being observed in one frame from another frame (moving near the speed of light)). One could apply 'correction factors' to one's moving frame of reference so that the scientists in both frames get the same results. However, this does not mean that in reality, the speed of light remains the same in any frame of reference! Indeed, Ives states in his own paper that:

> Thus in these equations we find that it is not, as in the Poincaré revision, the velocity of light which is equal to *c* on all moving platforms, it is the [rod-clock] quotient ... which has the value *c* on all platforms. That a quotient involving readings of rods and clocks, in combination with terms describing their method of use – a quotient derived in full recognition of the independence of the velocity of light from the source or other matter – can have the

[83] Ibid., pp. 218 – 219.

> constant value *c*, is understandable, while the paradoxical "constancy of the velocity of light" is not.[84]

Ives' revised equations for the Lorentz transformation, take into considerations four assumptions: Firstly, it is now an established fact that atomic clocks slow down as a function of speed, as shown in the experiment of Ives and Stillwell and as is indicative from the work of Pound and Rebka (the temperature-dependent Mossbauer Effect) and the experiment of Hay et al (the rotating wheel experiment employing mechanical acceleration). Secondly, it appears that the velocity of light is independent of the speed of the source, that is, if the source is moving at *X*, light will not move at *X*+*c*, once generated with respect to the source. Thirdly, although there is no proof that rods would contract, Ives assumed that as a premise, based on the null result of the Michelson-Morley experiment. Fourthly, there is the assumption that the slowing down of atomic clocks has nothing to do with collisions or interactions with other particles in space. If assumption 3 and 4 are incorrect, then the above equations of Ives would have to be modified. Microbit theory suggests that the interaction between the constituents that form the atomic clock and other particles affect the clock's particles, as speed increases (refer to the discussion of the 'drag factor' in Chapter 1). All these possibilities are both causally logical – what is not causally logical is that the speed of light in vacuum remain constant for any frame. It is this latter issue which leads to internal inconsistencies in special relativity, the very foundation upon which the phantasmogorical general relativity of curved spaces etc., is based, and it is this inconsistency which is circumvented in Ives' transformation equations. The other significant point to note is that the Lorentz transformations describe a one-way light signal, whereas

[84] Ibid., "Revisions of the Lorentz Transformations", p. 130.

experimentally *c* had been derived from two-way (out and back) velocities. In Ives' revision of the transformation equations, he incorporates the one-way velocity, and the speed of light *c* remains constant only because of the way we measure things from one frame to another using man-made instruments, not because it is the same no matter what frame. He cautions (as does M. Muslim in Chapter 1) that we must make a distinction between what we consider as being "simultaneous" and "synchronometric", the latter being a product of our measuring tools and the former being the reality of what actually happens in space.[85] As physicist Paul Marmet elaborates in his exhaustive treatment of the modification of Newtonian physics, in explaining physical phenomena, when we try to synchronize clocks by any known mechanism – using two clocks, or using a third lock as a reference for the two primary clocks, in moving frames of reference – we are "fooled" whatever technique we use to determine our motion. This happens because the change in the display times on two clocks is the same amount, even though the actual time taken by light to travel both ways is actually different and this happens because:

> We see that this constant number representing the absolute velocity of light is just a mathematical illusion. We have shown that it is due to the different clock rate on the moving frame [i.e the clock that is moving actually slows down physically with speed as do atomic clocks] and to the clock synchronization of the moving observer. In fact, the velocity of light is an absolute constant in an absolute frame at rest but due to the different clock rate on the

[85] Ibid., p. 129.

> moving frame and to the synchronization, it appears constant in any frame.[86]

In other words, since the clocks on frames moving relative to one another at speeds approaching that of light are not sychronizable in any synchronization attempt using light itself or even by a third clock which moves from the first clock on the platform to the destination second clock, the change in the displays in the first and the destination second clock turn out to be the *same* even though the *actual* travel time of light both ways is *different*. This same change in display time in the respective clocks leads to the *illusion* and illogicality of the constancy of the speed of light in *any* frame, which forms the basis of Einsteinian Relativity.

Further Considerations on Light

Continuing on the subject of the true nature of light, according to the microbit model, the reason why starlight bends around the Sun is indeed because of the gravitational field that acts like a lens akin to refraction. The refraction, though, is due to the g-particles pulling the photon particles inwards according to the differential 'pressures' discussed on pages 45 to 50 of this book. This is our causal explanation behind the calculations, which, in fact, do not even require Special or General Relativity.

