

EINSTEIN'S TERRIBLE TWINS

and Other Tales of Relativistic Woe

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Dedicated to Dayton Miller

Abstract

Einstein's Special Relativity is based on two fundamental assumptions, the so-called Einstein postulates. The 'constant speed of light' postulate predicts that two inertial observers – for instance twins in spaceships free-floating in outer space – will each see the other's clock running slower than his own. The 'no absolute at-rest' postulate says that both perceptions are equally valid. The logical incoherence of this makes a nonsense of the postulates, and by extension of Special Relativity itself. The positive 1887 Michelson-Morley result confirms this, falsifying both postulates. In spite of which, more than a century later Special Relativity is still an official scientific doctrine, and its creator Albert Einstein is a scientific genius. The first part of the article looks at the technical aspects of Relativity. The second discusses the historical, political, social and personal factors that led up to the present situation. The approach is conceptual and 98% non-mathematical.

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INTRODUCTION

General

As most of us know, the Theory of Relativity is one of humanity's most outstanding intellectual achievements and its creator Albert Einstein was an all-time scientific genius. For most of my life I accepted unquestioningly this piece of conventional wisdom. Till one day, somewhat unwittingly, I was led to question it. The following article is the result. It comprises:

- 1) Special Relativity, in simple non-mathematical terms
- 2) the basics of General Relativity
- 3) Einstein as a person
- 4) the social and political background

Readers not interested in the technical aspects can skip to item 3) on p.36 with little loss of continuity. Companion articles¹ look at the related topics of the aether and space-time.

To leave the main body of the text as uncluttered as possible, cross-references and 'asides' are placed in footnotes. The end-notes contain source references only. In the Internet case they comprise the main site name and year and month of access.

Contrary to custom, quotations are in general not *de rigueur*, but may be abridged or combined with others from the same source^a. Their meaning is however never consciously distorted.

The English language in its wisdom not providing a non-gender-specific pronoun, for "he", etc. in general read "he/she" etc.

Thanks are due principally to Barry Cavell and Stan Heshka, who read the original text and made many useful comments, most of which got incorporated. Also to Arthur Mather and Nick Landell-Mills who likewise gave valuable feedback.

^a Verbatim quotes are tagged "sic".

MOTIONS

Inertial motion

Einstein created two Theories of Relativity. Special Relativity was published in 1905. General Relativity came ten years later in 1915.

General Relativity is highly mathematical and complex, to the extent that Einstein once said that only twelve people in the world really understood it². Special Relativity, on the other hand, is in principle very simple, and requires at the most high school algebra.

The "special" of Special Relativity is due to its restriction to so-called *inertial conditions* where motion is at steady speed in a straight line, with no acceleration or rotation:

inertial motion = at steady speed in a straight line

Because *gravity* is an acceleration – when one drops an object it accelerates towards the centre of the Earth – there can also be no effects of gravity.

A train travelling at steady speed along a straight level section of track moves inertially^a, Fig. 1a. One can walk around in it as if it was stationary. But when it suddenly brakes, or goes round a sharp bend, one cannot.

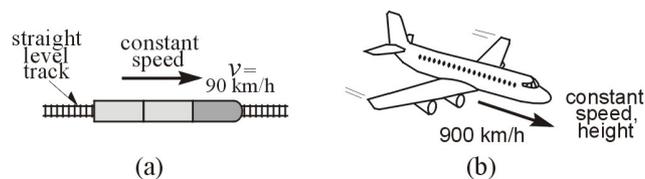


Fig. 1. Inertial motion.

The same holds for an airplane cruising at constant speed and height, Fig. 1b. One can walk around in it as if it was on the ground. But when the plane accelerates during takeoff, or brakes during landing, one cannot.

Special Relativity formalizes these relations by saying that:

the laws of mechanics, are the same for all inertial observers:

The result of a mechanical measurement, for instance the time it takes for a dropped object to reach the ground, is the same in any inertial system, independently of whether it is carried out on the ground; or in a train moving at a steady speed of 90 km/h; or in a plane cruising at 900 km/h.

Relative motion

The other 'motion' we need to look at is *relative motion*. Noting that the term 'relative' is redundant, since *all* motion is by nature relative. Einstein wrote:

"It has of course been known since the days of the ancient Greeks that in order to describe the movement of a body, a second body is needed to which the movement of the first is referred."³

So when we talked of a train travelling at a steady speed of 90 km/h, that was strictly meaningless, because we didn't specify *with respect to what* the train's speed was measured.

In such cases, however, we evidently imply a *local default reference*, in this case the Earth's surface. With respect to a fixed object on the local Earth's surface – for instance the last station the train passed – it moves at a steady speed of 90 km/h, Fig. 2.

^a Gravity here acts perpendicularly to the motion and has no effect.

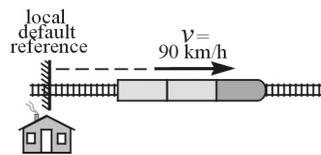


Fig. 2. 'Absolute' motion.

We will call such speeds 'absolute'. The single quotes mean that they are measured with respect to a local reference chosen for convenience, and not to some overall cosmic reference, should there be such a thing.

Consider two trains 'A' and 'B' travelling inertially along parallel sections of track at 'absolute' speeds of 90 km/h and 110 km/h respectively, Fig. 3a. Relative to train A, train B moves forward at 20 km/h, Fig. 3b. Relative to train B, train A moves backwards at the same speed, Fig. 3c.

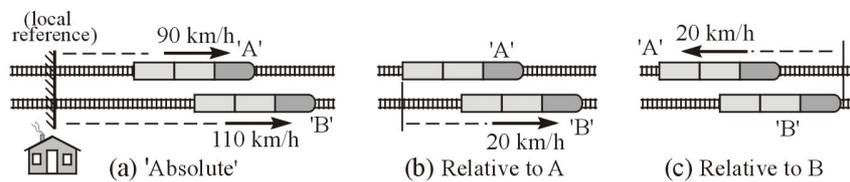


Fig. 3. Trains,

The directions of the two relative velocities^a are opposite. But their magnitudes are the same, in this case 20 km/h. For two bodies there is only one relative speed. The speed of A relative to B is inherently equal to that of B relative to A.

Now consider a similar situation, but with two spaceships free-floating in outer space^b. To make the numbers more realistic, the speeds have been multiplied by one thousand.

With respect to planet Earth, the 'absolute' speeds of the spaceships are 90k^c and 110k km/h respectively, Fig. 4a. Relative to spaceship A, spaceship B moves away from the Earth at 20k km/h, Fig. 4b. Relative to spaceship B, spaceship A moves towards the Earth at the same speed, Fig. 4c.

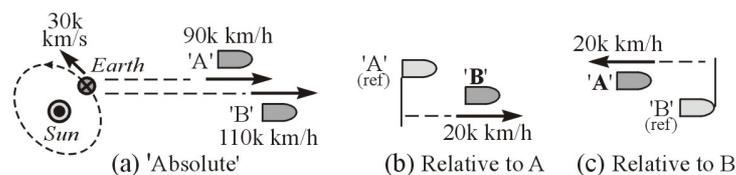


Fig. 4. Spaceships (1).

In this case the Earth is however not a convenient reference, because it orbits the Sun at 30 km/s. Neither is the Sun itself, which moves at an even higher speed of ~250 km/s around the centre of the Milky Way galaxy⁴.

In such situations only *relative speeds* are effectively meaningful. The most we can reasonably say is that relative to spaceship A, spaceship B moves at a certain speed in a certain direction, Fig. 5a. And that relative to spaceship B, spaceship A moves at the

^a 'Velocities' are vectors with both magnitude and direction. 'Speeds' are their magnitudes.

^b The definition of 'outer', or 'deep' space. For the spaceships to be moving inertially, their engines must be switched off.

^c "k" = 1000.

same speed in the opposite direction, Fig. 5b. The word "stationary" is here for practical purposes meaningless, Fig. 5c.

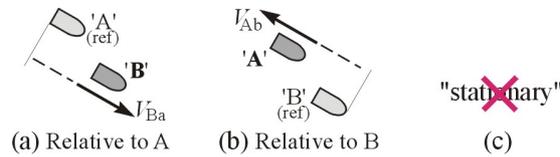


Fig. 5. Spaceships (2).

SPECIAL RELATIVITY

Galileo

A confusing aspect of the term 'relativity' is that it is used in two distinct senses. Galileo^a noted that for someone in a windowless ship's cabin, no physical measurement he can make can tell him whether his ship is docked in a harbour, or sailing at steady speed on a smooth open sea. Newton^b came to the same conclusion:

"The motions of bodies in a given space are the same among themselves, whether that space is at rest, or moves uniformly in a straight line without any circular motion."⁵

This is *Galilean relativity*. It essentially says that the *laws of mechanics* are the same for all inertial observers, i.e. in all inertial frames of reference^c:

the laws of mechanics are the same for all inertial observers

Einstein Postulates (1)

We on Planet Earth are in a Galilean situation. No mechanical measurement can tell us whether the Earth is at rest with regard to some hypothetical absolute cosmic reference, or moving at a steady speed relative to it. Maxwell's^d laws of electromagnetics, however, imply a *luminiferous aether*, a physical medium for electromagnetic waves to propagate through^e. This would be an absolute 'at rest' for those waves.

