CHAPTER 9

General Discussion

Introduction

Having outlined what I regard as the physics of Creation by concentrating on the essential foundations and features of the theory, there remains much that now needs discussion, particularly as a result of the author having confronted a problem in the theory as originally developed. That problem is at the very heart of the theory of gravitation where it is unified with the physics we associate with electricity and magnetism.

As readers have seen, the theoretical derivation of G, the constant of gravitation, has been based on gravitation being an electrostatic phenomenon arising from the displacement of charge of density σ from space taken up by the gravitons needed to provide the dynamic balance for the mass of matter which thereby experiences gravitational attraction. The self-repulsion of σ means that holes in it will be attracted to one another and, by their coupling with matter, rendering matter self-attractive and so establishing the phenomenon of gravitation.

In the author's earlier theory, the conventional assumption was made that gravitation had to be unified with electromagnetic action, but such assumption must fail for the reason now to be explained in the first part of the following discussion.

Though much of this chapter will be devoted to discussion of several other topics of interest peripheral to the main theme already covered, there is also need to give special attention to an important issue of technological importance. This probably warrants a book of its own, but it is so diverse in character and is

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ever evolving, besides lacking in academic recognition, that it seems best to mention it but briefly in this final discussion section rather than give it a chapter or two of its own. I refer here to the prospect of our being able, as it were, to mimic some of the creative forces in Nature by tapping into the energy resource of the aether in an effort to extract energy which we can use to replace our dwindling oil and gas reserves.

This, therefore, is the scope of this chapter 9 and it is hoped the reader will find it of interest, whilst appreciating that it is no easy task to find that my study of electrodynamics, as motivated by the desire to forge the connection with gravitation, though having spin-off pointing to new energy technology, has, in the process, failed on the gravity front. Thankfully, however, the pillars on which the theory stood, meaning the formulae for those 'coded messages' concerning the basic dimensionless physical constants, stand firm. Thankfully, also, the theory as it now exists is much simpler and easier to understand, since the theory of gravitation is now devoid of dependence upon the intricacies of electrodynamics as rooted in the Fechner hypothesis and its quantum electrodynamic equivalent.

The Neumann Potential

The Neumann potential dates from 1845 and is an empirical formulation derived from electrodynamic theory by which the energy potential of two interacting current circuit elements, here denoted QV/c and qv/c, is:

$$Qq(V.v)/Rc^2 \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (9.1)$$

where R is the spacing between two charges Q, q moving at velocities V, v respectively and c is the speed of light. The dot between V and v signifies that the term in brackets is a scalar product which means that if the angle between V and v is θ, then the product has the value $Vv\cos\theta$. For our purposes here, it is noted that, by applying this Neumann potential to calculate the

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force of attraction as between two charges moving mutually parallel at the speed of light with respect to the electromagnetic reference frame in which matter is seated. I did in my earlier theory obtain a force of mutual attraction in which the $(V.v)/c^2$ term reduced to unity. I seized upon this situation to build a theory of gravitation around the electrodynamic formula, assigning charge to gravitons according to volume of continuum charge σ that they displaced and so arrived at the same value of G as that derived above in chapter 2.

The problem that arises is that the Neumann potential applies only to actions which are supported by a quantum electrodynamic process akin to that found for electron currents. That empirical formulation does not have a textbook derivation from first principles but when we really delve into such a first principle derivation it becomes evident why the gravitons as a current source behave differently from electrons as a current source.

The analysis is as follows. Considering two charges Q and q spaced apart by that distance R, energy is transferred at speed c between their kinetic energy and the Coulomb interaction energy and, owing to its momentum and mass-equivalence, this results in a force given by:

$$(1/c)(\delta E/\delta R)(\delta R/\delta t) \quad \ldots\ldots\ldots\ldots\ldots\ldots (9.2)$$

where:

$$E = T\,[\delta(Qq/R)/\delta t] \quad \ldots\ldots\ldots\ldots\ldots\ldots (9.3)$$

Here E is the energy in transit between the potential and kinetic forms and T is the time taken for energy to traverse a distance R at speed c.

