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Einstein's Contribution to Relativity

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1. INTRODUCTION

If you mention 'Relativity', most people think of Albert Einstein and the famous mass-energy equivalence formula $E = mc^2$. (This will be particularly true for those people who have enjoyed the extremely funny Australian film **Young Einstein**). But other scientists contributed to relativity too. We could name at least: Newton, Poincaré, Lorentz and Minkowski. Our purpose here is to examine what Einstein in fact contributed to the subject, and to determine if his contribution deserves the credit it has been given, or indeed if it is correct.

Malcolm Bowden provided an informative article for **Ex Nihilo Technical Journal, vol. 2 (1986)**, entitled 'Suspect "Proof" of Relativity'. He invited others to take up the theme and develop it further. This material is partly a response to his invitation. However, I will have to say, with Malcolm Bowden, that much still remains to be done.

Our primary aim is to find the truth of the matter, not to discredit anybody. But neither do we want to accept any ideas if they are wrong. Intellectual integrity is at stake. We believe that truth is important for Truth's sake (John 14:6), and so with a spirit of humility we want to find the truth.

It is possible that those reading this, may realise that views expressed here are imperfect, and find they can improve on this analysis of the situation. I would very much like to encourage such endeavours.

Harald Nordenson gives a comprehensive review of the literature written about Einsteinian relativity.[1] But while there is an abundance of literature on Relativity, very few authors actually consider the derivation of the theory. With very few exceptions those who write about the Special Theory of Relativity (STR) have just accepted Einstein's fundamental statements.

> *'The foundation-stones of the theory have received notably little attention,'*[2]

Our Finding

To save you reading the whole article, we will give the result here. It seems that Albert Einstein contributed nothing positive to the subject at all, his contribution serving only to obscure the matter.

What? How can we say that? Surely it has been proved, by the atomic bomb for example, that $E = mc^2$!

Yes, $E = mc^2$ seems to be correct, as does the mass increase with velocity, as given by the Lorentz factor. It is our view that these are both real, acceptable, scientific facts (that is, they are consistent with all known observations, but like all scientific truths, are open to further refinement). But these were suggested by other people before Einstein. The credit has been given to Einstein because he proposed a theoretical derivation of them, from his Special Theory of Relativity (STR). But as we will show, there is just cause to seriously question the validity of this theory.

There are a number of advantages in stating the conclusion at the outset. The main advantage for the reader is that he will be alerted to read the material critically from the start, to test if it justifies the conclusion. The main advantage for the author with such a complex subject as this, is that he can thereby simply state certain judgments, which of course he will try to show are consistent with the observed facts, but without having to argue for their establishment.

In this case we propose that 'Relativity' has many aspects, which we must look at independently as far as possible, to determine which are correct and which are not. Rather than seeing 'Relativity' as a single monolithic unity, it seems to be helpful to see it as a collection of different pieces, of varying acceptability. This proposal will hopefully be substantiated by the arguments that follow.

Our Main Authorities

We have made use of material by six authors who are critical of various different aspects of STR. So this article is to a large extent a summary of their works. The authors, and their publications are:-

1. N. Rudakov, **Fiction Stranger Than Truth,** 1981.
2. H. Dingle, **Science at the Crossroads,** 1972.
3. L. Essen, **The STR, A Critical Analysis,** 1971.
4. L. Brillouin, **Relativity Re-examined,** 1970.
5. H. Nordenson, **Relativity, Time and Reality,** 1969.
6. C. L. Poor, **Gravitation versus Relativity,** 1922.

Note that they don't all come to the same conclusion as this author, but they are all critical of one or more aspects of the whole subject. And although they criticise

	1	2	3	4	5	6
Clock (or Twin) paradox	X	X	X		X	
Velocity mass increase	+		+			
Mass-energy equivalence	+		+			
Perihelion of Mercury	X			X	X	X
Deflection of light rays	X			X	X	X
Gravity-caused red-shift	X		X	X	X	X
Extended life of mesons	X	X	X			
Hafele's clock experiment	X					
Light postulate	X	X	X		X	
Length contraction	X				X	
Time dilation	X				X	
Curved space-time		X		X		
Misuse of mathematics	X	X		X		
Thought experiments	X		X			
Einstein's fundamentals	X				X	

Table 1. *A + in a cell indicates that the author speaks in favour of this aspect of relativity, an X indicates he speaks against it, and if the cell is empty he either says nothing or accepts current thinking without discussion.*

certain aspects of STR, they ALL endorse, or refrain from disputing both $E = mc^2$ and the mass increase. Their arguments are summarised in Table 1.

Overview

- We look carefully at the **Clock Paradox** (or Twin Paradox), which proves conclusively that all is not well with the STR.
- We critically examine the **experimental evidence** which has been given as confirmation of Relativity.
- We look at the result of the **Michelson Morley experiment**, Einstein's constant velocity postulate for light, and the question of the ether. Here Einstein seems to have made a serious mistake.
- We look critically at some of the **careless logic** used by Einstein and his followers (who include: Minkowski, von Laue and Eddington).
- Finally, we reach a **conclusion**, and suggest some parallels between Relativity and evolution.

At this point, non-physicists might like to skip straight to section 6, or perhaps skim through the intervening sections. We have attempted to explain each point fairly rigorously to the satisfaction of physicists.

2. THE CLOCK PARADOX

If two systems are moving relative to each other, Einstein's theory predicts that time will slow down. But the difficulty arises:- How can we say which system experiences time at a slower rate? Is a clock in A running slow relative to a clock in B, or the clock in B slow relative to the clock in A? We here need to backtrack somewhat.