Mechanical phenomena don't require an absolute at-rest; but Maxwell's laws of electromagnetics do. Einstein saw in this a conflict. He realized that for mathematical consistency one or the other had to go. He chose to eliminate the aether, writing in his seminal 1905 Special Relativity paper *On the Electrodynamics of Moving Bodies*^f:

"The unsuccessful attempts to discover any motion of the Earth relative to the 'light medium' suggest that the phenomena of electrodynamics, as well as those of mechanics, possess no properties corresponding to an absolute rest. But rather that the same laws of electrodynamics are valid for all frames of reference for which the equations of mechanics hold good^g. We will raise this conjecture to the status of a 'relativity postulate'. And will introduce another,

^a Galileo Galilei (1564–1642), Italian polymath.

^b Isaac Newton (1642-1727), English physicist.

^c A 'frame of reference' is essentially an observer's point of view.

^d James Maxwell (1831–1879), Scottish physicist.

^e For present purposes defined as such: "the hypothetical medium that electromagnetic waves and conceived as propagating through".

^f Einstein 1905.

^g i.e. for all inertial observers (p.2). Later restated as "Every law of nature valid in a coordinate system C, is also valid in a coordinate system C' in uniform translatory motion relative to it".

only apparently irreconcilable with the former, namely that light is always propagated in empty space with a definite velocity c , independent of the state of motion of the emitting body. The introduction of a 'luminiferous aether' will thus prove superfluous."⁸

He later amplified this to:

"Light *in vacuo* has a definite velocity of propagation, independent of the state of motion of the observer or of the source."⁹

In his 1916 Relativity article he added:

"According to the theory of relativity there is no such thing as a 'unique' (lit. 'specially favoured' or 'marked out') co-ordinate system to occasion the introduction of the æther idea. And hence there can be no æther-drift, nor any experiment with which to demonstrate it."¹⁰

The "unsuccessful attempts" he refers to are presumably the alleged 'null' result of the 1887 Michelson-Morley aether-drift experiment, discussed further below, and in detail in the companion 'aether volume'¹¹.

These two assumptions form the *Einstein postulates*. The first 'relativity postulate' says that all the *laws of physics* – and not just those of mechanics^a – are the same for all inertial observers. This is *Einsteinian relativity*:

– 1) *the laws of physics are the same for all inertial observers*

In modern relativistic jargon: no inertial observer is "privileged", or "preferred":

no inertial observer is "privileged", or "preferred"

The second 'speed-of-light postulate' says that the speed of light ' c ' in a vacuum is constant :

– 2) *the speed of light ' c ' in vacuo is invariant*^b.

Einstein held this to be the distinguishing characteristic of his theory:

"The Special Theory departs from classical mechanics, not through the postulate of relativity, but through that of the constancy of the velocity of light *in vacuo*."¹²

He made a further point of his theory's logical consistency:

"The chief attraction of the theory of Relativity is its logical unity. If *any single one* of its consequences proves to be inexact it must be abandoned. To modify it without destroying the whole structure seems impossible." (italics his)¹³

Clock slowing (1)

The second postulate of a constant speed of light for all inertial observers might at first sight appear contradictory. A wave^{c14} is not a material object, but a time-dependent *event*, a *disturbance* propagating through a *medium* at a *characteristic speed* c determined by the properties of that medium^{d15}:

wave = disturbance propagating through a medium at a characteristic speed c

^a p.2.

^b And implicitly independent of the state of motion of the emitting body.

^c Here always in the sense of *physical waves*.

^d Aether article.

A wave *inherently implies* a medium that it propagates through. The idea of waves without a medium – pond or sea waves without water, sound waves without air, light waves without a hypothetical aether^a – is senseless. For there to be a disturbance, *something* (some physical thing) has to be disturbed.

To say that the speed of light c is constant for all inertial observers, rather than through its medium, is thus like saying that the speed of sea waves relative to a boat is always the same, regardless of whether it sails upwind or downwind^{b16}. And is apparently nonsensical.

"Aha!" said Einstein, the difference is that at so-called 'relativistic' speeds comparable to that of light^c, firstly *clocks run slow* – so-called *time dilation*. And secondly, *lengths contract proportionally* in the direction of motion^d. The speed of light that an observer measures, the ratio of the two^e, is then always the same. He described his *eureka* moment:

"I had discussed every aspect of the problem with a friend of mine, the Italian Michele Besso^f. Returning home I suddenly I saw where the key lay. *Time* cannot be absolutely defined. Next day I said to him: 'Thank you, I've completely solved the problem'. With this new concept I resolved all the difficulties, and within five weeks the Special Theory of Relativity was completed."¹⁷

Einstein's reasoning was the following. Consider an observer A standing at a railroad station with a *photon clock*, a single photon of light^g reflected vertically between two mirrors, that emit a "tick" every time the photon hits them, Fig. 6a^h. If the mirrors were 1 m apartⁱ, for instance, and the speed of light was 1 m/s^j, the photon clock would tick once a second^k.

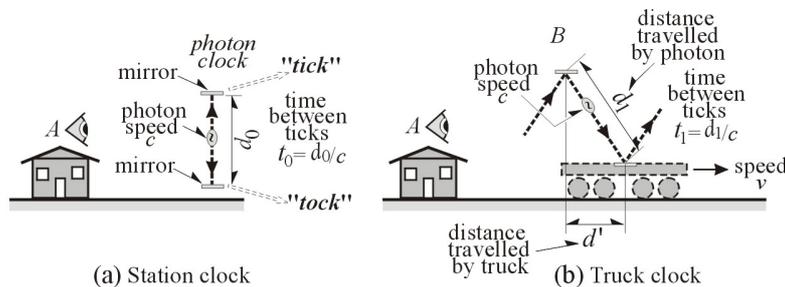


Fig. 6. Clock-slowing (1).

Now consider a second individual B with a similar clock on a *railroad truck* moving at a steady speed v , Fig. 6b. During the time the photon takes to travel between the mirrors, the truck moves forward a distance d' proportional to its speed^l. Pythagoras' theorem

^a Cf p.2.

^b Aether article.

^c The definition of 'relativistic'.

^d The Fitzgerald-Lorentz length contraction (below).

^e Speed being distance divided by time.

^f His long-term university friend.

^g Here considering light as particles.

^h The reason for using a photon clock is to be able to make use of the second constant-speed-of-light postulate.

ⁱ $d_0=1$ m.

^j $c=1$ m/s.

^k $t_0=1$ s.

^l $d'=vt_1$.

and a little simple algebra^a show that the distance d_1 the photon here has to travel is *greater* than its stationary value d_0 by a factor γ :

$$\gamma = \frac{1}{\sqrt{1 - \left(\frac{v}{c}\right)^2}} \quad (\text{eq.1})$$

called the *Lorentz factor* in honour of the Dutch physicist Hendrik Lorentz^b. Fig. 7 shows the overall path of the travelling truck B clock photon through space.

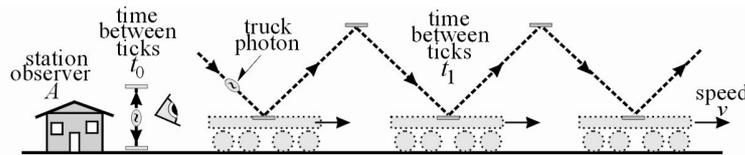


Fig. 7. Clock slowing (2).

The speed of light c being constant^c, the truck clock B then *ticks more slowly* than the station clock A. Meaning that *times* measured on it are *shorter* than those on the station clock by the factor γ . Equivalent relations hold for observer B's return journey. We discuss the turnaround later.

At low truck speeds v , the Lorentz factor γ is approximately unity and can be ignored. At relativistic speeds, however, it increases rapidly, becoming infinite at the speed of light^d, Fig. 8.

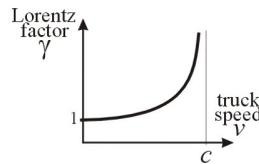


Fig. 8. Lorentz factor.

Clock absurdity (1)

If a travelling observer's clock runs more slowly, so also by implication do for him physical events in general, meaning that he *ages less* than if he were at rest. Einstein wrote in 1911:

"A living organism placed in a box, after a lengthy flight at approximately the speed of light, could return in a scarcely altered condition, while corresponding organisms on Earth had long since given way to new generations."¹⁸

In the same year Paul Langevin^e put this into its better known *twin form*. Twin A is an earthbound homebody, and twin B is an astronaut. Twin B undertakes a spaceship journey at near to the speed of light, returning to find that he is younger than his earthbound brother, Fig. 9.

^a Appendix, p.2.

^b Hendrik Lorentz (1853-1928), Dutch physicist.

^c Second Relativity postulate (p.2).

^d Where $v=c$, and the bottom line of the Lorentz factor (eq.1, p.2.) become zero.

^e Paul Langevin (1872-1946), French physicist.

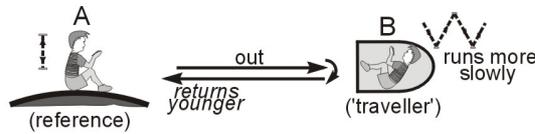


Fig. 9. Twins.