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[86] Refer to the book *Einstein's Theory of Relativity versus Classical Mechanics*, by Paul Marmet at the website:
http://www.newtonphysics.on.ca/EINSTEIN/Appendix3.html

The Sagnac Effect and the Disproof of Relativity

In 1913[87] and 1914[88], the scientist M.G. Sagnac described an experiment that he had performed that disproved Einstein's theory of relativity at its core. Ives succinctly describes Sagnac's experiment, in his 1938 paper, "Light Signals Sent Around a Closed Path", that mathematically corroborates Sagnac's theory and disproves the relativists' way of getting around the results of the theory by specious arguments:

> According to the Sagnac's experiment two simultaneously emitted light signals are sent in opposite directions around a closed path, the whole optical system being in rotation about an axis perpendicular to the plane of the apparatus. The two signals upon returning to the point of origin on the apparatus are found to have taken different times, corresponding to the velocities of light of $c+rw$ and $c-rw$ where c is the velocity of light as ordinarily measured by methods involving no rotation, r the radius of the circle described by the observation point and w is the angular velocity of the light source and observation point as measured by a clock and scale on the supporting platform.[89]

The Sagnac Effect agrees with microbit theory of light where light speed is *not* affected by the motion of the *source* and where light speed is not the same for all frames of reference in terms of

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[87] Sagnac M.G., (1913), *Académie des Sciences (Paris)*, *Comptes rendus*, pp. 157, 708 and 1410.
[88] Sagnac M.G., *J. de Phys.*, (1914), pp. 4, 177–195
[89] Ives, Herbert E., (1938), *J.O.S.A*, "Light Signals Sent Around a Closed Path", pp. 41– 44. (See also *The Einstein Myth and the Ives Papers*, pp. 296 – 299, where this paper is presented in full).

observers or *receivers* of the signal. In the microbit theory, the speed of light is independent of the source because the ambient photons in space are generated by the activity or motion *in* the source itself. Then as the source moves in that space, it simply continues to agitate the space around it, thereby agitating the photons which 'vibrate' and transfer energy to neighbouring photons in a chainlike effect. It is therefore the 'pulse' – caused by this chainlike effect – that travels long distances (like a wave/pulse) and this is independent of the source's motion. However, an observer or receiver of the signal is free to catch up to the wave/pulse and hence the speed of the wave, or in this case, the photon pulse, and consequentially the speed of light, will indeed be seen to be either $v+c$ or $v-c$.

It must be noted that the Sagnac effect has been measured and confirmed to be accurate numerous times during the 20th century. As far back as 1925, Michelson and Gale[90] showed that electromagnetic signals sent in opposite directions around the earth took different durations. H.R. Bilger has recently shown, to an accuracy of 10^{20} that the Sagnac effect holds, using a ring laser.[91] The ring laser gyroscope uses the phase shift of a rotating Sagnac interferometer, where there is a phase shift in light travelling in both directions, creating a Doppler shift in frequency, in the opposite directions.

Microbits and the Observational Case against General Relativity: Double–Star Systems

Let us then tackle an anomaly that has been facing astronomers and astrophysicts for years. This is the case of the 8th magnitude

[90] Michelson A., Gale, H. , (1925), *Astroph. J.*, pp. 137–145.
[91] Bilger, H.R., IEEE Trans. 44, No: 2, p. 468 – 470.

binary star system DI Herculis, that is located approximately 2000 light years from the sun. The two stars revolve around a common centre of mass every 10.55 days. Astronomers Guinan and Maloney have found the apsidal motion of only 1.05 degrees per century. This is one-fourth that of the classical and relativistic effects combined. (The total predicted apsidal motion per century is 4.27^{o}, with 2.34^{o} from General Relativity and 1.93^{o} from classical Newtonian Physics).[92]

It is noteworthy that although numerous explanations have been hypothesized for explaining the motion of DI Herculis, they have all failed. If there is a third body, there does not seem to be evidence for orbital perturbation and computer models and other binaries do not appear to be disturbed by third bodies to account for such binary star motions. The unusual stellar atmosphere explanation shows no anomalies in visible or ultraviolet. There are also no unusual magnetic fields that have been detected as well as no extreme stellar winds. Are there tipped rotation axes? The spectra, to the contrary, reveal a vertical orientation. In addition, this binary star system's internal structures are not detected to be messy and unusual and examination of other binaries does not reveal such messy structures.[93]

Yet, as it is mentioned several times in the Robert Naeye's article on these binary stars, most scientists are unwilling to consign general relativity to the trash heap, or, alternatively, to modify it, as has John Moffat, with his non-symmetrical gravitational theory which gives precisely the correct precession rate, using the same data. Indeed, John Moffat's theory also has been applied to the motion of Mercury successfully. In the article "The Sun's quadrupole moment and perihelion precession of Mercury", by L.