Relativity actually began with Sir Isaac Newton. He found that there is no way, from kinetics, to distinguish between a stationary system, and a system moving with uniform velocity. Einstein accepted this truth, and thought he would extend it even further to include electrodynamic effects as well as kinetic effects.

So we should conclude that the effects will be reciprocal;[3] A is slow relative to B, and (at the same time) B is slow relative to A, because it is the relative velocity (according to the STR) that affects the experienced time. The clock paradox is extended by some promoters of Relativity, to the situation where two observers in two systems come together again and find that one member has aged more than the other observer. There was a TV program starring Peter Ustinov, which tried to explain some of the features of relativity in layman's terms. It told about a hypothetical space traveller who journeys out into space at high speed, and then returns at equally high speed to find that much more time has elapsed on Earth than he has experienced. In fact if the traveller had a twin brother who stayed on Earth, he would return to find his twin much older than himself. This is the amazing Twin Paradox. And the same difficulty exists. For example, since all is relative, who is to say that the twin on the earth should be

the one who is aging relative to the other? Why not the other way around, since 'spaceship earth' is leaving the rocketship in the same (relative) way? Can the paradox be resolved?

The Possible Answers

Those people who accept relativity are not unanimous in their answers to this clock paradox:

The majority believe that the travelling individual experiences the time dilation because he also experiences acceleration, but the problem can be cast in a form free of acceleration.[4,5] And anyway, if this is the case, Einstein has introduced an absolute means of determining rest or motion. In that case it should be Einstein's Principle of Absolutivity, instead of Relativity.

> *'In this case, symmetry no longer exists and the relativity postulate is not valid'*.[6]

Some believe that the effects are reciprocal, which is to say that both clocks run slow relative to the other.

> *'This is not only a logical contradiction, it is a physical impossibility'*.[7]

Professor H. Dingle poses the issue in its simplest form thus:

> *'What is it, on Einstein's theory, that determines which of two clocks, relatively moving uniformly, lags behind the other, as Einstein says. Dingle's contention is that to be true the theory demands that the clocks must work faster and slower at the same time! It is therefore untenable'*.[8]

The other possible answer that many people propose, especially those who are not familiar with the intricacies of STR, is that the effects are only apparent. There was an article contributed to **Physics Today** in 1971 along these lines by Sachs. **Physics Today** in 1972 printed 13 replies to Sachs, which amounted to labelling him as a heretic.[9]

Professor Dingle's Credentials

The establishment has implied that Herbert Dingle's understanding of the whole subject is somewhat lacking. He lists some of his credentials, which we have abbreviated here:

> *'To the best of my knowledge there is no one now living who can give objective evidence that he is more competent in the subject than I am . . . I have discussed the theory with practically all those physicists whose names are best known in connection with it — Einstein, Eddington, Tolman, Whittaker, Schrödinger, Born, Bridgman, to name but a few: I knew some of them intimately . . . When the volume on Einstein in **The Living Philosophers** was prepared, there were only two Englishmen among the twenty five contributors selected from the world; I was one: . . . When Einstein died I was summoned to broadcast a tribute to him on BBC television, which I did . . . There are two articles on the subject in the **Encyclopedia Britannica**, one by an American and the other by me'*.[10]

Thus, H. Dingle's credentials are impeccable. As a former devotee of 'Relativity', who has reluctantly come to see that it is fallacious, his views demand to be taken seriously.

So What is the Answer?

It is very easy for someone to say that the clock paradox has been answered. But we may legitimately ask, *'What is the answer?'* After 11 years of asking the question, H. Dingle has not been given an answer to his satisfaction, and his question is in a form that anybody should be able to see if an answer is relevant to the question. So we ask: What IS the answer?

H. Dingle is in no doubt about the implication, which he states thus:

> *'I can present the matter most briefly by saying that a proof that Einstein's special theory of relativity is false has been advanced; and ignored, evaded, suppressed and, indeed, treated in every possible way except that of answering it, by the whole scientific world (the world of physical science, that is)'*

Please reread this section if necessary to be fully convinced that there is a basic fallacy in Einstein's Special Theory of Relativity. Or, better still, carefully read H. Dingle's book. He is waiting for somebody to provide an answer to his simple question as stated above.

3. EXPERIMENTAL VERIFICATION OF RELATIVITY

There is a considerable body of scientific observational evidence, which is said to verify STR. Here we examine all this evidence critically, and try to determine rationally if the case has been proven.

Malcolm Bowden has dealt with the findings of C. L. Poor **Gravitation versus Relativity** in his article **Suspect 'Proof' of Relativity**.[12] There is no need to repeat his material here. Suffice it to say that Poor has shown that neither the precession of Mercury's orbit nor the observed deflection of light from stars can be said to verify Einsteinian relativity.