The same applies to two twins in spaceships free-floating in outer space^a, Fig. 10. Twin A sees the travelling twin B's clock running more slowly than his own.

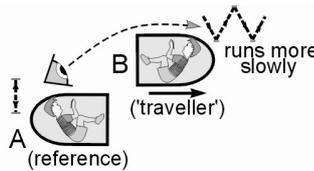


Fig. 10. Twin A's view.

The problem is that relative to twin B, *twin A* is the 'traveller'. Meaning that *his* clock runs slower and *he* ages less. Fig. 11. Because both twins are moving inertially, according to Einstein's first 'relativity' postulate both their viewpoints are correct^b.

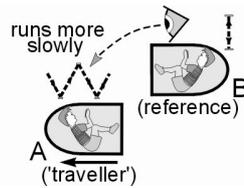


Fig. 11. Twin B's view.

Special Relativity thus predicts that two clocks can each run slower than the other:

two clocks can each run slower than the other

This is the essence of the so-called *clock paradox*^c. Being rationally absurd, so also on the philosophical *reductio ad absurdum* principle^d are the Einstein postulates, and by extension Special Relativity itself. This is resumed in Fig. 0-12^e.

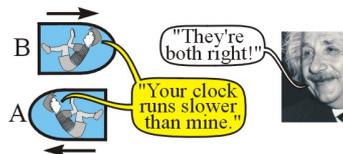


Fig. 0-12. Clock absurdity (1).

The clock absurdity alone is sufficient to falsify Special Relativity. Experimental refutations, of which there are many^a, are interesting but superfluous. Logical contradictions

^a And therefore moving inertially (p.2).

^b p.2.

^c The analogous 'twin paradox' is discussed below.

^d p.2.

^e Remembering that this is a *thought exercise*, unrestricted by practical considerations. Thought-exercise twins can pass each other at relativistic speeds and a hairswidth distance without risking scratching their spaceships' paint. And their pilots can carry out complex scientific measurements in the twinkling of an eye. In one's imagination, one can imagine anything one cares to imagine.

cannot exist physically. One doesn't need experiment to show that there are no square circles. Special Relativity is its own *reductio ad absurdum*:

Special Relativity is its own reductio ad absurdum

"Paradox"

A 'paradox' is defined in the dictionary as "a *seemingly* self-contradictory or absurd statement" (Italics ours). The classic example is 'Achilles and the tortoise', posed by Zeno of Elea^b:

"Achilles challenges the tortoise to a race. 'Ok', says the tortoise, 'But since you are ten times faster than me, give me a ten metre head start'. Achilles agrees and off they set. While Achilles covers the ten metres to where the tortoise started, the tortoise goes a further metre. While Achilles covers this, the tortoise goes another 10 cm. While Achilles covers this, the tortoise goes another 1 cm. And so on *ad inf.* Achilles never catches up with the tortoise."

The fallacy, of course, is that only *instants before* Achilles catches up with the tortoise are considered, effectively:

"Considering only instants before Achilles catches up with the tortoise, he never catches up with it."

The apparent contradiction and the paradox are explained.

The clock so-called "paradox" is not, however, a *seeming* contradiction, but a real one. Not conforming to the definition of a paradox, it should rather be called the *clock absurdity*. We evidently need to redefine the term "paradox":

"*Paradox*: 1) (common) a seeming contradiction that in fact is not; 2) (scientific) a real contradiction that makes a nonsense of a scientific theory, but it is not in Science's interest to admit that it does."

Clock absurdity (2)

An alternative form of the clock absurdity is shown in Fig. 13. The station observer A sees the travelling observer B's clock running slower than his own as before.

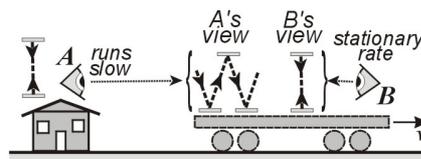


Fig. 13. Clock absurdity (2).

For the truck observer B moving together with his clock, however, its photon travels vertically between the two mirrors as if he was stationary. For him it continues to tick at its normal rate.

So each twin sees the travelling clock B running at a different rate. And again, because both are moving inertially, according to Special Relativity each of their view-points is correct.

Special Relativity thus further predicts that a single clock can run simultaneously at two different rates, which is likewise absurd.

^a Starting with the Michelson-Morley experiment (below).

^b Zeno of Elea (490–430 b.c.), ancient Greek philosopher.

Twin absurdity

What we have discussed till now is the *clock absurdity*, where each of two clocks runs slower than the other. The 'twin absurdity' proposed by Langevin^a has a slightly different form, Fig. 14. Here the spaceship twin first travels away from his earthbound brother for a certain time. Then comes the turnaround. Then he returns at the same steady speed.

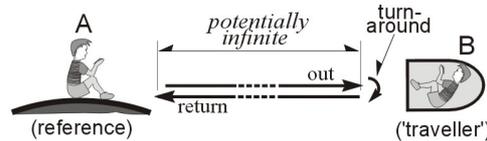


Fig. 14. Turnaround.

The steady speed out-and-return phases being of potentially infinite duration, for any given turnaround effect they can always be made sufficiently long to make it negligible in comparison. The turnaround can thus be ignored, only the steady-speed out-and-return phases needing to be considered.

Twin "explanations"

In spite of the rational senselessness of the twin result, there has been no lack of so-called "explanations" for it. According to the *en.wikipedia*:

"There have been numerous explanations, all based on asymmetry. Only one twin undergoes deceleration-acceleration, differentiating the two cases. In another version Max von Laue^b argued that the travelling twin switches inertial frames, and that this causes the difference. Einstein and others invoked gravitational time dilation to explain the aging."¹⁹

We will take the points one by one:

- 1) "There have been numerous explanations, all based on asymmetry. Only one twin undergoes deceleration-acceleration."

Whoever wrote that didn't understand the principle of relativity. Relative to^c the earthbound twin, the spaceship twin undergoes acceleration^d. Relative to the spaceship twin, the earthbound twin (together with the Earth and everything on it) undergoes acceleration. And since both twins are moving inertially, neither's view is "privileged" or "preferred". Relative to the twins there is no asymmetry.

And the turnaround as just seen being irrelevant, in fact makes a nonsense of all the above "explanations".

- 2) "Max von Laue argued that the travelling twin switches inertial frames, and that this causes the difference."

But how? The station twin sees the travelling twin moving inertially on both his outward and return legs, and the same clock slowing factor applies to each. And again, the turnaround is irrelevant. Please explain yourself a bit better, Dr von Laue.

- 3) "Einstein and others invoked gravitational time dilation to explain the aging."

^a Fig. 9.

^b Max von Laue (1879–1960), German physicist and Nobel laureate.

^c Seen by.

^d Deceleration and acceleration.

Firstly, this is a *thought exercise*^a. There are no experimental results to be explained. No twin ever demonstrably went off on a spaceship journey and returned younger than his earthbound brother. Einstein is effectively saying:

"My theory predicts that, due to the relative speed, the spaceship twin will return younger. This is explained by gravitational time dilation."

Make sense of *that* if you can!

Secondly, if clock slowing is in fact due to gravitational time dilation and not relative velocity, then the previous explanation must be wrong. But why? True to form, Einstein doesn't say.

Thirdly, gravitational time dilation derives from *General Relativity*. And not the Special Relativity being discussed here.

And fourthly, to limit discussion to the so-called "asymmetrical"^b case^c is effectively to say:

"Considering only the asymmetrical case, the asymmetry explains it."

This is an 'Achilles and the tortoise' type logical fallacy^d, that excludes the symmetrical case where both twins are in spaceships^e.

In spite of all of which:

"Neither Einstein nor Langevin considered the twin case to constitute a challenge to the self-consistency of relativistic physics. Einstein only called it 'peculiar'.²⁰

And in 1916 he declared:

"No contradiction to the foundations of Relativity can be constructed from the twin result."²¹

Oh yeah?! Can you say that again please, Albert? Just to be sure it came from you.

Naturwissenschaften

As if the meaninglessness of the above twin "explanations" were insufficient, in 1918 Einstein published yet another in the German scientific journal *Naturwissenschaften*. He recognized the existence of the twin absurdity:

"Even the devoutest adherents of the theory of Relativity cannot claim that for two clocks resting side by side, each one can be late relative to the other."²²

His verbatim version is reproduced in the appendix^f. It can be summarized:

- 1) during the steady-speed out-and-return phases, the travelling clock B runs more slowly, losing time as before
- 2) at the turnaround, gravitational time dilation^g causes it to speed up
- 3) calculation shows that the time gained is exactly twice that lost in the steady-speed out-and-return phases
- 4) the travelling twin B therefore ends up older than his earthbound brother
- 5) this completely clears up the paradox

^a Einstein called it a thought "experiment". But no replicable physical measurements are made.

^b Not in fact (point 1)).

^c Of earthbound and spaceship twins.

^d p.2.

^e Fig. 10, Fig. 11.

^f p.2.

^g Acceleration.