Equation (9.3) reduces to:

$$E = -(R/c)(Qq/R^2)(\delta R/\delta t) \quad \ldots\ldots\ldots\ldots\ldots\ldots (9.4)$$

and so the force term given by (9.2) becomes:

$$(Qq/R^2c^2)[(\delta R/\delta t)^2 - R(\delta^2 R/\delta t^2)] \quad \ldots\ldots\ldots\ldots\ldots\ldots (9.5)$$

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Since $\delta R/\delta t$ is the velocity component along the line of R and $(-\delta^2 R/\delta t^2)$ is the acceleration term given by the square of the velocity component at right angles to R as divided by R, then we see that (9.5) reduces to:

$$(Qq/R^2c^2)U^2 \quad \ldots\ldots (9.6)$$

where U is the relative velocity between Q and q.

By supposing that there is an electrodynamic frame of reference in which elemental current elements as individual electrons each comprise two charges -e and -e moving with opposite velocities that are each half that of the primary charge, the above force expression has four components. The U^2 term becomes:

$$(V - v)^2/4 - (-V - v)^2/4 - (V - v)^2/4 + (-V + v)^2/4 \quad \ldots\ldots (9.7)$$

which emerges as 2(V.v) and so makes the force term (9.6):

$$2Qq(V.v)\ R^2c^2 \quad \ldots\ldots (9.8)$$

When this force is integrated with respect to R from R to infinity, we find that it corresponds in magnitude to double the empirical term (9.1) that we refer to as the Neumann potential.

This means that the magnetic field set up by any electron current is really double that we have assigned from our measurements but do note here that we are delving into action at the truly fundamental level and have not accounted for the reaction effects of any charge that might be moving in that field. This introduces us to the problem of the gyromagnetic reaction.

That assumption introduced in making the step between (9.6) and (9.8) dates from classical physics of the 19th century and is known as the Fechner hypothesis. Its modern equivalent is a feature of quantum electrodynamics by which an electron in motion is accompanied by the statistical presence of electron-positron pairs created by quantum fluctuations in measure related to the kinetic energy. This adds mass and explains why the mass of an electron increases according to the formula prescribed by the theory of relativity, but also it explains how an electron

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current is conveyed. This involves the progressive creation and mutual annihilation of opposite charges e, allowing an electron to convey current, but by moving towards a positron coming in the opposite direction, sharing that action, then decaying by annihilation with that positron to leave an electron ahead in the field as if the primary electron itself is the sole mover.

The Gyromagnetic Reaction

Here, as a preliminary, it is appropriate to take note that, in deriving equation (9.6), we need not have presumed that both Q and q were leptonic in the sense that they involved charge pair creation and decay. It suffices to say that q has that property but not Q. It may then be verified that the U^2 term becomes:

$$(2V - v)^2/4 - (2V + v)^2/4 = -2(V.v) \quad \ldots\ldots\ldots\ldots (9.9)$$

as before.

Note also that, in saying that energy travels between Q and q, a distance R at the speed c, it may seem that we are ignoring what is normally assumed, namely that the energy possessed by an electric charge is distributed over its field, rather than concentrated in the body of the charge. It is an interesting mathematical exercise to work out the field distribution of the interaction component of the mutual energy of the two charges as a function of distance from either charge. The fascinating result of this exercise is, surprisingly, the fact that there is a zero net interaction energy within the sphere of radius R centred on either charge and that the interaction energy density reduces as the inverse square of distance as the radius of such a notional sphere increases beyond that distance R. This means, quite simply, that, in shedding some of the interaction field energy owing to change of R, the energy so released must traverse that exact distance R regardless of which of the two charges is to receive that energy as added kinetic energy. The reverse also applies and so T as used in (9.3) above is definitely R/c. The mathematical proof of

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this is to be found in my paper entitled: *'The Spatial Energy Distribution for Coulomb Interaction'* published in the periodical *'Lettere al Nuovo Cimento'*, **25**, 456-458 (1979).