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[92] Naeye, Robert, (1995), "Was Einstein Wrong? The Mystery of DI Herculis", *Astronomy*, 23, p. 54.
[93] Ibid.,*Astronomy*, p. 59

Campbell, J.C. McDow, J.W. Moffat and D. Vincent all of the University of Toronto, they state that:

> The residual relativistic precession of Mercury is by far the most important Solar System test of general relativity (GR), as it is sensitive to post-newtonian parameter β that measures the nonlinearity in the superposition laws for gravity.[94]

Moffat's theory therefore takes into consideration the post-newtonian parameter and is based on a non-symmetric field structure. John Moffat has himself clarified to the authors that he believes that "the problem of the periastron shift of DI Herculis and its measured disagreement with general relativity, cannot be solved by any internal properties of the two binary stars. It must have something to do with gravity. Maybe there is another astronomical explanation, but until now no one has been able to resolve the mystery."[95] A. Claret of the Astrophysics Institute of Andalusia (Spain), in critiquing Moffat's theory, elaborates in a comprehensive paper that:

> [Moffat's] non-symmetrical theory of gravitation should also be able to fit the data for the other systems and not only for the systems used in pre-calibration. We can perform such a test….One can conclude that the relativistic corrections given by GR are in better agreement with observations, than those by Moffat..[96]

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[94] Campbell, I.; McDow, J.C.; Moffat, J.W.; Vincent, D., (1983),"The Sun's quadrupole moment and perihelion precession of Mercury", *Nature*, p. 508.
[95] Personal communication with author, dated March 16, 2001 (via email).
[96] Claret, A., (1997), "The apsidal motion test of stellar structure in relativistic systems", *Astronomy and Astrophysics*, p. 19.

In addition, in Moffat's revised theory of 1989, there are too many free parameters.[97] According to the microbit model there is no separation between the external space around the stars and their internal rotation. The internal space (motion in the respective stars) and the external space, are integrally and seamlessly interconnected, in that the joint effect on the shared space around the stars due to the rotation of the stars gives the particular motion, which is so at variance with general relativity. Our proposed solution is somewhat connected to Moffat's consideration of the effect arising from a star's rotational distortion that creates a quadrupole moment of a star's gravitational field, but the structure that we believe causes the periastron shift is something rather different as shall be discussed.

Proposed Solution to the Anomaly of DI Herculis

In order to solve the problem of DI Herculis, we must, in the very first place, determine why perihelion advance type motion occurs in the first place. In this section we will be presenting the actual reason why we think that such motion occurs and then apply it to solve the problem of DI Herculis and other similar systems that are at variance with the calculations of General Relativity and Newtonian Mechanics. Now the first point that must be realized is that perihelion advance is a type of a cycle in nature and every cycle in nature is driven by another underlying cycle. But what is this immediately underlying cycle that causes such a motion? Take the sun for example: Mercury has an additional advance of perihelion not accounted for by the affect of the other planets' motions, which is 43 arcseconds per century. According to the microbit concept of gravity, a cycle such as this implies that something is happening to the gravitational field and this means that some

[97] Ibid., p 20.

change is occurring in the object itself, in this case the sun. This is because the density of the surrounding g-particle field is dependent on both the density and the density distribution of the object that gives rise to the field. Since there is a cyclical pattern to the perihelion advance not accounted for by the other planets' affect on Mercury's orbit, there must be a cyclical density change in the sun. We believe that this density pattern change leads to a change in the centre of gravity of the sun, and that such a change is itself cyclical. In fact, as shown in Figure 9, the centre of gravity rotates because of the rotation of the inner core, and that the inner core's rotation is the cause of the additional perihelion advance of Mercury. In other words, the perihelion advance is synchronized with the inner core's rotation. For illustration's sake, if the inner core of a star makes such a 360^{o} circuit every 100,000 years, a planet close to it would take 200,000 years for a complete cycle of perihelion advance. Another planet farther out might take 500,000 years and so on. In fact, like Mercury, the inner planets of our solar system also have additional perihelion advances that have traditionally been calculated by General Relativity; they grow smaller in magnitude, however, with increasing distance from the sun .

At the same time as the inner core moves in a circular path, transcribing a circular locus of the centre of gravity (the smallest inner circle in the figure), the inner core is *also* rotating about its own axis (the larger arrow in Figure 9), though, of course, at a different rate than the outer layers of the sun. In summary, the core has two motions connected to this phenomenon:

1. The core circulates, thereby shifting the sun's centre of gravity, hence causing perihelion advance. This circulation is denoted by the large grey arrow in Figure 9.

2. It rotates about its own axis whilst slowly completing the circuit mentioned above in 1.

At the present time the empirical evidence of the motion of the inner core remains nebulous, in both senses of the word, though we are gaining more knowledge about it!

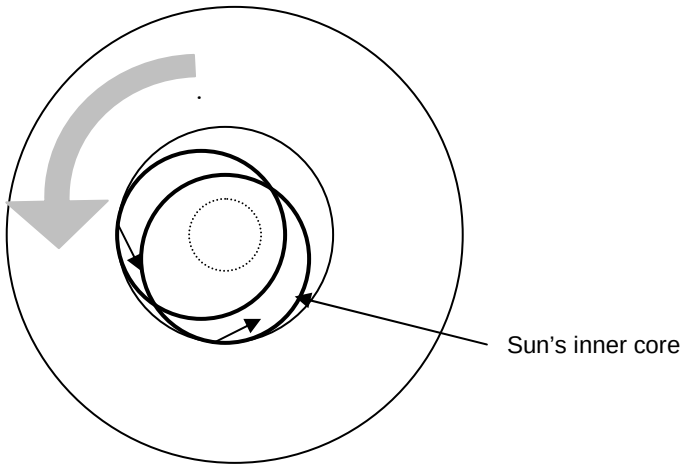

Fig. 9

The inner core of sun and its hypothesized cycle: The central dotted circle depicts the locus of the shifting centre of gravity, while the core rotates as well. For the shift to transcribe a circle (360^0), it would take thousands of years. Drawing is not to scale.