Mass increase with velocity

> *'That a moving electron experiences a mass increase when accelerated was empirically established before Einstein wrote his 1905 paper On the Electrodynamics of Moving Bodies. Kaufmann conducted experiments with cathode rays since 1901 and demonstrated that the relationship between the charge and the mass of an electron is subject to change and that the change depends on velocity. Abraham arrived at the same conclusion in 1903. He attempted to provide a theoretical basis for mass change. Lorentz in 1904, modified Abraham's theory and suggested that the*

total mass of an electron equals the rest mass divided by the Lorentz factor. It is this Lorentz formula which was later confirmed by further tests and which is accepted by elementary particle physicists today.'[13]

The Lorentz factor is defined as the square root of one minus v squared over c squared. So we can express the mass increase symbolically as:

$$m' = \frac{m}{(1-\frac{v^2}{c^2})^{\frac{1}{2}}}$$

This formulation cannot be attributed to Einstein. It seems he didn't know what he should do about mass. In his 1905 paper on STR **On the Electrodynamics of Moving Bodies**, he says[14] that:

'Longitudinal mass = m over the Lorentz factor cubed, Transverse mass = m over the Lorentz factor squared.'

So the mass increase hypothesis appears to be true, but it was not formulated by Einstein.

Mass-energy equivalence ($E = mc^2$)

There certainly is a conversion possible from mass to energy, which seems to be dictated by the relationship $E = mc^2$. But the credit for this equivalence should not go to Einstein:

'That the mass increase or the total mass of a particle may be equivalent to energy in accordance with a formula which has the configuration $E = mc^2$, or a very similar configuration containing the square of the velocity of light, was proposed by Poincaré, Hasenöhrl and others before Einstein . . . Although it is assumed that the formula is theoretically valid, no conclusive proof has been provided in practice.'[15]

'It is not a correctly deduced formula. It is a mere guess and as such wholly independent of the Theory of Relativity .'[16]

'The mass-energy equivalence can be mathematically derived from the mass increase, and the mass increase from the mass-energy equivalence.'[17]

The perihelion of Mercury

The elliptical orbit of Mercury is not fixed in space, but rotates slowly about the focus at the sun. It has been claimed that this provides proof of relativity, but

'An apparently good check was proven largely accidental by Dicke'.[18]

'The advance of the perihelion of Mercury (43 seconds per century) was hailed as a wonderful check with a theoretical prediction of 42.6 sec, but here again let us refer to Chazy who found a number of other examples in the solar system where Einstein's predictions conflict with experiments. It is hard to believe seriously in a coincidence of less than one second for Mercury, while so many other examples give large errors and even opposite signs! Let us here candidly admit that there must be many other unknown factors involved. The computations of Chazy refer to the motions of perihelions of four planets and similar motions for a number of satellites orbiting around planets (e.g. the moon). Errors of at least five seconds per century seem to be the inevitable limit in these very difficult computations. Einstein's theory yields about 1/6 of the advance of perihelion of Mars and practically nothing for Venus. Let us add that Dicke's discovery of the oblate shape of the sun leads to perturbations that definitely destroy the agreement about Mercury. The question cannot be considered completely settled.'[19]

Deflection of light from stars

Einstein predicted that light rays passing near the sun would be deflected by gravity, and that this phenomenon should be observed during solar eclipses. Some experiments were done and were alleged to verify relativity.

'These were very inaccurate experiments with individual errors of 100% and averaged errors of 30%. The theory is not safe because it assumes an ideal vacuum near the sun's surface, while we can observe very powerful explosions of matter and radiation from the sun.'[20]

'For example, Einstein predicts the deflection of a light ray passing near the surface of the sun, but we obtain a similar result if we consider a light ray as a beam of photons hv with masses hv/c^2. Only the numerical coefficient is different, and Einstein's prediction is twice as large as that in the computation with photons. Here the experimental results are actually very poor with errors of 100% magnitude . . ., looking candidly at these observations, one feels that very large sources of error are obviously playing a substantial role, and our present knowledge of the turbulent flow in the solar atmosphere yields the most probable explanation. The Shapiro experiment is certainly safer than the deflection of light rays.'[21]

Gravity cause of red-shifts

Relativity was also claimed to predict a gravity induced red-shift of the light spectrum. R. V. Pound carried out an experiment using an incredibly accurate frequency standard.

'He wanted to check one of the predictions of Einstein's general relativity, the so-called gravity red-shift. This effect was verified with an accuracy of 1% for the very small variation of gravity from the bottom to the top of a tower only 22 meters high, and this success was hailed as a wonderful check of Einstein's theory.'[22]

But,

'The Pound experiments brilliantly prove the result with 1% accuracy, but a very simple reasoning, using the mass hv/c^2 of a photon, is enough to make the prediction.'[23]

Extended life of mu-Mesons

It has been noted by particle physicists that mesons have a greatly extended life when travelling at high speeds, and this is widely hailed as a verification of relativity.[24] But not everyone agrees:

L. Essen states that the meson data

'is an important result, but it cannot be regarded as a confirmation of relativity theory, although it could perhaps be taken to support the theory of Lorentz.'[25]

H. Dingle suggests that there is circular reasoning involved in the meson data,[26] but also says:

'Despite mu-mesons and their kind, I think asymmetrical ageing extremely unlikely, but that is an opinion; the falsity of the special relativity theory I regard as proved.'[27]

And N. Rudakov concludes:

'If the relativistic interpretation of the meson observations is wrong, what other suggestions are there to explain the behaviour of the particles? The simplest and most probable explanation is that the higher the energy of the mesons the greater their kinetic mass and the deeper the penetration of the atmosphere.'[28]

Hafele's Moving Clocks

The Hafele-Keating experiment is frequently quoted as direct evidence of Einsteinian time dilation.