The question then of interest stems from the fact that the energy can only travel from Q to q or from q to Q at any given instant, and there is the further complication, that we really never ever can have two electric charges in isolation from the rest of the universe, given that the aether is seething with numerous electric charges which sustain the oscillations we associate with the passage of electromagnetic waves. I can envisage, for example, a charge Q with two charges q, one on each side of the charge Q. If energy flows from Q to both of the q charges at the same time, then there need be no reaction force on Q but yet there are forces acting on both of the q charges. Looking purely at each component interaction as between any two charges in an electrodynamic system, we cannot therefore contend that action and reaction must balance. What we can say, given a choice between balance of linear action and reaction and balance of turning action as produced by a force couple, is that the latter must surely balance so far as two-charge interaction is concerned, but the former need not be in balance.

This is a vital factor in the development of electrodynamic theory, where, historically, the wrong assumption was made. Just test your knowledge of physics by considering two electric charges moving in general directions relative to one another, work out the magnetic field that one produces on the other and then apply the Lorentz force law, which you are told is valid because it is consistent with Einstein's theory. You will find that there is an out-of-balance force set up by such a charge system. Action and reaction are not equal. There is balance for the force components acting along a line drawn between Q and q but there are out–of-balance forces acting on the charges at right angles to that line.

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To get answers which fit what is observed the tests have to involve an electron current flow around a closed circuit as part of the interaction. So you see, accepted electrodynamic theory breaks down when applied to the physical underworld and the charges that move as part of the aether. So, how can we proceed? The answer is that we must explore the significance of that factor 2 in expression (9.8).

Let us now consider the action of electron current flowing around a solenoid which has a cylindrical copper core. Textbooks will tell you that each cc. of copper has as many free electrons moving through the metal as there are atoms in that 1 cc. volume. Those electrons experience the magnetic field of the solenoid and so are deflected into reacting orbits which set up a magnetic field in opposition to the applied field. By the accepted electrodynamic laws of physics it is then found that the reaction field must virtually cancel out the effect of the primary field. In theory a magnetic field cannot penetrate a lump of copper, but in reality we know that it can! We then face the problem of 'free electron diamagnetism', a problem which baffled physicists of the early 20th century. The problem was never solved. It was ignored, in a sense, by resorting to a vague notions such as one that depended on a governing rule prescribed as a law of statistics and which bears the name of Miss Van Leeuwen's theorem. It is an absurd proposition devised to get the books to balance and one that does not warrant further consideration here but I give the reference as *J. de Physique*, (6) **2**, 361 (1921), particularly pp. 372-374.

The proper approach was to see those reacting electrons as interacting with the primary electrons in the solenoid and exchanging energy as part of an equilibrium process rather than being servile in their response as if energy can only flow one way. The force which the motion of one electric charge asserts on another such moving charge is not something that is ruled by a

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mathematical formulation. It depends upon energy equilibrium criteria and may or may not exist if the energy so dictates. With this in mind, therefore, let us, for the moment, replace that factor 2 by a factor k and see where a little analysis can take us.

Let the true applied magnetic field be of strength H_0 and suppose this to be offset by a diamagnetic reaction field H_r to produce an effective field H given by:

$$H_0 - H_r = H \quad \ldots\ldots (9.10)$$

By Lorentz's force law, which we can use because H_0 is deemed to be produced by a solenoidal electron current flow or the equivalent, the force Hev/c acts on a charge e of mass m moving at speed v perpendicular to the magnetic field of strength H. This charge e is, for example, an electron in that copper core. The charge will be deflected into a circular orbit with this force in balance with centrifugal action:

$$Hev/c = mv^2/x \quad \ldots\ldots (9.11)$$

Here x is the radius of the orbit. Regardless of the direction of motion or polarity of the reacting charge, the deflection is always in the sense that results in a reaction field opposing the primary field H_0. This reacting field strength is found from the reaction current moment evx/2c, that is the area πx^2 times the current $ev/2\pi xc$.

Thus the total reaction current moment per unit volume of the field is given by:

$$\Sigma(evx/2c) = \Sigma(mv^2/2)\,H \quad \ldots\ldots (9.12)$$

from (9.11). The summations apply to unit volume . The value of H_r is, conventionally, 4π times this quantity, but we need to introduce that factor k and so:

$$H_r = 4\pi kE/H \quad \ldots\ldots (9.13)$$

where E now replaces the kinetic energy density of this reaction.