Comments, again point by point:

- 1) ok.
- 2) this firstly contradicts GR^a where gravity/acceleration causes causes clocks to *slow down*, not speed up. And secondly, it contradicts Einstein's previous 'gravitational' "explanation"^b.
- 3a) the steady-speed out-and-return and the turnaround phases being as noted^c *independent* – each can be as long or short as one likes – to say that the time gained in the one is exactly twice that lost in the other is nonsensical.
- 3b) "Calculation shows." *What* calculation, Albert? He unfortunately doesn't show the calculation that according to him shows
- 4) this contradicts all the previous versions where the travelling twin returns *younger*.
- 5) *how* does it clear it up, Albert? Again, he does not elaborate.

Imagine a high school physics student producing such an argument. He would be hauled up to the front of the class and ridiculed by all! And *Naturwissenschaften* is a highly respected scientific journal! One wonders what the editor thought when he read Einstein's submission. Maybe he didn't bother, seeing who it came from.

Most books on Einstein don't even mention the article, as if it didn't exist. The few that do gloss over it. Einstein's semi-official biographer, Abraham Pais, in his 1982 *Subtle is the Lord*, goes into considerable detail on almost all other aspects of Einstein's work. But in this case he simply states:

"In November 1918 Einstein published an article on the twin paradox."²³

William Shakespeare^d could have remarked:

"The biographer doth protest too little, methinks."^e

Resuming, Einstein provided *three* different "explanations" of the twin "paradox", all rationally incoherent, both internally within themselves and externally in terms of each other:

- 1) the original 'relative velocity' version^f
- 2) the 'gravitational time-dilation' version. In both of these the travelling twin B returns younger.
- 3) the *Naturwissenschaften* version, a mixture of the two. The travelling twin B here loses time during the steady speed phases as in 1). But *gains* twice that at the turnaround. Firstly contradicting version 2). And secondly, causing him to return *older* than his brother, contradicting both 1) and 2)

Researching mainstream physics journals and standard textbooks, Al Kelly^g found no less than *fifty-four* different "explanations" of the twin case, most implying that the others are wrong. They broke down into²⁴:

- 8 say the differential aging is inexplicable and a huge problem for Relativity (it sure is!)
- 4 say it is solely due to the acceleration

^a General Relativity.

^b p.2.

^c Fig. 13.

^d William Shakespeare (1564-1616), English poet, playwright and actor.

^e Cf the famous line in the play *Hamlet*: "The lady doth protest too much, methinks".

^f The organism in the box.

^g Al Kelly (1926-2005), Irish engineer.

- 9 say the acceleration has nothing to do with it
- 4 say that General Relativity gives the sole explanation
- 3 say GR has nothing to do with it
- 2 say that jumping inertial frames explains it (but don't say how)

More exotic and bizarre versions make up the remainder. These presumably include Einstein's own in *Naturwissenschaften*. Of all the fatuous "explanations"– and there is certainly no lack of them – this one from Albert E himself takes the biscuit. If anyone still believes in his capacity for rational thought: think again!

In spite of ...

In spite of all of which, Mainsteam Physics^a persistently insists that Special Relativity is Revealed Scientific Truth, and that its creator Albert Einstein was an all-time scientific genius. David Goodstein^b:

"There are theories in Science which are so well verified that they become promoted to the status of fact. An example is the Special Theory of Relativity. Although still called 'theories', such things are in reality among the best established facts in all human knowledge."²⁵

Clifford Will^c:

"Special Relativity has been confirmed by experiment so many times that it borders on the crackpot to say there is something wrong with it. The GPS wouldn't function if SR didn't work the way we thought it did."²⁶

Del Larson:

"If we try to come up with theoretical arguments to show how Special Relativity is wrong, we will lose. SR has been studied and celebrated for generations now. If there was a theoretical flaw, it would have been found long ago."²⁷

Isaac Asimov^f:

"No physicist who is even marginally sane doubts the validity of Special Relativity"²⁸

Lee Smolin^g:

"Cranks are a fact of life for working physicists. There seems to be a psychosis resulting in people believing they have disproved Relativity. Anyone in Relativity who is at all visible gets regular communications from such people."²⁹

John Farrell^h:

"There's nothing like Einsteinian Relativity to bring out the doubters, cranks and outright crackpots. A burgeoning underground of self-described experts publish their theories on the Net, exchanging ideas in a great battle against the Temple of Relativity. According to them it is not only wrong, but an affront to

^a University professors, editors of prestigious scientific journals, funding committee chairpersons, etc.

^b David Goodstein (1939–), Caltech Professor.

^c Clifford Will (1946–), Canadian physicist and Relativity crackpot.

^d Not true, as we will see.

^e It was found more than a century ago. The twin absurdity dates from 1911.

^f Isaac Asimov (1920-1992), American professor and science fiction author.

^g Lee Smolin (1955-), American theoretical physicist.

^h John Farrell (??), Boston science writer.

common sense, and its creator Albert Einstein was no less than a cheat^a. Their common themes are resentment of academic elites, suspicion of the peer-review process, and a deep-seated paranoia about government involvement in Science. They're always male – never female – normally professionals, and are always retired with years to spend on their pet theories. Their problem is that they often assume that Special Relativity is somehow wrong. When apart from numerous empirical tests, it is mathematically elegant and once fully understood is seen to be a true work of genius."³⁰

None of these writers, however, addresses the central inconsistency of Special Relativity, namely the clock absurdity. Their arguments are all of the form:

"Everyone knows that everyone knows that Relativity is correct. Therefore it is crackpot to question it."

But since when has popular opinion been a valid criterion for judging a scientific theory? (Good question!)

Resuming:

- 1) the second 'speed-of-light' postulate predicts that each of two observers will see the other's clock running slower than his own
- 2) the first 'relativity' postulate says that both views are correct
- 3) SR therefore predicts that two clocks can each run slower than the other
- 4) this being contradictory/absurd, so too are the Einstein postulates, and by extension Special Relativity itself

Further comments on the postulates are set out in the appendix^b.

DISSIDENCE, EXPERIMENTAL

Michelson-Morley

The question of the aether's existence is examined in detail in a companion article³¹. We will only summarize its principal findings here.

Starting with the famous Michelson-Morley experiment, observations were made over four days in July 1887, during an hour at noon and an hour at six o'clock in the evening³². M&M reported that:

"The relative velocity the aether with regard to the Earth is probably less than one sixth of the Earth's orbital velocity^c, and certainly less than one fourth"³³

In 1998 Héctor Múnera reanalyzed their results using modern statistical methods. He found that they give at a 95% confidence level^d:

- midday readings $v_{\epsilon} = 6.22 \pm 1.86$ km/s
- evening readings $v_{\epsilon} = 6.8 \pm 4.98$ km/s³⁴

^a You can say that again, John!

^b p.2.

^c Of 30 km/s.

^d A 5% probability of the result being due to chance.

^e Using the exotic symbol ' ϵ ' for the aether.

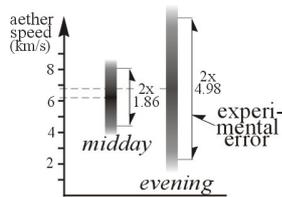


Fig. 0-15. Michelson-Morley results.

These speeds are evidently considerably less than the 30 km/s^a that M&M had been expecting. But in terms of their respective experimental errors, they are both nevertheless *very definitely positive*.

Einstein was somewhat coy about the M&M result. On some occasions he said he had not been aware of it when he wrote his Special Relativity paper^{b35}; and on others that he had^{c36}. Although as has been said, for a young physicist in 1905 not to have heard of the Michelson-Morley experiment would be like an electrician never having heard of Ohm's Law³⁷.

Special Relativity stands or falls with the existence of the aether. Firstly because it would provide a "preferred" reference frame, an 'at rest' for light waves^d, falsifying the first postulate.

And secondly, because the speed of light would not be invariant with respect to the observer, as the second postulate asserts. But constant through its medium, the aether, like any other physical wave.

It is ironic that the experiment most commonly quoted in *support* of Special Relativity (including by Einstein himself³⁸) is the one that most simply *refutes* it.

So we don't even need to resort to the clock or twin absurdities. SR was already refuted experimentally by Michelson-Morley 18 years before it was formulated!

Special Relativity was refuted 18 years before it was formulated

Dayton Miller

The other principal interferometer experimenter was *Dayton Miller*^e. His most important work was done during 1925-6 on top of Mt Wilson in California. The idea was to reduce any hypothetical 'aether-entrainment'^f, the aether being 'dragged along' by the Earth.

Miller made a total of 12'000 sets of observations, as opposed to Michelson's 36. And he made them over the course of a year, something that Michelson and Morley recognized needed doing, but never did^{g39}. He obtained an aether-wind of speed:

$$v_{S\epsilon}^h = 8.22 \pm 1.39 \text{ km/s}$$

coming in from an astronomical directionⁱ⁴⁰ ($\alpha = 5.2$, $\delta = -67^\circ$), that of the *Dorado* constellation in the Great Magellanic Cloud⁴¹.

Specimen measurements are shown plotted against sidereal time in Fig. 16a. And his averaged overall results in Fig. 16b^{a42}.

^a The Earth's orbital speed around the Sun (Fig. 4a).

^b For instance in a 1952 letter.

^c He freely refers to it in his 1916 book, and there is evidence he knew of it as early as 1899.

^d The speed of light would be the same in all directions in that frame, and in no other.

^e Dayton Miller (1866–1941), American physicist and astronomer.

^f Fiennes 2019a, p.9.