'It is based on the carriage of atomic clocks in aeroplanes around the Earth and a comparison of their readings with a reference clock on the surface of the Earth. Hafele and Keating have come up with results which are supposed to fit well with the predictions of Einstein, but when the details of their procedure, and all assumptions on which it is based, are closely examined, it is at once evident that there cannot possibly be any connection between their results and the theory of special relativity.'[29]

Some of N. Rudakov's reasons are as follows:

'Einstein's moving clocks are permitted only to go slow. Hafele's clocks go slow as well as fast. This cannot be in harmony with relativity theory.' . . . 'The set-up implies that a point on the moving surface of the Earth where the reference clock is located is one of the two systems of an Einsteinian doublet ... A point on the terrestrial surface is not sufficiently isolated from any other point on it, it has its own motion in relation to the centre of the Earth, and its motion is circular and not rectilinear.'[30]

Summary of the Experimental Results

In summary then, the experimental observations seem to verify the mass increase hypothesis which is strictly not part of the STR; and otherwise fail to verify Einstein's theory.

In the case of the meson data, support may be given to the Lorentzian theory in which there is an absolute frame of reference, but apparently not to Einstein's STR where no absolute reference frame exists. However as conflicting interpretations have been offered for the meson data, we must leave the correct interpretation of the evidence open to further investigation. But it certainly seems to be irrelevant to STR.

4. MICHELSON-MORLEY EXPERIMENT

'In 1887, Michelson and Morley performed an experiment to find out whether the source-light motion was in accordance with the prevailing mechanical assumptions.'[31] Their apparatus was as shown (see Figure 1).

A light ray from light source L meets a plate of glass at 45° in the point O. It is partly reflected in O to the mirror S_1. Part of the ray passes through P and continues to the mirror S_2. Both mirrors S_1 and S_2 are at the same distance l from O. Reflected at S_1 and S_2 the rays return to O and the ray from S_1 goes partly through P and continues to F. Both rays thus meet on the line PF and are observed in a tube in F. On their way from O to F the rays will interfere with each other, and the observer in F will see an interference band in the tube.

If the whole is at rest in a system where the light rays are presumed to propagate uniformly and with constant velocity in all directions, i.e. at rest in the ether, both rays will travel the same distance from the glass plate to the mirror S_1 and S_2 and back. If we then turn the whole 90° the distances the rays will have to travel will still be alike and there would therefore be no change in the interference band. If on the other hand the setup moves in relation to the ether in the direction F–S_2 and we then turn the setup 90°, the rays will travel different distances on their ways O–S_1–O and O–S_2–O and this would result in a displacement of the interference band, which would be observed in F.[32]

'No such change has, however, ever been observed in any of the many experiments performed. The Michelson-Morley experiment has always given negative result.'[33]

The Ether

'What Michelson and Morley did obtain was a null result for the motion of an ether with respect to the Earth. What they did not obtain was any result enabling one to distinguish between the at least three remaining logical alternatives:

1 there is no ether

2 the ether moves with or is attached to the Earth

3 the ether, much like a viscous fluid, attaches to whatever body it contacts and is thus entrained or "dragged along" with the Earth.

Many physicists consider the annually varying aberration of fixed stars perpendicular to the Earth's orbit which was reported by Bradley in 1728 to be evidence that the ether is not entrained by the Earth; thus