Combining (9.10) and (9.13) we obtain:

$$H_0H - 4\pi kE = H^2 \quad \ldots\ldots (9.14)$$

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With k constant and assuming that magnetic interaction energy criteria require the energy fed into the kinetic energy density to be the maximum that is possible we see that, to make E a maximum, we must have 2H equal to H_c. In turn, this means that k has to have the value 2 that we deduced above from first principle analysis based on Coulomb's law, because this gives the result that E is $H^2/8\pi$, which is the magnetic field energy density within that copper core.

There is no 'free electron diamagnetism' on this basis and we have found that the anomalous factor of 2 introduced in (9.8) is wholly consistent with what is observed, which means that the Neumann potential is no longer an empirical quantity but rather one derived from and wholly justified by fundamental theory based on Coulomb's law.

The by-product of this, however, is the implication that the aether must exist as a medium that can itself react to halve the action of any primary magnetic field. Here is a case supporting the aether and based on pure theoretical foundation. More than this, however, we have to confront evidence that tells us that a fundamental unit of magnetic moment set up by a reacting charge in motion will be double the strength expected from standard theory. The magnetic moment to angular momentum ratio, otherwise known as the gyromagnetic ratio, will be double that implied by classical theory.

This is a phenomenon that is observed experimentally and been totally misunderstood as being attributable to an anomalous spin property, the so-called 'half-spin' feature of quantum theory. In fact it is evidence which points a finger clearly at the reality of the aether. Furthermore, it is a phenomenon that is further fully supported by the ferromagnetic properties of iron, nickel and cobalt in a truly impressive manner as one can see from my paper *'Crystal Symmetry and Ferromagnetism* in the periodical: *Speculations in Science and Technology*, 1, 281-288 (1978).

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The Law of Electrodynamics

Allowing for aether reaction and the equivalent free electron diamagnetic reaction present in electrically conductive media we have seen why the Neumann potential governs electrodynamic interaction. Also, an astute reader will have noticed that in invoking Fechner's hypothesis to advance from the force expression (9.6) we made it impossible for us to use the Neumann potential as a basis for gravitational force.

The reason is that our graviton system requires the force of gravity to arise from the interaction of gravitons that have a common motion at speed relative to the E frame, a motion that assures that those gravitons move in unison in mutually parallel directions at all times. Therefore, that expression (9.6) says that, since there is no relative motion, there can be no electrodynamic action as between the gravitons and so no electrodynamic contribution to the force of gravity. This may also explain why, in formulating our detailed analysis of aether structure in chapter 7, we avoided completely assigning electrodynamic properties to the aether itself and so avoided magnetic field energy considerations. The latter, it seems, belong only to the province of electrons, namely the material world.

It is in this latter world, our real world, that we make the measurements pertaining to magnetic fields and electrodynamic forces, and having introduced a theoretical derivation of the Neumann potential, it is of interest now to explore how this leads us to the formulation of the proper law of electrodynamics. Here I use the word 'proper' because physicists concerned with electrodynamic action have been too willing to cut corners, as it were, and be satisfied by rules of thumb and contracted versions of electrodynamic law, such as that of Lorentz. The latter only applies to actions which arise from steady current flow around a complete closed circuit, current flow that must be that of

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electrons and cannot be that of charge displaced, as across capacitor plates, where the aether is involved.

The research on this question was motivated by the quest to connect electromagnetism and gravitation but there were also certain anomalies as to the cathode reaction forces exerted in cold cathode discharges in gas at very low pressure. I do not intend here to go through the formal analysis by which I derived the law of electrodynamics. It is of record elsewhere, as in my paper *'The Law of Electrodynamics'* in *Journal of the Franklin Institute*, **287**, 179-183 (1969).

Energy from Nowhere?