^g Aether article.

^h Of the Solar system with respect to the aether.

ⁱ Aether article.

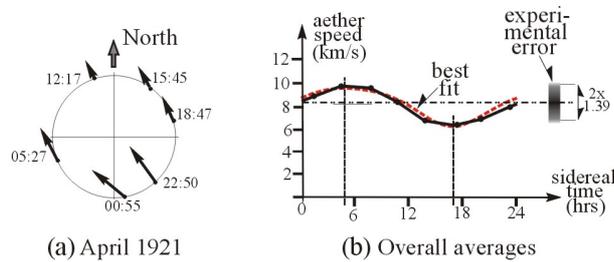


Fig. 16. Miller's results⁴³.

Miller's consistently positive results worried Einstein considerably. He wrote:

"Not for one moment did I take Miller's results seriously. I assumed that they are based on a fundamental error. Otherwise the Special Theory of Relativity, and with it the General Theory in its current form, would both collapse like a house of cards. Experimentum summus judex"^b (italics ours)

He sent Miller a letter suggesting that his results were due to temperature variations.

Miller, however, was an extremely careful and meticulous experimenter, and had already spent two years in Cleveland doing an exhaustive series of control tests to eliminate just that possibility^{c45}. He told a local newspaper:

"The trouble with Professor Einstein is that he knows nothing about my results. He ought at least to give me credit for knowing about temperature differences. I am not so simple as that."⁴⁶

So Einstein, having declared that:

"No amount of experimentation can ever prove me right. But a single experiment can prove me wrong."⁴⁷

And that:

"All the other fellows look not from the facts to the theory, but from the theory to the facts. They cannot extricate themselves from a conceptual net, but flop around in it in a grotesque way".⁴⁸

When Miller came up with such an experiment, Einstein said no: my theory is correct so the experiment must be wrong. Not much "*experimentum summus judex*" here! In Einstein's case:

"Mea theoria summus judex"

('my theory is the supreme judge'). We already noted his:

"There can be no æther-drift, nor any experiment with which to demonstrate it." (italics ours)^d

So who, pray, is in this case "looking not from the facts to the theory, but from the theory to the facts"; and "unable to extricate himself from a conceptual net"? (Good questions!) Thomas Huxley^e spoke of:

^a Somewhat higher than M&M's (p.2) due to Cleveland being at a higher latitude (41°) than Mt Wilson (34°).

^b "Experiment is the supreme judge."

^c Aether article.

^d p.2.

^e Thomas Huxley (1825–1895), English biologist.

"The great tragedy of Science: a beautiful hypothesis slain by ugly facts."

Michelson-Morley's and Miller's^a ugly facts resoundingly slew Einstein's "beautiful" SR hypothesis, confirming experimentally what the clock absurdity had already shown conceptually: namely that the Einstein postulates are logically incoherent and that Special Relativity is wrong.

At Mt. Wilson today there is no record of the exhaustive ground-breaking work done there by Miller. But only a memorial plaque to Michelson and Einstein (!)⁴⁹. Reginald Cahill^b writes:

"It was an injustice and a tragedy that Miller's contributions to physics were not recognised in his lifetime. Not everyone is as careful and fastidious as he. He was ignored simply because it was believed then, as it is now, that absolute motion is incompatible with Special Relativity (it is!). It was accepted without evidence that his experiments must be wrong. This shows once again how little physics is evidence based – as Galileo discovered to his cost. Even today Miller's experiments attract a hostile reaction from the physics community."⁵⁰

Múnera noted that of the six aether wind experiments that he analyzed^c, carried out between 1887 and 1932, all without exception *obtained* non-zero aether speeds. But with the notable exception of Dayton Miller, all *reported* negative results⁵¹. An Italian proverb runs:

"*Tra il dire e il fare, c'è di mezzo il mare.*"

('between the saying and the doing, in the middle is the sea.')

In physics, it would seem, there can be a similar discrepancy between the '*fare*' (the results) and the '*dire*' (the reporting of them).

Hafele-Keating

A well-known modern experimental so-called "confirmation" of Special Relativity is the 1971 *Hafele-Keating*^d *experiment*, carried out under the supervision of a U.S. government agency. Four caesium atomic clocks were flown twice around the world aboard commercial airliners, first eastward and then westward. They were then compared with similar ground clocks at the United States Naval Observatory. Due to their height, the flying clocks needed a gravity adjustment, which is correctly given by General Relativity^e.

In his preliminary analysis published in *Nature*, Hafele wrote:

"The standard answer – that moving clocks run slow – is almost certainly incorrect. The difference between theory and measurement is disturbing. Most people (myself included) would be reluctant to agree that the time gained^f by any one of these clocks is indicative of anything."⁵²

His final report published in *Science* in 1972 however stated:

"The theory predicted that, compared with the ground clocks, the eastward clock should lose 40 ns and the westward clock gain 275 ns. The values of 59

^a And also Michelson's.

^b Reginald Cahill (1948-), Australian theoretical physicist.

^c M&M (1887), Miller (1926), Piccard and Stahel (1926), Illingworth (1927), Joos (1930), Kennedy and Thorndike (1932).

^d Joseph Hafele (1933-2014), American physicist.

^e Richard Keating (1941-2006), American astronomer.

^f Below.

^f *Sic.* SR says that time should be *lost*.

ns and 273 ns obtained provide an unambiguous empirical resolution of the famous 'clock paradox'.⁵³

A 1972 *Nature* leader echoed this:

"The agreement between theory and experiment was most satisfactory."⁵⁴

So how could Hafele's initial "The difference between theory and measurement is disturbing" have subsequently become "The agreement between theory and experiment was most satisfactory", a complete about turn? According to the *en.wikipedia*:

"In a frame of reference at rest with respect to the Earth's centre, the east-bound clock, flying in the direction of the Earth's rotation, moves faster than the one on the ground. And the westbound clock, flying against the Earth's rotation, moves slower. The outcome was in agreement with predictions of Relativity to a high degree of confidence."⁵⁵

But wait a minute! A "frame of reference at rest with respect to the Earth's centre" *directly contradicts* Special Relativity, which specifically states that there is *no preferred* 'at rest' frame^a. And that clock-slowness depends on the *relative speeds* of the *observers*, in this case the respective clocks.

Relative to the ground clock A, the speeds of the airborne clocks B₁, B₂ are *the same*, Fig. 17, meaning that they should show *equal time lags*. To bring in the Earth's centre as a preferred 'at rest' reference is a blatantly *ad hoc*, relativity-contradicting *fudge*^b.

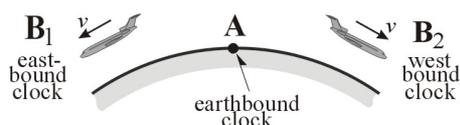


Fig. 17. Hafele-Keating.

How then did H&K attempt to justify their 180-degree about turn? Their argument was that since the ground clock rotates together with the Earth, it is not inertial and doesn't therefore satisfy the prerequisite of Special Relativity. Another reference frame had to be found, which turned out to be the Earth's centre^{c56}.

Exactly the same, however, applies to the flying clocks which likewise rotate together with the Earth. On this basis the whole experiment is invalid as a test of Special Relativity. H&K's argument effectively ran:

- we carried out an experiment to verify Special Relativity
- the results refuted Special Relativity
- no problem, because the experiment wasn't a valid test of Special Relativity
- we found another, non-relativistic way of interpreting the results
- therefore Special Relativity is resoundingly confirmed"

And the prestigious peer-reviewed mainstream journals *Science* and *Nature* underwrote this travesty of logic and Science!

In their 1972 paper H & K didn't publish their original readings. When Al Kelly obtained them from the U.S. Naval Observatory, he found firstly that extensive undisclosed alterations had been made to the raw data. And secondly, that the accuracy of the atomic

^a p.2.

^b And considering only the flying clocks B₁ and B₂, each should run slower than the other – the clock absurdity again.

^c Or alternatively, the fixed stars.

clocks *no way* justified the conclusions⁵⁷. The atomic clock's inventor Louis Essen^a also agreed that:

"The clocks were not sufficiently accurate to detect the small effect predicted."⁵⁸

And just how did the H&K experiment "provide an unambiguous empirical resolution of the famous clock paradox". Taking a leaf out of Einstein's copybook^b, they don't say.

Far from unambiguously *confirming* Special Relativity, the H&K experiment unambiguously *refutes* it. Were the editors of *Science* and *Nature* incapable of noticing that? Al Kelly concludes:

"The H&K experiment may well rate as one of the biggest hoaxes in the history of modern Science."⁵⁹

GPS

Related to the H&K experiment is the *GPS* (Global Positioning System). Its functioning is shown schematically in Fig. 18. Points on Earth are located via the transit times t_a , t_b , t_c of signals from three^c satellites A, B, C, whose instantaneous positions are determined by ground stations using the same principle.

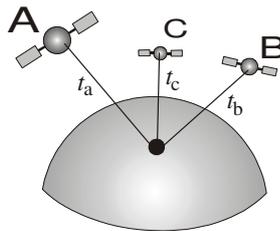


Fig. 18. GPS system.

All the clocks need to be highly accurately synchronised. Due to their altitude, the satellite clocks require a gravitational adjustment, which is correctly given by General Relativity.