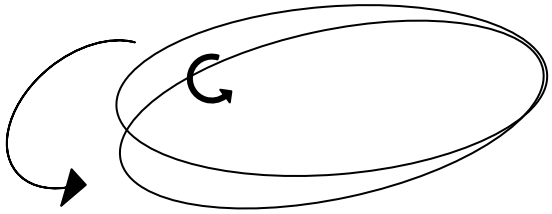

Fig. 10

Perihelion advance due to rotation of centre of gravity of the sun.

When we link this idea of the rotation of the centre of gravity to the microbits' concept of the gravitational field, we see that as the centre of gravity rotates, the whole gravitational field is being shifted for a planet engulfed in that field, and, since the g-particle field distribution is based on the inverse square law, the forces on the planet either increase or decrease at each point in the ellipse (because the distance between the centre of gravity and the planet in question would either be increasing or decreasing with the rotation of the centre of gravity for each point in the elliptical orbit). Analysing the behaviour of the orbit based on these factors, by considering a resolution of all the basic forces, based on the g-particle density distribution model, in which we consider differentials as discussed on pages 45 to 50, a net torque or moment in the direction of the rotation of the sun's core (as shown in Figure 10) is the result, thereby causing a perihelion motion (advance), as the elliptical orbit is adjusting to the slowly shifting centre of gravity, producing the characteristic 'rosette pattern' of the perihelion advance.

The 'fixes' to the mathematical equations of Newtonian physics in terms of the modifying inverse square law, or the

accurate description of the perihelion advance of Mercury using General Relativity geodesics, do not go to the physical cause which is the root reason of the advance of perihelion and, as we shall describe, that of the periastron. The strong curvature of space using the Schwarzchild metric etc. is only a mathematical construct, that has no basis in actual physical reality, because, in the first place, space cannot be curved (see Chapter 1). At best it only becomes a description of the motion using the artifice of curved space and its concomitant equations. What we are dealing with, in reality, is the net behaviour of a field of non-abstract particles, where the inner space of the sun affects the space around it, all in terms of motion in absolute space. Ives actually derived the actual motion of Mercury, from Newtonian physics, ending up with the same equation as Einstein.[98] The reason for the advance of the perihelion is that there is an additional force acting normal to a particle in motion in a gravitational field. With this force, using Newtonian mechanics, as did Ives, one can arrive at the 'Einsteinian' equations for Mercury's motion without resorting to curved space. But that still begs the question: what exactly is the cause of the extra "normal force". What is the *physical* cause? It is theorized here that it is the shifting centre of gravity of the sun, as hitherto described, that is *the* cause.

Getting back to the issue of DI Herculis and similar binary stellar systems which are at magnitudinal odds with General Relativity and Newtonian Physics, each of the stars in this binary

[98] Ives, Herbert E., (1979), *The Einstein Myth and the Ives Papers: A Counter-Revolution in Physics*, Rumford Medal Lecture 1951, "The Physical Significance of Birkhoff's Gravitational Equatons", pp. 231, and also in the same book, the brilliant Newtonian derivations related to Mercury: *Behavior of an Interferometer in a Gravitational Field*, pp.45 – 49, and: *The Behavior of an Interferometer in a Gravitational Field. II Application to a Planetary Orbit.*

system would also have a similar rotation in their respective cores as described above, and, concomitantly, rotating centres of gravity. Since the two stars rotate about a common centre of gravity, the common centre of gravity is itself also rotating, albeit at an immeasurably slow rate, and the net result is the advance of periastron. Since the periastron shift is only about a quarter that of that predicted by contemporary physics, it means that the inner cores for this class of binary systems have their shifts of centres of gravity at a much slower rate than other stars. Therefore, in summation, this stellar anomaly is connected with the physical composition and nature of rotation of the cores of the stars themselves, according to the microbit model.