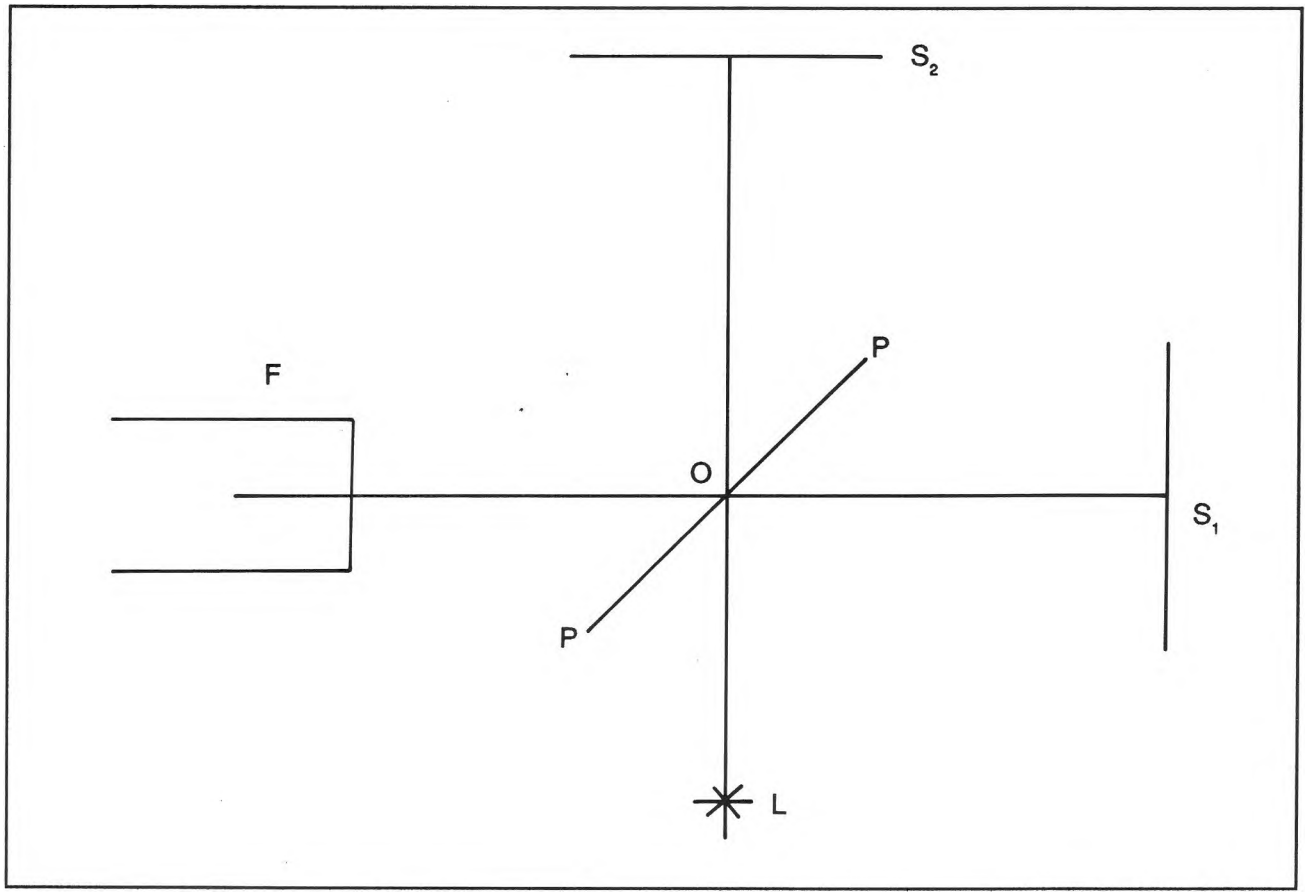

Figure 1. *The apparatus used by Michelson and Morley for their famous' experiment. (The symbols are explained in the text.)*

eliminating alternative (3) but not necessarily (2) . . . What is rarely mentioned is why alternative (2) was rejected by most physicists: because it implies that the Earth has a very distinctive place within the cosmos. This latter notion is inseparably linked to the question of origins.'[34]

One of our authorities makes this exact mistake:

'Another explanation is given by the assumption that the experimental set-up is always resting in the ether. A turn of the set-up 90° would not have any influence. This is, however, very improbable, as it would mean that the ether would always follow the celestial movement of the earth.'[35]

Today the idea of the ether has been rejected mainly because of Einstein's rejection of it. But as H. Dingle points out the matter is far from settled:

'If the postulate of relativity is wrong, then there is a Lorentzian ether and asymmetrical ageing is possible.'[36]

We note in passing that H. Poincaré also accepted an ether,[37] and an absolute frame of reference,[38] although by Newton's law of relativity it is not possible to determine our velocity relative to this absolute reference frame.

Even de Broglie writing in **Physics Bulletin** in 1971 says:

'Everything becomes clear if the idea that particles always have a position in space through time is brought back. The movement of the particle is assumed to be the superposition of a regular movement . . . and of a Brownian movement due to random energy exchanges which take place between the wave and a hidden medium, which acts as a subquantum thermostat.'

And Aspden comments,

'Now, if de Broglie has to appeal to a hidden medium which exchanges energy with matter, and this in 1971, is not there purpose in reviving the aether with real fervour?'[39]

Lorentz's Explanation

In 1904, Lorentz proposed a theory which would explain the null result of the Michelson-Morley experiment. He proposed that motion through the ether would

'effect a shortening in the direction of motion in the proportion of 1 to $(1 - v^2/c^2)^{½}$ *'*[40]

as well as a slowing down of all rhythmical processes.[41]

'Fitzgerald-Lorentz theory suggested a body undergoes a contraction in the direction of its motion in

relation to the ether. But as Bergson and Broad have pointed out this necessarily implies also a "dilation of the second".'[42]

Einstein's constant velocity postulate

Einstein postulated in his 1905 paper on STR[43] that the velocity of light will always be observed to be the same irrespective of the system of reference. And he considered that the Michelson-Morley result was confirmation of this postulate.

'Von Laue is more direct. He declares[44] *that it has been established through the Michelson-Morley experiment . . . that the propagation of light in all Galilean systems is in all directions uniform. As this implies a contradiction — also admitted by Einstein — we find that the conclusion drawn from the Michelson-Morley experiment is that a contradiction is supposed to have been proved or made highly probable. To this I wish to declare categorically: It is appalling that it should be necessary to call attention to the indisputable and irrefutable fact that: No experiment in the world could ever prove or make "highly probable" the correctness and validity of a proposition which is in itself or directly implies a contradiction.'*[45]

H. Nordenson was not the first to point this out:

'H. E. Ives was very critical of the theory of relativity and regarded the principle of the constancy of the velocity of light as a paradox.'[46]

It was then necessary for Einstein to introduce new length and time concepts to try to remove this contradiction which he had introduced.

'No explanation of the Michelson-Morley experiment has therefore been offered by the Theory of Relativity.'[47]

That a contradiction is implied is evident as follows:

If a light ray is supposed to travel with velocity c in two systems K and K' moving relatively at velocity v, we imply

'that at a certain moment it would be both in one point on the x-axis at the distance ct from O and also in a point on the x-axis at the same distance ct counted from O', which means that the ray should at a certain moment be in two points . . . This is a clear contradiction which must be eliminated.'[48] (See Figure 2.)