The satellite clocks also need velocity corrections. According to the official documentation these are calculated using Special Relativity. This is a lie. The GPS employs the "ECI" (Earth Centred Inertial) reference frame⁶⁰, the same as that of the Hafele-Keating fudge. And which as just seen directly contradicts Special Relativity.

The ground stations also need synchronizing signals. But these are found to travel at different speeds eastwards and westwards⁶¹, again contradicting Special Relativity^d.

Clifford Will's:

"The GPS wouldn't function if SR didn't work the way we thought it did"^e

is therefore another blatant lie. The communications specialist Ronald Hatch^f wrote:

"The GPS system flat out contradicts Einsteinian Relativity, which is clearly incorrect."⁶²

Another writer is more charitable:

^a Louis Essen (1908-1997), English physicist.

^b Cf p.2, point 5).

^c In practice four. The extra satellite provides a time check.

^d The second 'constant speed of light' postulate (p.2.).

^e p.2.

^f Ronald Hatch (1938-), American physicist with 30 GPS patents to his name.

"When we say that the GPS contradicts the two principles of Special Relativity, we don't mean that *everything* in Special Relativity is incorrect. *Some* of its deductions have strong experimental support."⁶³ (italics ours)

Even a stopped clock shows the right time twice a day – with admirable precision!

DISSIDENCE, THEORETICAL

Dingle

Aether-wind measurements refute experimentally both the Einstein's postulates. A number of physicists have challenged Special Relativity theoretically.

In Germany in 1931, the editors of a booklet entitled "*100 Autoren gegen Einstein*"^a, collected contrary publications from mainly German sources, while simultaneously protesting the "scientific terrorism" being practiced by fundamentalist Einsteinians⁶⁴.

A prominent English anti-relativist was *Herbert Dingle*^b. President of the Royal Astronomical Society, and Professor Emeritus of the History and Philosophy of Science at London's University College, he was an acknowledged authority on Relativity. He published two books on the subject, one of which became a standard text in English and American Universities for over 30 years. He also wrote the respective sections in the *Encyclopaedia Britannica*.

Later in his career he came to doubt the official "explanations" of the twin "paradox", and published an article in *Nature* to that effect. It was replied to by the eminent English astrophysicist Sir William McCrea^c. But when Dingle wrote an answer to McCrea, neither *Nature* nor any other scientific journal would print it. As far as the public debate was concerned McCrea was seen to have had the last word⁶⁵.

To have his say, Dingle published a book *Science at the Crossroads*. In it he accused the scientific community of:

"A conscious departure from rectitude"⁶⁶.

Rather than stimulating discussion, however, the book was printed in few copies and soon became practically unavailable. In spite of his eminence and qualifications, Dingle was from then on branded a crank.

Commenting on Dingle's book in *The Times* in 1971, Bernard Levin^d gave three reasons why he as a layman supported Dingle:

- 1) in disputes between the orthodox scientific theory and its challengers, the orthodoxy has usually been proved wrong, and has defended its wrongness with deplorable methods. This seems to be the present case.
- 2) Dingle couches his arguments in beautifully lucid prose, whereas his opponents use language that is often incomprehensible even to those familiar with the subject
- 3) I see in Dingle a man who stands *unus contra mundum*, battling almost alone in his belief that Einstein is wrong. This is the strongest element in my feeling."⁶⁷

We can formalize the second point as the *Bernard Levin intelligibility principle*:

*he who understands explains understandably;
he who doesn't, doesn't*

A corollary is the advice given by Niels Bohr^a:

^a "*100 Authors against Einstein*".

^b Herbert Dingle (1890–1978), English physicist.

^c William McCrea (1904-1999), English mathematician and astronomer.

^d Bernard Levin (1928–2004), English journalist.

"Never express yourself more clearly than you can think."⁶⁸

Essen

Another eminent English theoretical anti-relativist was the physicist Louis Essen^b. Head of the National Physical Laboratory and the inventor of the atomic clock^c, he became interested in Special Relativity and repeated Michelson-Morley's experiment using radio waves. He disagreed with the 'null' interpretation:

"No one attempted to refute my arguments", he wrote, "But I was warned that if I persisted I was likely to spoil my career and pension prospects."⁶⁹

In 1988, safely retired and able to express his views, he wrote an article entitled *Relativity – joke or swindle?* In it he said:

"A common reaction of physicists to Relativity is that although they don't understand it themselves, they think it is so widely accepted that it must be correct. Until recently this was my own attitude. But Relativity has always had its critics. Ernest Rutherford^d called it 'a joke'; and Frederick Soddy^e 'an arrogant swindle'. Today, however, the theory is so rigidly held that young scientists dare not express their doubts."⁷⁰

He concluded:

"Special Relativity is not a theory, but simply a number of contradictory assumptions together with actual mistakes. I don't think Rutherford would have regarded it as a joke if he had realised how much it would retard the development of Science."⁷¹

Others

Like Miller, neither Rutherford nor Soddy were scientific lightweights. Rutherford was the discoverer of the atomic nucleus^f, for which gained a Nobel prize and became known as "the father of nuclear physics". It is said that when Wilhelm Wien^g once tried to impress him with the splendours of Relativity, and failing, exclaimed in despair:

"No Anglo-Saxon can understand Relativity!"

Rutherford guffawed and replied:

"No. They've got far too much sense!"⁷²

Frederick Soddy was a one-time co-worker of Rutherford's, and likewise a Nobel laureate. At a gathering of Nobel prize winners in June 1954 he declared Relativity to be:

"A swindle, an orgy of amateurish metaphysics."^{h73}

Another English Relativity doubter was the self-taught electrical engineer Oliver Heavisideⁱ. A loner who spent most of his life at odds with the scientific establishment, he

^a Niels Bohr (1885–1962), Danish physicist and founding father of quantum physics.

^b Louis Essen (1908-1997), English physicist.

^c p.2.

^d Ernest Rutherford (1871–1937). New Zealand physicist and chemist

^e Frederick Soddy (1877–1956). English radiochemist.

^f In 1909.

^g Wilhelm Wien (1864–1928), German physicist.

^h His comments were later "edited out" of the official publication.

ⁱ Oliver Heaviside (1850–1925), English engineer and mathematician.

nevertheless changed the face of mathematics and Science for years to come⁷⁴. He too thought Einstein had to be joking:

"Relativity doesn't agree with me. It is the most unnatural and difficult way of representing the facts that could be imagined. I really think that Einstein is a practical joker, pulling the legs of his enthusiastic followers each more *einsteinisch* than he. He knows the weakness of his theory, and only pro-pounds it to annoy."⁷⁵

A further well-known dissenter was the Serbian electrical engineer Nicola Tesla (1856-1943), the inventor of alternating current (a.c.) which is today the standard form of electric power. In a 1935 *New York Times* interview he called Relativity:

"A mathematical garb which fascinates and dazzles, blinding people to its underlying errors. It is a beggar clothed in purple whom ignorant people take to be a king."⁷⁶

Albert Michelson^a, according to the Thomas See^b:

"Openly rejected Relativity on the grounds that it does not account for the transmission of light, but holds that the aether should be thrown overboard"⁷⁷

In spite of being a religious agnostic⁷⁸, Michelson never gave up his belief in the aether's existence to his dying day^c, and said he was sorry to have unwittingly helped create the "monster" of Relativity⁷⁹.

The Nobel prize judge H. Nordenson:

"People express astonishment that Einstein was not awarded the Nobel prize for Relativity, considered by many to be one of the most outstanding achievements of this century. I do not hesitate to declare that it is not only among the most sensational fancies. But is also one of the most serious logical incoherencies in the history of Science."⁸⁰

Cahill

In 2002 Reginald Cahill re-examined the Michelson-Morley and Miller interferometer data. He found that both had failed to take into account:

- 1) the FitzGerald-Lorentz *length contraction*^d
- 2) the *refractive index* of the medium, in this case air

The FitzGerald-Lorentz contraction refers to a *vacuum*. But the Michelson-Morley and Miller experiments were carried out in *air*, where the speed of light is somewhat lower. In this case the two effects *don't* exactly cancel out, but leave a *small residual*, which is what Michelson-Morley, Miller and others were measuring.

In 2006 Cahill did his own aether wind experiment using a coaxial cable and two atomic clocks linked by optic fibre. He obtained an aether speed of ~400 km/s from an astronomical direction ($\alpha=5.5$ hr, $\delta=-70^\circ$), close to Miller's values^e.

After making the necessary length contraction and refractive index corrections, Michelson-Morley's and Miller's aether speeds likewise agree with Cahill's. He wrote:

^a Of Michelson-Morley fame.

^b Thomas See (1866–1962), American astronomer. His attacks on Einsteinian Relativity led to his being fired from both the observatories he worked at. He ended his professional years in an island outpost in California.

^c Obviously, since his own experiment had demonstrated it.

^d Known by Miller, but not by M&M at the time of their experiments.

^e p.2.

"It is now belatedly understood that numerous experiments, beginning with Michelson-Morley's, have always shown that the Einstein postulates are false; that there is a detectable 'space'^a; and that motion through it has been repeatedly observed since 1887. In denying such obvious empirical facts Special Relativity is just silly. Michelson died not realising that he had observed absolute motion^b. Ironically, he received a Nobel prize for reporting that he had not observed what in fact he had."⁸¹

Doepler effect

Sound is a pressure disturbance propagating through the air at a characteristic speed $c=1240$ km/h determined by the properties of the air medium, Fig. 19a.