The astronomer Guinan, who had been studying the system for 18 years remarks that:

> There's a slight chance there's something wrong with general relativity when it applies to massive stars…. On the other hand, a lot of physicists consider general relativity to be a sacred cow. They won't even look at our data. But theories should always be tested.[99]

Internal Inconsistency in Special Relativity

To highlight and expose the internal inconsistency and thereby falsity of Einstein's Special Relativity, in 1963, Herbert Dingle posed the following problem[100] and challenged any professional physicist or non-specialist to disprove him by publishing the

[99] *Astronomy*, p. 59
[100] Dingle, Herbert (1963), "Special Theory of Relativity", *Nature*, pp. 1248 –1249.

question in the prestigious scientific journal *Nature*. The problem, in his own words, was as follows:

> *A* and *X* are twins who separate at birth at a speed *v* such that $1-v/c = 1/5$. Each carries a clock which reads 0 at the moment of separation and thereafter reads the age of its bearer. Ahead of *A*, in the direction of *X*'s motion, and in keeping at a constant distance from *A*, is another child *B*, born at the same moment as *A* in *A*'s and *B*'s common time system and carrying a similar clock synchronized with *A*'s. Likewise, in the rear of *X*, and in keeping at a constant distance from *X*, is a child *Y*, born at the same moment as *X* in *X*'s and *Y*'s common time system and carrying a similar clock synchronized with *X*'s.
>
> When *X* is 6 years old he passes *B* and they exchange photographs which have just been taken. *B*, and therefore *A*, is then 30 years old according to the Lorentz transformation. Further, when *A* is 6 years old *Y* passes him and they exchange recent photographs. The Lorentz transformation then shows that *Y*, and therefore *X*, is then 30 years old. All assemble later and agree on the evidence of the photographs, that *A* is 30 when *X* is 6 and *X* is 30 when *A* is 6. I call this a contradiction.
>
> Table 1 corresponds to Einstein's statement, with *A* fixed at the origin of the *K* system and *X* at the origin of the *k* system, and we see that *X* ages more slowly than *A*, as he concludes. But we also have Table 2.

Table 1

		X is born	*X* meets *B*
'Stationary' (*K*) system	t =	0	30
'Moving' (*k*) system	τ =	0	6

Table 2

		A is born	*Y* meets *A*
'Stationary' (*K*) system	t =	0	6
'Moving' (*k*) system	τ =	0	30

Table 2 corresponds to my statement, with *A* and *X* still fixed at the origins of the same systems as before, and we see that *A* ages more slowly than *X*.[101]

Following publication of Dingle's problem in *Nature* the only famous physicist who responded was Max Born. Born could not show that there was no contradiction in Dingle's proof, in a letter to the editor. In fact, he just pedantically regurgitated Minkowski's diagram; furthermore, and as a discredit to Born, his response to Dingle contained *ad homenim* attacks on Dingle, for not supposedly wanting to come to an agreement with special relativity.[102] However, the fact is that Dingle stated that all the rebuttals failed to resolve the contradiction. It is not surprising, for it is indeed difficult to prove that 1=3 is correct, which is tantamount to what the supporters of Special Relativity are doing.

In summation, we can conclude that: It only makes logical sense that a thing must be a particle or conglomeration of particles in absolute space and that motion in different frames needs a

[101] Dingle, Herbert, (1963), "Special Theory of Relativity", *Nature*, pp 1248 –1249.
[102] Ibid., pp. 1287 – 1288.

translation factor. Knowledge of conditions of other frames of reference enables communication, to make sense of things, that is, *physical motions and changes* based on *cause and effect*. If we are all in motion and there is no frame of rest from which we can observe things does *not* mean that there is no absolute space and that we must do away with this concept. This is like throwing the baby out with the bathwater – which is what has been done in contemporary physics.

We have argued that such arguments from contemporary physics are naïve because the overarching principle has internal and external inconsistency. One may have a simple theory or elegant looking theory, but if it is internally inconsistent in its application or structure, it cannot be true in the realm of reality. Such basic points are neglected in an effort to cling on to Einstein's theories by many a scientist or writer. For example, long after Ives had developed his theory based on Absolute Space and Time, it was acknowledged by Adolf Grünbaum, the German-born philosopher of science, that Ives theory had:

> … *the same predictive power* as Einstein's relativity theory. Further, in his latest position, Grünbaum retreated to claiming merely that Ives' theory is *ad hoc* in that it has an assumption (absolute space) in its foundation which he deemed it impossible ever to empirically verify. Also, he complained that Ives' theory predicts nothing in the way of feasible experiments and observable results that Einstein's theory did not predict. Grünbaum argued that Einstein's theory is less complicated since it assumes less and therefore has less to experimentally establish or verify.[103]

[103] *The Einstein Myth and the Ives Papers*, p. 74.

The present day scientific community and others must realize that internal consistency and external consistency (empirical corroboration) are the hallmarks of a theory that is along the correct lines as far as methodology goes, not naïve notions of simplicity and beauty. We neglect this fact at our own peril.