At this stage, as we approach the end of this work, I feel I must explain that after many years of developing this theory of Creation by challenging much that is today accepted as correct, particularly Einstein's Theory of Relativity, I have in recent years been drawn into the forum of discussion that concerns what some call 'free energy'. This is energy tapped as if from nowhere, meaning the 'aether'. If, as I claim, the aether is a scene of ongoing creation of matter which eventually decays but which, in the meantime, feeds our energy needs, as by the sun's radiation, then one can but wonder whether we can get into the act, as it were, and invent a few shortcuts by which to tap energy from the aether directly and so help mankind to face up to the impending energy problems of our future.

As already stated, this energy topic warrants a book of its own, but, owing to age, destined to be a spent force as a pioneer in the research arena, I wish to be remembered for my theory of the aether as outlined in this book and the many papers and earlier work I have authored.

The 'free energy' theme does, however, warrant mention in these closing pages. So, as we continue with this DISCUSSION theme, I pose the following question that could,

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I feel, have been addressed by researchers back in the 1910-1920 period when that "free electron diamagnetism" topic was much debated.

"Given that the magnetic deflection of free conduction electrons in a copper core embraced by a magnetizing solenoid will surely cause those electrons to set up a reaction field opposing the field applied by that solenoid, why cannot we draw energy from those electrons and so gain power from whatever it is that sustains the perpetual motion of electrons in atoms?"

Consider the following argument. We switch the current on in that solenoid and it produces a magnetic field H in that core. This field acts on the free electrons in the core and causes them to produce an opposing field. The back EMF induced in the solenoid will be proportional to the switching speed and the difference between H and that field reaction. The energy input will be so determined. Then, opening the switch suddenly to reduce H to zero, the reaction field will become responsible for the primary change of magnetic flux linking that core and will induce an unopposed EMF that adds power to the solenoidal current as it is reduced by the opening of that switch, no doubt by forming an arc discharge, but possibly delivering more output energy than was injected as input.

Wishful thinking you say, because everyone knows that one cannot get something for nothing, particularly energy, given our acceptance of the Law of Conservation of Energy. However, look again at the physical structure under consideration. If the diamagnetic effect were to be so overwhelming that it virtually equalled the strength of the applied magnetic field, a reasonable proposition given that there are so many electrons moving freely in that copper core at very high speeds, then the input energy would be very small. In contrast, given a little inertia in the magnetic moment and related angular momentum reactions of those electrons owing to their reacting orbital motion, we would

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see the full reaction field active in delivering energy output and that would be far in excess of the energy input.

So, here we see that standard physical doctrine of the early 20th century, doctrines we adhere to today, suggest that we can, as it were, get energy from nowhere. You say that is impossible. I say that you then have to face up to the fact that the physics you rely on is faulty. Now, why was this aspect of the subject not explored and resolved long ago?

If one begins by assuming that this is a no-gain situation then logic says that the applied magnetic field is really double the value indicated by standard physics and the reaction field is half the strength of the applied field. Then the difference in field strength during power input is the same as that during power output, given the latter is a sudden switch-off of the applied EMF but the current decay lags owing to the inertia involved. So, here, by use of simple logic one can reason that the applied field really does have to be double that of the reacting field thereby induced. That factor of 2 we deduced above by the mathematical reasoning of theoretical physics has to be correct.

So where is the error in standard physics? It resides in the fact that we formulate our laws of physics and our theories on the basis of experiment in which currents act on individual electric charges in motion, whereas certain hidden factors need consideration when numerous reacting charges are affected by those currents. In the context of the above analysis by which we derived the Neumann potential I can but point my finger at that term T in equation (9.3). The time T is the distance R divided by c. Energy travels at speed c over the distance R in time T, but that energy travels one way and the question is: "Which way?" It will surely travel in the direction, Q to q or q to Q, according to optimum energy criteria, rather than according to a man-made law that suits certain conditions that do find support by Mother Nature working according to those energy criteria. Remember

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that without energy there is no force and, whenever you rely on force equations to tell you something, do be sure there is enough energy at the right place to support what you say.