A cyclist pedalling in the opposite direction to the sound waves then experiences them as 'bunched up', with a higher frequency than if he were stationary^c, Fig. 19b. This is the so-called *Doepler effect*.

Similarly, when pedalling in the same sense as the sound waves he experiences them as 'spread out', with a lower frequency than if he were at rest, Fig. 19c.

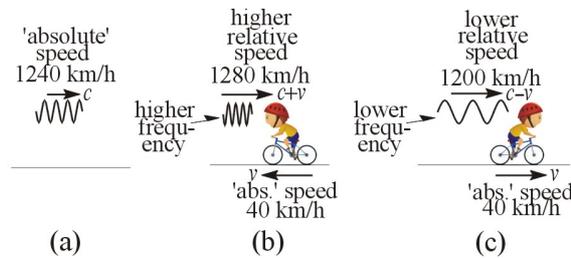


Fig. 19. Sound waves.

The Doepler effect thus depends on the *differing relative speeds* of the sound waves relative to the observer^{d82}. Were this speed always the same, he would experience no Doepler effect:

no relative wave speed difference: no Doepler effect

That electromagnetic waves *do in practice* show a Doepler shift^{e83}, means that their speed relative to the observer *cannot* be invariant as Einstein's second postulate holds.

Lorentz Aether Theory

Once the nonsensical Einstein postulates are abandoned, therefore, and the existence of the aether is recognized, everything falls neatly into place. The result is known as the *Lorentz Aether Theory* (LET). Today it comes in various versions^f, but for present purposes we will define it simply as:

Lorentz Aether Theory = there is an aether

The 'aether' again being by definition 'the hypothetical medium that light propagates through'^g. And whose properties determine the characteristic speed of light c , as for any standard physical wave.

^a The aether. One of his ways of avoiding the "unspeakable ae-word".

^b Ditto.

^c Assuming for simplicity there is no wind.

^d Cyclist.

^e For instance, the spacecraft flyby shift used to calculate the aether wind.

^f Designed to minimize its conflict with Relativity.

^g p.2, note.

Clock slowing

Returning to the station and truck observers^a, the station observer A is now stationary *in the aether*. And the travelling observer B's speed v is *through the aether*, rather than relative to observer A. The speed of light is similarly invariant though its medium, the aether, as opposed to relative to an observer.

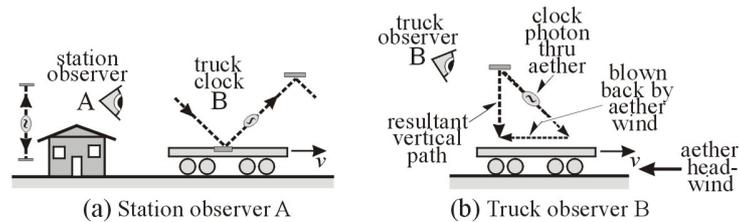


Fig. 20. Lorentz Aether Theory (1).

The speed of light though the aether being constant, the station observer A sees the truck clock B running slower than his own as before, Fig. 20a.

To compensate for the aether headwind^b, the truck clock B photon here has to head somewhat upwind^b, resulting in the previous clock slowing factor γ^c , Fig. 20b. In terms of the time t_0 measured on a stationary clock, that of a clock travelling through the aether at speed v is then:

$$t = \frac{t_0}{\gamma} \quad (\text{eq.2})$$

The stationary^d observer A sees the travelling^e clock B running slower than his own as before. And the travelling observer B sees the stationary clock A running *faster* than his own. So there is no clock absurdity.

Length contraction

Length contraction is likewise a function of the speed through the *aether*, rather than relative to an observer. It can be considered an *experimental result*, demonstrated by the null results obtained in vacuum interferometers^{f84}.

The stationary observer A sees the travelling observer B's lengths contracted as before. The observer B's measuring rule being contracted, he sees the stationary observer A's lengths as *longer* than his own. But he doesn't see *his own* lengths contracted, since both they and his rule are equally shortened. The travelling length l of a stationary length l_0 is then:

$$l = \frac{l_0}{\gamma} \quad (\text{eq.3})$$

Mass increase

Mass increase is similarly a function of the speed through the *aether*. A not particularly rigorous^g way of seeing this is the following. Imagine applying a force to a massive body.

^a Fig. 6.

^b When swimming across a fast-flowing river, one has to head somewhat upstream and takes longer to cross.

^c eq.2 (p.2). See also the aether article.

^d In the aether.

^e Through the aether.

^f For instance the Illingworth, Joos and LIGO results (aether article).

^g Sufficient for our purposes.

As its speed increases, its length decreases by the Lorentz factor γ^a , till at the speed of light c it is zero.

There, however, being no such things as 'negative lengths', this sets a limit to the acceleration. And from Newton's 2nd law^b, the only way for a finite force to result in no acceleration is for the body to have infinite mass.

Mass must thus increase with speed by a factor that is unity at zero speed and infinite at the speed of light c . This is evidently our old friend the Lorentz factor γ . The 'relativistic mass' m at speed v of a body with rest mass m_0 is then:

$$m = \gamma m_0 \quad (\text{eq.4})$$

General

The above relations are born out experimentally. Clock-slowing is demonstrated by *muons*, subatomic particles produced by cosmic rays hitting the Earth's outer atmosphere. Being unstable with an at-rest half-life of 1.5 ms, few in theory should reach the Earth's surface.

In fact far more than expected do. The reason is that, travelling through the aether at 99.4% of the speed of light, their Lorentz factor $\gamma=9$ increases their half-life to $9 \times 1.5 = 13.5$ ms^c, enabling the observed number to arrive.

The FitzGerald-Lorentz length contraction is confirmed by vacuum interferometer experiments^d. Mass increase is seen in cyclotrons^e. The velocity of particles orbiting through the aether at speeds close to that of light cannot be increased significantly. Additional energy inputs thus add to their *mass*, requiring a stronger magnetic field to keep them in orbit^f.

In most cases, however, Special Relativity *apparently* works in practice. The reason is not that it is correct. But rather that since the aether speeds of earthbound observers is in practice very low, of the order of 0.1% of the speed of light, the errors involved in taking the observer rather than the aether as the reference are normally imperceptible. The effects only become apparent where very high accuracy is required, such as in the GPS system^{g85}.

Resuming, Special Relativity is:

- 1) *nonsensified*^h by the clock absurdity
- 2) *falsified* by:
 - a) a wide range of aether-wind measurements, starting with Michelson-Morley's
 - b) the Hafele-Keating experiment

Being logically incoherentⁱ, the Einstein postulates cannot both be right. In fact both are wrong. Interferometer and other aether-wind experiments demonstrate the existence of the aether, falsifying both postulates^j. The cosmic microwave background (CMB) provides an intrinsic at-rest^{k86}, re-falsifying the first postulate.

^a eq.3 (p.2).

^b $F=ma$.

^c eq.1 (p.2).

^d p.2.

^e Circular particle accelerators.

^f The magnitude of this field enables the particle mass to be calculated.

^g Discussed further in the aether article.

^h Made a nonsense of.

ⁱ Leading to the clock absurdity (p.2).

^j Providing a preferred at-rest (1st postulate), and implying a not-constant speed of light (2nd postulate).

^k Spacetime article.

When Einstein chose to reconcile mechanics and electromagnetics by abolishing the aether^a, he made the wrong choice.

GENERAL RELATIVITY

Equivalence principle

Special Relativity is restricted to inertial motion where there is no acceleration. After this Einstein turned his mind to *gravity*. To put the relations into mathematical form, however, he first had to learn a new technique, tensor calculus, which took him eight years⁸⁷.

The outcome was 1915 *General Relativity*. As everyone knows, this is highly complex and mathematical, comprising:

"A set of ten coupled hyperbolic-elliptic nonlinear partial differential equations, known as the Einstein field equations, which take many pages to write down – and a deep breath just to say."⁸⁸

The basic idea is however again very simple. Einstein recounted how after two years of excruciating mental torment, his *eureka* moment – what he later called "the happiest thought of my life" – came while he was sitting in his office in Bern:

"Suddenly a thought struck me. A man falling freely from the roof of a house doesn't feel his own weight."⁸⁹

In space-age terms, an astronaut in a windowless space capsule cannot distinguish between being:

- 1) free-floating in deep space, Fig. 21a
- 2) in free fall in a gravitational field, Fig. 21b

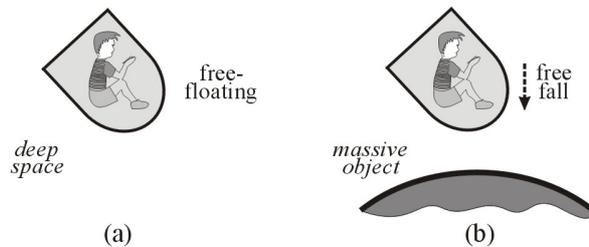


Fig. 21. Equivalence principle (1).

And correspondingly between being:

- 1) at rest on the surface of a massive object, Fig. 22a
- 2) in deep space accelerated by the capsule's engines, Fig. 22b

^a p.2.