In conclusion:

'If we cannot offer an explanation free of contradictions and covering all the results attained by different

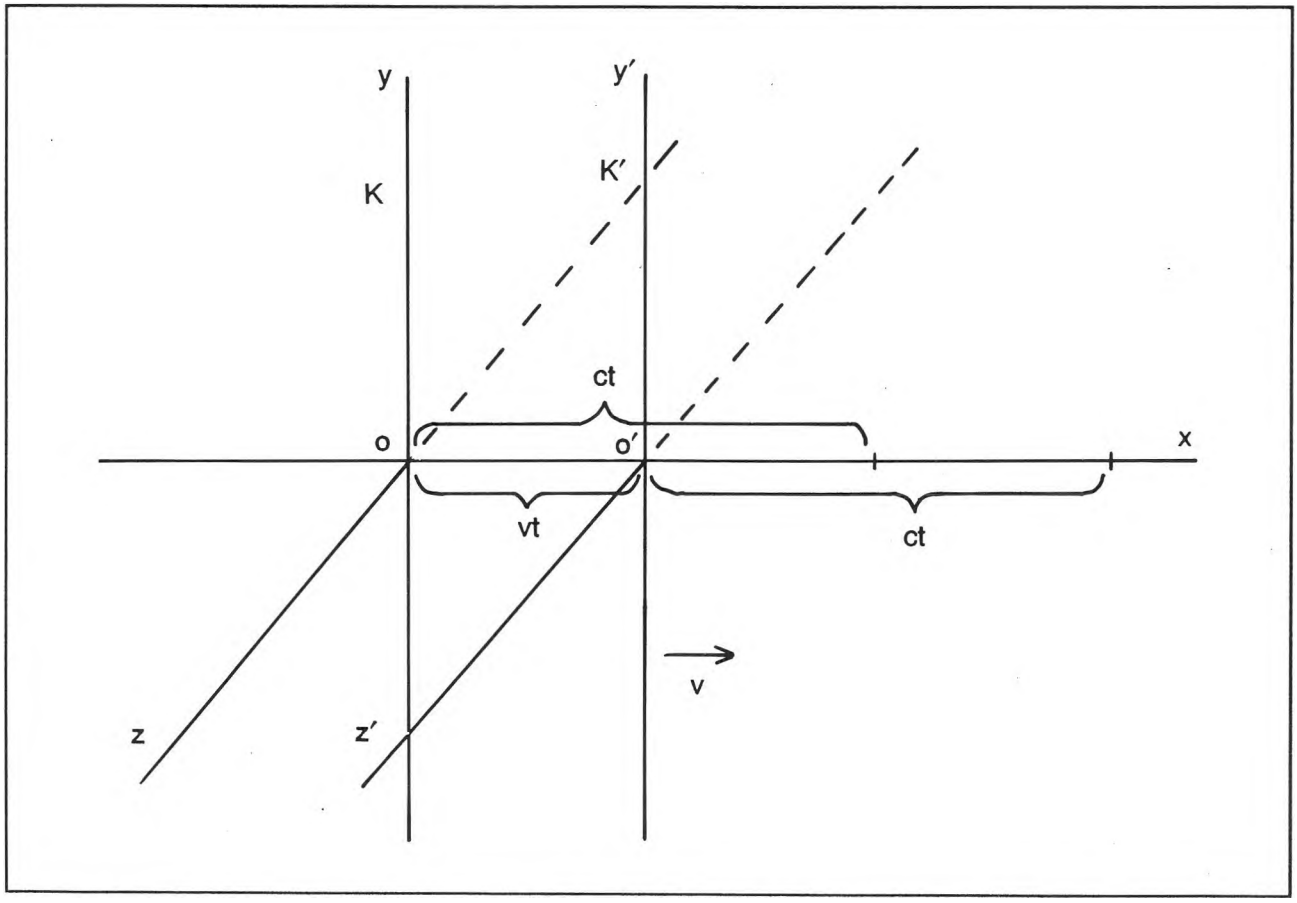

Figure 2. *The system of reference which illustrates the contradiction introduced by Einstein. (The symbols are explained in the text.)*

light-phenomena, we must confine ourselves to the humbler statement that our present knowledge of the nature of light is so incomplete that we have so far not been able to form a theory which covers all the facts hitherto observed.'[49]

5. PSEUDO LOGIC

In this section we question some of the reasoning used by Einstein (and others) in establishing Einstein's theories of relativity. Note that 1919 was a significant year. It was only then that Lorentz's theory of relativity gave way to Einstein's theory of relativity.[50]

Einstein's rejection of simultaneity

In his authoritative 1905 paper on STR, Einstein sets up conditions for simultaneity:[51]

$$t_B - t_A = t'_A - t_B$$

He then proves that with moving reference frames it is impossible to achieve this condition.[52] Instead he arrives at:

$$t_B - t_A = \frac{r_{AB}}{(c-v)} \qquad \text{and} \qquad t'_A - t_B = \frac{r_{AB}}{(c+v)}$$

However Nordenson shows that Einstein has violated his own rules. By using formulae which Einstein presents later,[53] he shows that the required condition of simultaneity can be met. He says

'we come to results ... in full accordance with the classical view.'[54]

Einstein's rejection of classical time

'According to the classical view the time of an event in a system K' in arbitrary motion in relation to a system K is identical with the time of the event as judged from the system K, considered at rest. This, which can be expressed by the transformation equation t'=t, is in fact the basis of all classical laws of physics and all our previously acquired results.'[55]

'The essential core of Newton's concept of time is the constant, uniform and imperturbable time-flow, a well founded and generally accepted assumption indispensable to physics. The rejection of this assumption is regarded as Einstein's greatest "achievement". Einstein formally endorses only the measurement of time, not time as such, and he postulates a synchronical time measurement sequence only within a system based on an inertial reference frame. Another system, also based on an inertial reference frame and in relative motion to the first, has, according to Einstein, a different time measurement sequence. There is no universal time.'[56]