The case I put is that those free conduction electrons in that copper core are only deflected by a magnetic field to the extent that the kinetic energy of the reaction has reached its maximum level as determined by the strength of the resulting magnetic field. This may seem to be an arbitrary way of overriding the principles of accepted physics, but at least it is a process based on optimization of energy deployment and the alternative seems to be to let physics to sink in a sea of confusion, because physicists in general are too stubborn to question what they have been taught and look to others to deal with the anomalous issues that arise, but seldom get a hearing in refereed publications.

As to the scope for tapping aether energy by the method outlined above, I submit that it is not possible, even though standard physics would say it is, but do not lose heart, we will come to a ray of hope on that theme before we conclude this DISCUSSION chapter.

Concerning the Michelson-Morley Experiment

I well know that there will be some readers who wonder how, in advocating the existence of a real aether, I have disposed of the implications drawn from the Michelson-Morley experiment. This was an experiment in which rays of light were reflected back on themselves in one direction of the Earth's motion and compared with corresponding rays reflected back on themselves at right angles to that motion. No consideration was given to the fact that a ray of light encountering the energy of a ray of light coming the other way might have its propagation speed affected by that encounter, but, that aside, the experiment purported to imply that the speed of light is referenced more on the apparatus used in the test than on motion though the aether.

Now, unlike the effects in a solid material medium, where lateral field oscillations occur on the passage of electromagnetic waves, with the atomic structure of the solid absorbing the strain, the aether copes by setting up a reciprocal field oscillation. Remember that we have in the aether the structured system of quons immersed in a sea of muons. If the quons are displaced laterally in setting up an electric field as the wave propagates in a forward direction, so some of the relatively massive muons must be displaced in an opposite sense to provide dynamic balance.

This duality applies also where the quon lattice system is moving steadily along as it shares the motion through space of body Earth itself. This primary action would involve a build up of quons at the forward boundaries of the Earth's aether, were it not for the quons suffering annihilation along with an equal amount of continuum charge, with the energy being merged to create muon pairs which, as a secondary system, migrate through the Earth's aether in the reverse direction to transform back into quons and continuum charge where needed at the boundary where the lattice system separates.

The net inertial effect of this is then zero. One then sees that, by analogy with an optical effect named after Fresnel, we can expect this reverse flow to affect the speed of light through the primary structure. Fresnel's theory explains why the speed of light increases in proportion to $u(1-1/n^2)$ where u is the velocity of the disturbing medium and n is the applicable refractive index. This can be deduced from electron theory, but it has been verified by experiments in which the speed of light through moving water is measured.

Applying this same theory to the aether itself, and recognizing the counter displacement, it is an easy matter to arrive at the result observed experimentally by the famous Michelson-Morley observations.

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Let there be N like charges e per unit volume within an electrical continuum of uniform but opposite charge density σ. Then:

$$Ne = \sigma \quad \ldots\ldots (9.15)$$

Let N_1 and N_2 denote the population density in the primary structure (the quon system) and secondary structure (the muon counter flow), respectively. Then:

$$N = N_1 + N_2 \quad \ldots\ldots (9.16)$$

On the basis of electron theory the propagation velocity is proportional to $(N_0e^2/m)^{\frac{1}{2}}$, where there are N_0 charges e of mass m per unit volume, and the system has a resonant mode at frequency given by the angular velocity:

$$\omega^2 = 4\pi N_0e^2/m \quad \ldots\ldots (9.17)$$

By analogy with the properties of matter we know that the propagation velocity is given by $(P/\rho)^{\frac{1}{2}}$, where P is the pressure modulus of the medium and ρ its mass density and so this guides us to the formula:

$$c_1 = (P/N_1m)^{\frac{1}{2}} \quad \ldots\ldots (9.18)$$

for the speed of light c_1 set by the primary structure of the aether, where ρ becomes N_1m.

Let v denote the velocity of the primary structure (the quon system) and u the velocity of the secondary structure, the reverse flow of muons. The linear momentum of the aether has to be zero unless there is a build up of electric field. Hence:

$$vN_1 + uN_2 = 0 \quad \ldots\ldots (9.19)$$

Now refractive index n is the ratio of light speed in an active medium to that in the undisturbed vacuum state, the latter being denoted c. Hence:

$$n = c/c_1 \quad \ldots\ldots (9.20)$$

The speed of light in the frame of reference set by the quon system, the Earth's frame so far as our laboratory experiments are concerned, then becomes c as augmented by the Fresnel drag of $u(1-1/n^2)$ caused by the reverse flow of muons.