The interesting question is whether Einstein knew of Ives' theoretical and experimental work. As Richard Hazelett points out:

> As I have shown, it was only in 1938 that a rival theory to that of relativity matured into an unambiguous statement at the hands of Ives… Speaking to a reporter, Einstein lauded the Ives-Stilwell experiment as the most direct proof that had been brought forth in support of *relativity.*[104] An editorial the same day was titled, "Einstein Triumphs Again".[105] So far as I have been able to determine, Einstein after that never again publicly mentioned Ives and his theoretical work. It cannot be said by way of excuse that Einstein was ignorant of Ives' theoretical work. A relative of Ives told me that Ives had a number of friendly meetings with Einstein, some at Princeton and others at scientific conferences, at which Ives theoretical work was discussed.[106]

Here we see that although the Ives-Stillwell experiment supports equally Ives' theory as well as Einstein's, Einstein kept silent of this fact and let the public and scientists believe that it supported only his theory. Although Ives was honoured for his scientific achievements that included Wirephoto and the first long-distance exhibition of television, his significant and crucial work on

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[104] For a differing view refer to: *New York Times*, 27 April 1938, p.25.
[105] Ibid. *New York Times,* p. 22.
[106] Ibid., *The Einstein Myth and the Ives Papers*, pp. 84-85

theoretical aspects of the foundation of physics pertaining to space and time remain almost unknown.[107]

The Problematic Nature of the Inflationary Universe Model

A consequence of the misapprehensions gained by the intermeshing of special and general relativity and quantum mechanics is *inflationary theory*, which was introduced by some contemporary physicists to answer several profound questions in the standard big bang model. Why, for example is the universe so uniform and homogeneous? Two regions of the sky on diametrically opposite sides of the sky appear to be the same in respect of their general features; however, their spatial separation is more than 24 billion light years. Light has been travelling for only about 12 billion years, so the two disparate regions have not been in contact. Heat or light could not have traversed the gap to effect a mutual homogenization of their respective densities and temperatures. Somehow the uniformity of the universe must have existed prior to the expansion; however, the standard big-bang theory does not explain how. On the other hand, why did the early universe possess minute density variations, which in fact have been so crucial for the evolution of the galaxies, stars and life on earth?

The difference between the kinetic energy and gravitational energy expressed as a ratio is so close that, by present estimates, the ratio must have been exactly one or close to one (within one part in 10^{18}). Inflationary theory attempts to resolve the problems, but it appears like an epicyclical theory that convolutes and complexifies things, still begging the question of the issue of precision, which is not eliminated, for precision is required to produce the fields that produce inflation! Inflationary theory was concocted to escape the

[107] Ibid., *The Einstein Myth and the Ives Papers*, p. 85

early precision that must be required to be inbuilt into the Big-Bang event itself, and in trying to circumvent that, has not escaped the problem of precision, but just transferred it. The present state of affairs is such that we are expected to believe in these absurd mathematical universes which, for example, have always been there, or arose from 'nothing':

> In 1983 James B. Hartle of the University of California at Santa Barbara and Stephen W. Hawking of the University of Cambridge applied quantum mechanics to the universe as a whole, producing a cosmic wave function analogous to the wave function for atoms and elementary particles. The wave function determines the initial conditions of the universe. According to this approach, the usual distinction between future and past breaks down in the very early universe; the time direction takes on the properties of a spatial direction. Just as there is no edge to space, there is no identifiable beginning to time. … Last year Hawking and Neil G. Turok, also at Cambridge, suggested the spontaneous creation of an open inflationary bubble from nothingness.[108]

If there is a problem of the existence of the precision of the initial set-up, then so too is there a problem in the precision required to set up the conditions for the inflationary state at the beginning of the universe. One cannot escape the precision of the Universe, set-up at some stage, by trying to phase out problems with inflationary theory. Inflationary theory only transfers the precision problem to another set of parameters that have to be as precise or even more so. Even Alan Guth, the originator of the

[108] Bucher, Martin A., and Spergel, David N., (1999), "Inflation in a Low Density Universe", *Scientific American*.

inflationary idea candidly admits that "the horizon problem is not a failure of the standard big bang theory …The uniformity of the observed universe is built into the theory by postulating that the universe began in a state of uniformity."[109] *This uniformity must be set or designed at the beginning*, which is exactly what the Microbit Model states.

Further Contradictions among Physicists, Cosmologists and Educationalists

Many physicists seem to escape from the fundamental questions that border on the collapsing the house of cards upon which the fundamental assumptions of space and time of present day physics and cosmology are built. There is the fallacy of special pleading. An example of physicists consciously or unconsciously misleading physics students and the general public on relativity and experiments can be found in the book *Basic Concepts of Relativity*. In it, the authors state that:

> …measurements [of double stars] show no such eccentricities in the orbits of double stars observed from the earth. [110]
>
> The results are consistent with the assumption that the velocity of the light is independent of the velocity of the source. De Sitter's conclusion was that if the velocity of light is not equal to c but equal to $c + kv$, then k experimentally must be less than 2×10^{-3} … In 1977

[109] Guth, Alan H., (1997), *The Inflationary Universe: The Quest for a New Theory of Cosmic Origins*, p. 184.
[110] Resnick, Robert and Halliday, David, (1992), *Basic Concepts in Relativity*, Macmillan Publishing Company, p. 26.