Eddington (one of Einstein's followers) has written:

'The whole foundation of the idea of world-wide instants was destroyed 250 years ago and it seems strange that it should still survive in current physics.'[57]

H. Nordenson points out that Eddington's comments are incorrect: that instantaneous signals are not essential to the classical view of time; and so Einstein's ideas are not a natural consequence of Romer's speed of light results of 1675.[58]

'It is very important to realise that Einstein mostly tacitly, but nevertheless quite definitely, denies the oneness and wholeness of the universe in the Newtonian sense.'[59]

'Einstein presupposes what should be properly called a "multi-verse", a universe with a split personality, and split in as many ways as one cares to imagine.'[60]

Einstein's view of reality would therefore appear to be at odds with the biblical concept of a UNI-verse which reflects the unity of its Creator; and throughout which we suspect that universal time reigns:

'Do we really live in a world of makebelief? Time is one of the most basic sense references we have for understanding our environment and as a basic reference its constancy ought really to be taken as "timeless". It is so fundamental.'[61]

Mathematical treatment of Space-Time

'It is to Minkowski that we owe the idea of "space-time" as an objective reality — which is perhaps the chief agent in the transformation of the whole subject from the ground of intelligible physics into the heaven (or hell) of metaphysics, where it has become, instead of an object for intelligent inquiry, an idol to be blindly worshipped.'[62]

H. Minkowski effected this transformation with one sentence:

'Henceforth space by itself, and time by itself, are doomed to fade away into mere shadows, and only a kind of union of the two will preserve an independent reality.'[63]

'Two monumental theories were introduced in physics around 1900: Planck's quantum theory and Einstein's relativity theories. Now that sixty years have elapsed, we may compare their impacts on scientific thinking. Quantum theory is fundamental but constantly changing; its ideas are being subtly refined and readjusted almost every year to account for millions of new experimental results ... Relativity was built by Einstein into a most logical and rigid frame; special relativity was an enormous success, especially with the energy-mass relation. General relativity first seemed to be verified in three different types of experiments, of which two are seriously in doubt currently while the last one (red-shift) checks very well with the latest experiments but can be explained by a much simpler theory. So we have to raise the question: General relativity is a splendid

piece of mathematics, but what about its physical reality?'[64]

The contrast L. Brillouin makes here between Planck's and Einstein's contributions to science seems to me to be very significant.

Aspden talks about

'those scientists of our time who are happy with life as a matrix of mathematical equations in a void.'[65]

'As a conclusion: There is no experimental check to support the very heavy mathematical structure of Einstein. All we find is another heavy structure of purely mathematical extensions, complements, or modifications without any more experimental evidence. To put it candidly, science fiction about cosmology — very interesting but hypothetical. Altogether we have no proof of the need for a curved universe (space plus time) and the physical meaning of this theory is very confusing.'[66]

Imaginary physical experiments

'Perhaps the strangest feature of all, and the most unfortunate to the development of science, is the use of the thought-experiment. The expression itself is a contradiction in terms, since an experiment is a search for new knowledge that cannot be confirmed, although it might be predicted, by a process of logical thought. A thought-experiment on the other hand cannot provide new knowledge.'[67]

N. Rudakov points out:

'The word "experiment" alone is able to lead people astray who are not aware that a thought experiment is really all thought and no experiment.'[68]

Einsteinian Fundamentals

Einstein rejected classical space and time. But it seems he provided nothing in their place. The only certain thing in his view of the universe is the speed of light, but it is a derived unit (distance over time). So it is difficult to see what fundamentals exist in Einstein's universe.

'Einstein so often — although surely unconsciously — half way through his reasoning neglects his own premises and their necessary consequences and falls back on classical modes of reasoning which he has rejected a moment before.'[69]

'However, nothing will be achieved by rejecting Newton because Einstein does not offer a complete, clear and consistent set of presuppositions.'[70]

6. CONCLUSION

The Two Postulates of Relativity.

Einstein's Special Theory of Relativity was reasoned from two postulates:

1 The relativity postulate, and

2 The constant velocity (of light) postulate.[71]

Professor H. Dingle's reasoning concerning the clock paradox makes the relativity postulate appear very uncertain, and if the meson data is correct, this postulate has to be rejected. The fact that the constant velocity postulate implies a contradiction, as pointed out by Nordenson, means that it must certainly be rejected. Thus we find Einstein's Special Theory of Relativity completely unacceptable.

As we said at the outset, it seems that conclusions established before Einstein entered the field may be correct, but material added by Einstein and his followers is wrong, or highly questionable.

Then What is Left?

We believe Newton's absolutes of space and time should be taken as true, but a correction made to the value of a body's mass as a result of its velocity. If so, it means that all high-school physics holds because the required velocity corrections to mass are negligible, only becoming significant as the velocity becomes an appreciable fraction of c. As for the well known mass-energy equivalence formula, it is expected to be correct, not only because of the atomic bomb, but because it can be obtained from the mass increase formulation based on the Lorentz factor. This was the situation before 1905 when Einstein entered the field.