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From (9.18) and (9.20), n^2 becomes proportional to N_1, with P constant, so that, by using (9.14), n^2 is $1-N_2/N$ and $1-1/n^2$ is $-N_2/N_1$. We then see from (9.19) that $1-1/n^2$ becomes simply v/u. Thus the Fresnel drag in the vacuum, which is $u(1-1/n^2)$, is the velocity v of the primary structure, proving, from simple classical electron theory, that the speed of light will be referenced on the vacuum structure moving with the Earth, as was found by Michelson and Morley. That vacuum structure is the system of lattice charges, the quons, in the aether theory presented in this work.

The Numbers Game

I have founded this account of Creation on the task of deciphering the significance of the measured numerical values of certain dimensionless physical constants. In discovering the physical formulae by which these constants are determined it is found that there is very close agreement between what the theory indicates and what is actually observed. In this quest, however, it is a cause of very considerable anxiety to find that theory can, for example, bring one within, say, 0.1% of the measured value, when the estimated range of error in that measurement is somewhat less than this. One wonders if there is something that one has missed or whether there is an overriding factor such as a wave resonance that modifies the physical parameter involved.

Interested readers who study my published work and see how the theory evolved will notice many such situations, including the step that determined N as being necessarily an odd integer which was 1843 that value of N introduced in chapter 2, and I can but say that it would make this account of 'The Physics of Creation' far too long had I sought to include them all. One must also keep in mind that the techniques by which physical constants are measured can bring in their own uncertainties, apart from the range of error attributable to merging data from different

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measurements at different laboratories that are based on the same measurement method.

Furthermore, if one struggles to get the perfect fit between theory and experiment then one may be seen as 'cooking the books', as it were, when one is only exploring tentative hypotheses to see if one can discover the physics that underlie the true reason for the discrepancy.

By way of example, consider the two graviton forms discussed in Chapter 2, the τ-graviton and the g-graviton, as well as the quon or aether lattice particle introduced in that chapter by reference to the integer factor N of 1843 . When I first discovered the structure of the aether and published this in my 1960 booklet *'The Theory of Gravitation'*, I pictured the graviton as a minute element of charge occupying a spherical hole and moving in circles around the inner bounding surface of that hole to set up the electrodynamic interaction that accounted for the force of gravity. I had the concept of dynamic balance but had not been bold enough to see the graviton system as one having mass equal to that of its dynamic partners including matter. I was writing at a time when reference works indicated that the measured value of the fine-structure constant (α^{-1}) was 137.038 and not 137.0359, as now measured. I struggled a little in that work to make sense of the correction for the finite size of the aether lattice particle which put doubts on my theoretical quantification in the digits beyond 137.0. Only by the passage of time, six years to 1966, when I published a new edition of *'The Theory of Gravitation'*, was that lattice particle question resolved, but by then also I had the correct picture of the graviton, or rather the g-graviton form, which I saw as having a mass of some 5063 electron units. I derived that value of 5063 by theory (equation 5.19, pp. 76-79) of that work but at that time had no inkling that the tau-lepton would emerge in my later theory as a partner to the g-graviton. Indeed, since the tau-lepton

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had yet to be discovered at that time, it was bad enough having to predict the existence of an unknown particle, the graviton, of 5063 electron mass units (2.587 Gev), as a feature of my theory of gravitation.

On the question of whether the 2.587 GeV particle has ever revealed itself in high energy particle experiments, I did find reference to a so-called '(2585) bump' listed by the Particle Data Group on p. 314 of *'Physics Letters'*, **170B**, published in 1986. It was specified as 2586 +/- 45 MeV. I also found that there had been interest in Japan in the research of Hasegawa who had proposed the existence of a fundamental energy quantum with a rest mass two or three times as high as nucleon rest energy (the H-quantum) which a 1973 paper by Nanjo and Takana (*'Suppl. Prog. Theor. Phys.)* **54**, 120 said had a mass energy between 2.4 and 2.6 GeV.