> Brecher …observing x-rays emitted by binary stars, claims to have reduced this limit to 2×10^{-9}.[111]

The authors, Resnick and Halliday failed to point out the most significant statement of Fox (that the experimental evidence against the theory is slighter than imagined) whom they are using as a reference to discuss the issue of emission theories and proceed as if everything is perfectly fine. This is not to say that the emission theory is correct. Rather the difficulty in disproving it and hence dismissing Galilean Relativity outright, has not received attention or has been suppressed. Another fact to be noted is that although the Michaelson-Morely experiment proved that there is no aether which is being dragged with the earth, in that their experiment showed that there was no fringe shift in the interference of the beams, it has not, logically speaking, demolished the emission theories.

Take another example. In discussing the twin paradox physicist James A. Coleman explains in one of the earlier accounts of special and general relativity for the lay public, entitled *Relativity for the Laymen* and even endorsed on the jacket by Einstein as "[giving] a really clear idea of relativity", that:

> This is the paradox: At the end of such a rocket trip will the people on earth be older than the rocket men, or will the rocket men be older than the people on earth? Both views are correct according to the Special Theory. Yet they are contradictory and both cannot be true. You are now left to ponder this situation in quiet contemplation, without hindrance from the author.[112]

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[111] Ibid., p. 26

[112] Coleman, James A., (1958), *Relativity for the Layman: A Simplified Account of the History, Theory, and Proofs of Relativity*, p. 68.

Basically what he is saying is that you are left to ponder on some sublime concept, which in reality is nothing but a contradiction, as there are no real paradoxes in nature for it is built on cause and effect relations. The fact that we have been resolving so many so called paradoxes in nature (physics and biology, in particular), should have made us aware by now that there cannot be any real paradoxes in this universe. Paradoxes only reside in the human mind and human misunderstanding, or lack of knowledge.

Mendel Sachs, Professor of Physics at State University of New York and 'Einstein scholar and supporter', on the other hand believes that:

> If one should nevertheless insist that the Lorentz transformations do imply physical changes, it must mean that the theory of relativity is *false*, as a scientific description of real matter. Indeed, many of the critics of Einstein's general relativity, such as Herbert Dingle, have used this reason to claim that this is a false theory. Dingle asks the question: Which of the relatively moving clocks is one that is slow compared to the other? Not arriving at a logically sound answer, he concluded that the theory of relativity is false. But his conclusion is false because he tacitly assumes (with the rest of the physics community) the interpretation of the Lorentz transformations in terms of physical change. If the rest of the physics community is correct in this interpretation, then Dingle would be correct that the theory is false (according to what almost everyone says its transformations mean).[113]

[113] Sachs, Mendel, (1988), *Einstein versus Bohr: The Continuing Controversies in Physics*, p. 209.

Sachs does not see Einstein's theory with respect to the Lorentz transformations as being one that has any physical effect. To him it is only descriptional with respect to frames of references. In fact, the way the situation has been developing in physics and science in general, is that the late physicist Richard Feynman is one of the few major relativistic physicists who seems to be implying a causal interpretation for the relativistic effects and in this sense is closer to the causation-based ideas of microbit theory, as he states that it is the object which is travelling at close to the speed of light that will change due to acceleration etc. and not the object that remains stationary.[114] Although acceleration may have no effects, he is at least on the right track in postulating physical changes.

All these discussions might lead to the question as to whether there is a formal cover-up about the erroneousness of Special and General Relativity, even more elaborate and dubious than just a personal intransigence in the physics community to avoid the embarrassment of backing a wrong theory or of losing remuneration or prestige at universities, if the theory is found or exposed to be incorrect?

Astrophysicist G. Wallace in his book, *The Farce of Physics*[115] states that he published a paper in 1967 entitled "An Interplanetary Radar Test of Relativity" in which he claimed that the radar investigations showed that the velocity of light is not independent of the source and is "some form of c+v". He recounts that

> … I made the startling discovery that the NASA Jet Propulsion Laboratory was basing their analysis of signal transit time in the solar system on Newtonian Galilean

[114] Feynman, Richard, (1997) *Six not-so-easy pieces: Einstein's Relativity, Symmetry and Space-Time*, pp. 77-79.
[115] *The Farce of Physics* is available on the internet at: http://surf.de.uu.net/bookland/sci/farce/

> c+v, and not c, as predicted by Einstein's relativity theory. There is a short mention of the term [in a paper by Theodore D. Moyer of the Jet Propulsion Laboratory] as "Newtonian light time" but no emphasis on the enormous implications of the fact![116]

Wallace subsequently tried to bring this up as an issue by submitting a letter for publication to *Physics Today*, but he was rejected thrice. Now whether Wallace's results were accurate or not, the fact is that he was not given a fair hearing. In this connection we quote the 'out of the normal' mention of non-relativistic methods to determine astrophysical distances, by the premier space agency in the world! The way NASA scientist, Moyer, describes his equation is as follows:

> The first term on the right-hand side is the *Newtonian light time* [emphasis is ours]; the second term is a relativistic correction which accounts for the reduction in the coordinate velocity (below c) due to the mass of the Sun and other bodies (such as Jupiter and Saturn).[117]

Conclusion

We have examined the nature of the universe that has indeed had an origin and have discussed a unifying model based on this. Yet

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[116] Wallace, G. Bryan, (1994), "Publication Politics", *The Farce of Physics*, pp. 5 –6.