Einstein's Brilliance

Although we are critical here of Albert Einstein's contribution to Relativity, we in no way want to detract from his great intellectual ability, his capacity for creative thought, nor his contribution to science in other ways. He was awarded the Prize for Physics of the year 1921

'for his merits in mathematical physics, especially for his discovery of the law of photo-electric effect'

(but not for his theory of Relativity, as many people believe). Even if we omit his work on relativity,

'he will stand out as one of the great scientists of our time.'[72]

Among his other work, he contributed to quantum mechanics; and he did work on the Brownian movement, on thermodynamical properties of a system of particles with symmetrical wave functions (known as Einstein-Bose statistics).[73]

In fact, we should try to find some explanation of how such a brilliant man could be so wrong with his total view of the physical universe. It is at least possible that he deliberately set out to reject the classical time concept: Einstein's closest friend of his young days in Zurich was Michele Besso. In a last letter to Besso's sister and son, Einstein wrote:

'Michele has left this strange world just before me. This is of no importance. For us convinced physicists the distinction between past, present and future is an illusion, although a persistent one.'[74]

Is it true that time is an illusion? No! It is just as real as all the rest of this creation. Perhaps Einstein thought he could design his own time concept to suit himself.

Lyell **— Geology** **— 1833**	**According to the Bible, the fossils and the geological strata testify to the world-wide, Earth-changing flood in the days of Noah, as described in Genesis chapters 6 – 8 (2 Peter 3:5). Sir Charles Lyell proposed an alternative explanation in his book, *'Principles of Geology being an attempt to explain the former changes in the Earth's surface by reference to causes now in action'.***
Darwin **— Biology** **— 1859**	**The Bible is insistent that living things reproduce *'Each according to its kind'* (Genesis 1:11 etc.). Charles Darwin proposed an alternative view that they can undergo unlimited change, as they reproduce over many generations.**
Cantor **— Maths** **— 1895**	**For hundreds of years it had been considered that the justification for mathematics lay in the fact that God had created Man to exercise dominion over the creation (Genesis 1:26 and Psalm 8:6). Georg Cantor attempted to establish another basis for mathematics (see article in Ex Nihilo Technical Journal, vol. 3).**
Einstein **— Physics** **— 1905**	**The Bible implies that TIME is a part of God's creation (Genesis 1:1) which flows uniformly and irreversibly towards the conclusion of history; and that each person, at the time he departs this life will face a judgment (Hebrews 9:27). We suggest that Albert Einstein tried to replace this with a more comfortable time concept.**

Table 1. *Comparison of the influences of various scientists, influences which have resulted in people finding excuses to reject the Bible, and the God of the Bible.*

Relevance to Creation/Evolution

N. Rudakov points out a relationship, although he is not a creationist:

> *'Relativity cannot be considered neutral in relation to religion and ethics. Once science was the handmaiden of theology, to-day the position is reversed . . . Where science and theology meet or overlap the scientists retain the upper hand, even when they are clearly departing from scientific methods and engage in subjective speculation and authoritarianism . . . The relativising effect of the theory on religion and ethics was recognised by some church leaders already in the 1920's . . . Cardinal O'Connell of Boston told a group of Catholics in 1929 that relativity theory "cloaked the ghastly apparition of atheism" and produced "universal doubt about God and his creation*".'[75]

H. Dingle too, makes mention of revelation as a basis for Relativity:

> '*. . . anyone who took [the criticism of relativity contained in this book] seriously would make himself ridiculous. I have met none willing to face that indignity merely because he cannot find fault in what he knows by supernatural revelation (though he would not call it such, yet would be at a loss to find an alternative name for its source) must nevertheless be faulty.*'[76]

This is rather a convoluted statement, but he is saying that many people today 'know' that Relativity is right without having any rational basis for that certainty. The only explanation he can find is that it comes from a 'religious' conviction.

Y. P. Terletskii[77] seems to revel in the contradictions of relativity and has gone further than most others in exploring the implications of Einstein's theories. He questions the principle of causality, and considers the possibility of transmissions faster than c. He claims this as a source of negentropy, and so it ties in with the creation-evolution question.

The basic matter is perhaps this: Charles Darwin, as we know, had a major influence in tinning people's thinking away from biblical absolutes, in the subject of biology; which has resulted in people finding an excuse to reject the Bible, and the God of the Bible. But other people have had rather similar influence (albeit to a lesser extent) in other fields (see Table 1).

In every case, the biblical truths which have been challenged are found in the book of Genesis.

To be sure, mathematics and physics have not been affected to the same extent that geology and biology have. There, the beginning student even, is confronted with overwhelming anti-biblical concepts. Mathematics and physics, however, only touch on the ideas of Cantor and Einstein respectively, when the student reaches an advanced level. Nevertheless, the Christian student would do well to be warned of the religious nature of the biases which Einstein and Cantor have contributed to their disciplines.

Further Work

There is a wealth of material, in addition to what we have summarised here, in the books by: Dingle, Nordenson and Rudakov.

It would seem that physicists have to discard the erroneous concepts that have been generally believed since early this century, and reconsider the ideas that were being discussed at that time. **Progress in physics may, indeed, require the physicist to backtrack in his ideas.**[78] Einstein has merely served to confuse the picture, so there are many questions left unanswered:

- Is asymmetrical time dilation a real phenomenon?
- Can it be proved that $E = mc^2$ etc.?
- Is there some more basic principle from which it can be shown that mass is essentially a manifestation of energy in motion?
- Is Aspden right in his attempt to **explain mass as a property of electric charge in motion through space**?[79]
- Does an ether exist? If so, is it flexible and turbulent as envisaged by Aspden, or rigid as envisaged by Lorentz?[80]

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