As my theory of gravitation evolved, with its dependence upon gravitons of mass-energy 2.587 GeV, so I was ahead of the field in this regard, but it came as a massive boost to my theory when I read about the discovery of the tau-particle in 1979 and was able to show how its mass is derived theoretically in my book *'Physics Unified'*, page 121 (1980). Even so it was not until 1988 that I was able to publish papers revealing the role of the tau-particle as a graviton alongside the g-graviton, by virtue of their functional link as described in chapter 2 above.

The perplexing question that I will not attempt to answer is whether that link is a 100 per cent rigorous relationship by which the precise mass of one determines the precise mass of the other. Extraneous influence regulating the precise value of either quantity can affect the evaluation of G at the part per 10,000 level and I feel this is best left for future research consideration. I am mindful also that I have, in my writings (*Hadronic Journal*, **9**, 153-157; 1986) given reason for suggesting that the taon has a mass energy related to the proton by a ratio which is the cube

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root of 3 times the fourth root of 3. This may seem a curious contention but perhaps less so in the light of what has been said about hyperon creation at the end of chapter 4. One finds from this that the taon has a mass-energy of 1.8982 times 1836.152 times 0.511 MeV or 1.781 GeV, which is 3485 electron mass units.

This commentary on graviton mass values will give meaning to the numbers 3485 and 5063 as introduced in the section of text which follows, but I would just add a note here to say that in my published work there is mention of the 'super-graviton' which I suspect is generated in the presence of very concentrated elements of matter, typically a heavy atomic nucleus. The value of G must remain the same but to provide local dynamic balance for a very heavy element of mass the normal gravitons would need to get too close to one another and so, by their combination, I suggest they can cope with this situation in an interesting way. This phenomenon reveals itself in the field of 'warm superconductivity' where it appears that, when integer clusters of super-gravitons provide the dynamic balance for atoms or groups of atoms, the energy of electron flow is sustained by tapping the thermal energy of the atoms. See my paper entitled *'The Supergraviton and its Technological Connection'*, Speculations in Science and Technology, **12**, 179-186 (1989).

At another extreme, as I shall mention below in the next chapter THE EPILOGUE, it is conceivable that the energy activity affecting gravitons can be so intense in some parts of the universe that they cannot form in a quasi-stable form and so the virtual muons themselves have to stand in, as it were, and provide the dynamic balance that is associated with gravity. This can lead to an enormous escalation of the value of G, making stars centred in that activity exhibit an extremely high anomalous mass in no

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way commensurate with their inertial mass by the standards set within our solar system.

Hydrogen Creation by Graviton Decay

Here I wish to engage in a rather speculative digression. It is prompted by having received, when half way through the writing of this work, a rather unusual communication from a scientist named Dr. Paul Rowe. He claims to have found experimental evidence showing that, under certain circumstances, hydrogen can appear as if from nowhere and he sees this as sourced in the aether. He is also able to quote references to the earlier research of other scientists who have discovered the anomalous appearance of gas, presumably hydrogen, in their experiments. The common feature of these experiments is an electrical discharge or an explosive reaction in the presence of metal, aluminium or tungsten.

Now, it has been shown earlier in this work that, though the aether is not a system of rather elusive protons, it can, from its muon activity, create protons. Also we have seen that matter once formed by those protons combining with electrons can take up position in the E-frame of the aether and share its harmonious jitter motion. In so doing it puts the aether out-of-balance dynamically which is why the aether responds to provide the counterbalancing motion of a system of gravitons created in the G-frame, thereby giving rise to the force of gravity.

Upon consideration of Dr. Rowe's claim in the context of the theory governing proton creation, theory which we verified earlier by deriving the Hubble constant, one finds that it is impossible for protons to be created on demand by explosions or electric discharge, unless there are other factors needing consideration. Note that proton creation according to this author's theory arises only where there is energy present that is surplus to the equilibrium requirements of the aether. One cannot