[117] Moyer, Theodore D., *Celestial Mechanics: An International Journal for Space Dynamics*, (1981), "Transformations from Proper Time on Earth to Coordinate Time in the Solar System Barycentric Space-time Frame of Reference: Part 1", p. 47.

what are the implications of the origin of the universe, absolute space and the origination of everything from only one type of particle? For example, does our theory imply chance or design? And what of the human mind – how does this view change our concept of the mind and consciousness? In the upcoming Volume 2, we take on these and other perennial issues, implicative of microbits and a new truly unified view of nature, that fundamentally changes the way we view our existence in the cosmos, and our relations with its multifarious components and processes.

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Appendix A

Full References and Selected Endnotes for G. Burniston Brown's complete article.

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Endnotes for G. Burniston Brown's article.

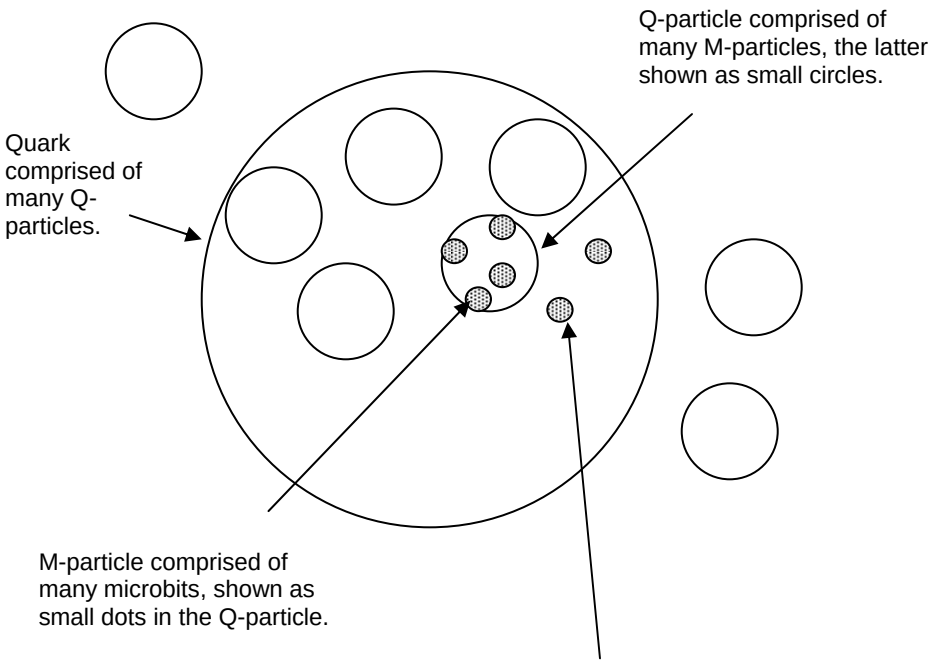
1. The substance of lectures given to the Royal Institute of Philosophy, University College Chemical and Physical Society, The Institute of Science Technicians, etc.
2. Quoted from the Rutherford Memorial Lecture to the Physical Society 1954 by P. M. S. Blackett (Year Book of the Physical Society 1955).

3. Gravitational waves with velocity c and the velocity addition formula should be included (Keswani 1966).
4. I am indebted to Lord Halsbury for pointing this out to me.
5. Einstein and others call it Mach's principle, but it is not a principle – it is a physical hypothesis.
6. Newton considered this possibility (see Brown 1943).
7. Relativists seem to be rather shaky on dimensions: has not Eddington told us that the mass of the Sun is 1.47 km, and have we not been favoured with a revelation from Ireland that 1° centigrade = 3.804 x 10-76 seconds (Synge 1960)?
8. They can be derived without the principle (see Capildeo 1967).

Appendix B

Structure of the Quark Model

Figure A: Structure of the Quark Model



In Figure A, the quark is shown to be built of smaller particles. The M-particle is itself comprised of microbits. In fact, the M-particle is the smallest particle next to the microbit, which is the smallest of all particles. The microbit comprises the M-particle by close packing. All other particles, other than the quark, that is, are structured in a similar way to the quark in terms of the principle of hierarchy of particles until we reach the smallest one – the microbit itself. This diagram is not to scale, and we do not know how many

levels we need to peel before we reach the microbit itself. Here, we are just presuming three levels below the quark. Note that all particles are surrounded by a field of other particles, and the density of the surrounding particles is based on an inverse square law density distribution (not depicted here). For example, the M-particle circulates around the Q-particle, as well as the Q-particle being comprised of the M-particle. We do not know how many Q-particles comprise the quark or how they are packed. The intent of this depiction is merely to illustrate the hierarchy of particles and their groupings.

Index

Index