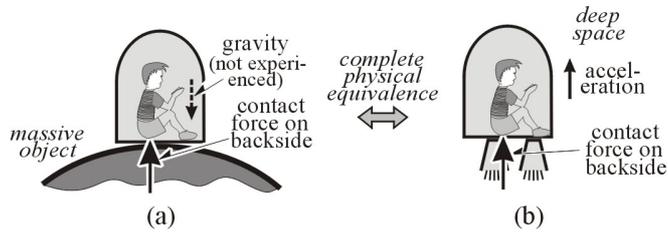


Fig. 22. Equivalence principle (2).

Einstein called this the *Equivalence Principle*:

"We assume the *complete physical equivalence* of an accelerated reference frame and a gravitational field^a."⁹⁰ (italics ours)

He saw in it the means to extend Special Relativity to include gravitation⁹¹.

Unfortunately, however, Einstein failed to distinguish between *individual subjective* and *collective objective* realities. True, an astronaut in a windowless space capsule cannot differentiate between the conditions of Fig. 21a,b. But we-the-rest-of-us looking on from the outside can. And should the free-falling astronaut^b hang in there long enough, he too will discover that he is not free-floating in deep space. Or maybe better: there will no longer be any 'him' to discover that he isn't.

The same applies to "A falling man doesn't feel his own weight". True, he himself doesn't. But that doesn't mean that gravity isn't acting on him. When sitting on a chair I also don't feel my own weight, but only the force between the chair and my bum. That doesn't mean that gravity isn't still pulling me down.

In fact, the conditions of Fig. 21a,b *aren't* exactly equivalent. In a gravitational field there is a *tidal force*, a somewhat stronger gravity at the bottom of the capsule than at the top, Fig. 23a. The difference is normally minimal. But it exists and with sufficiently sensitive instrumentation can be measured. This force causes objects in a gravitational field to become *elongated*, Fig. 23b. On Earth it is responsible for the tides: hence the name.

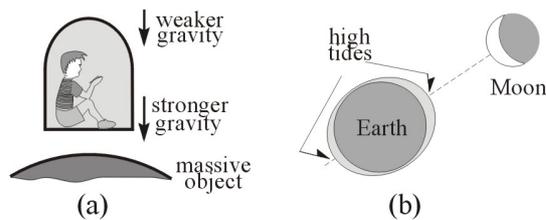


Fig. 23. Tidal force.

Einstein continues his quote:

"Whenever an observer detects the presence of a force acting on all objects in proportion to their mass, he is in an accelerated reference frame^c."⁹²

Here I am, sitting quietly down here on Planet Earth minding my own business, and fondly *imagining* I am inertial, subject to no acceleration^d. But since I detect a force acting on my backside proportional my mass, according to Einstein I am accelerating away from the Earth at $g=9.81 \text{ m/s}^2$, Fig. 24. Given that the Earth continues in intimate contact with

^a The equivalence symbol in Fig. 22b.

^b Fig. 21b.

^c Ditto.

^d Neglecting the minimal acceleration due to the Earth's rotation.

my backside through the intermediary of my chair, it too must be correspondingly accelerating.

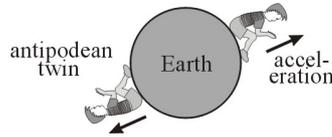


Fig. 24. Antipodean twins.

Exactly the same, however, applies to my antipodean twin. Meaning that the Earth must be accelerating simultaneously in opposite directions. This being rationally absurd, it is effectively an *antipodean twin absurdity*. And correspondingly makes a nonsense of the Equivalence Principle. Quite apart from the fact that with this acceleration, both I and my antipodean twin would in relatively little time surpass the speed of light, prohibited by SR.

Einstein continues his quote, Fig. 25:

"A freely falling man does not feel his own weight because there exists – at least in his immediate surroundings – no gravitational field. In his reference frame a new gravitational field cancels that due to the Earth".⁹³

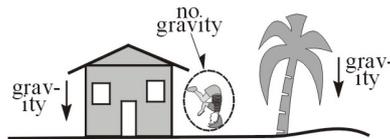


Fig. 25. Falling man.

Taking his "complete physical equivalence"^a at face value (how else, given the strength of his affirmation?), and since the only known source of gravity is *mass*, Einstein is effectively implying that the act of falling instantaneously creates a mass equal to the Earth's, and that instantaneously vanishes when the man hits the ground.

But how does this new gravitational field act only on the falling man, and not on the objects in his vicinity? Einstein doesn't say. Neither does he explain how the instantaneous creation and extinction of this new mass conform to the conservation of mass/energy.

Rather than creating a mass equal to the Earth's, maybe falling men are instantly surrounded by rings of gravity annihilating fairies. (Einstein doesn't say what happens to falling women.)

Spacetime (1)

In 1907 Einstein's old Zurich maths teacher Hermann Minkowski^b considered a photon moving at the speed of light c from a point 'a' to a nearby point 'b' in 3-d space, taking time dt , Fig. 26.

^a p.2.

^b Hermann Minkowski (1864-1909), German mathematician.

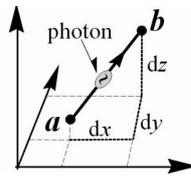


Fig. 26. Minkowski space-time.

For incremental axis displacements dx , dy , dz , Pythagoras' theorem gives:

$$dx^2 + dx^2 + dz^2 = (cdt)^2 \quad (\text{eq.5})$$

Based on this simple piece of high school geometry, Minkowski resoundingly declared that:

"Henceforth space by itself, and time by itself, are doomed to fade away into mere shadows. Only a union of the two will preserve an independent reality."⁹⁴

To which Einstein added:

"For us physicists the distinction between past, present and future is only an illusion, however persistent."⁹⁵

Well, Albert, maybe for you physicists. But for us lay people the distinction is very real. The past is a *memory*, neural traces in our present brains. The future is our *present idea* of how things could come to be, likewise neural traces in our present brains. The only reality we ever actually physically experience is that existing right here right now.

Spacetime (2)

Gravity, according to Einstein, is not a force acting between massive objects. It is caused by the *curvature of spacetime*:

"Einstein showed that rather than objects pulling on each other, gravity is best understood as a warping of spacetime. Objects move along *geodesics*, the shortest distance between two points on a curved surface. The Moon appears to curve as it orbits the Earth. But in reality it follows a straight line in curved spacetime."⁹⁶

'Spacetime' being defined as:

"Any mathematical model that combines space and time into a single interwoven continuum."⁹⁷

The curvature is visualized in 2-d terms as a massive object distorting the space around it to form a "gravitational well", such as that due to a heavy ball on a trampoline, Fig. 27a. A small object passing in its vicinity is then deflected by the deformation of the surface.

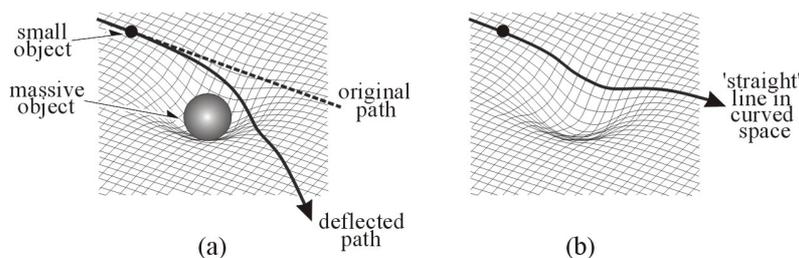


Fig. 27. Curvature.

A 'straight line on a curved surface' would however be that of Fig. 27b. The actual path of of Fig. 27a requires an additional *downward gravitational force* on the small object. But which according to Einstein doesn't exist, gravity being fully represented by the curvature of the surface. The trampoline model thus requires gravity to explain gravity, making it a nonsense.

The same considerations apply to planetary orbits, as in the above:

" The Moon appears to curve as it orbits the Earth, but in reality follows a straight line in curved spacetime."⁹⁸

This is shown in Fig. 0-28a.

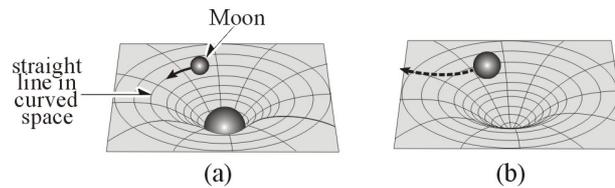


Fig. 0-28. Moon/Earth.

But again, for the Moon to follow the path shown requires a *downward gravitational force*. Otherwise centripetalism would cause it to fly upwards and outwards, Fig. 0-28b. Again, the model requires gravity to explain gravity, making it nonsensical.

Such diagrams are invariably drawn for a *small light body* being deflected by a *large massive one*. How would it look for two binary neutron stars, each forming its own gravitational well, while simultaneously falling down the well caused by the other? This case is normally assiduously avoided.

In spite of such diagrams being regularly trotted out to "explain" the curvature model for gravity, in practice they don't work, i.e. don't represent what actually happens. And are further drawn in terms of 2-d *space*. General Relativity however talks of *curved spacetime*, a mathematical model combining the space and time variables into a "single interwoven continuum"^a – whatever that might mean.

In the present case, 2-d spacetime would comprise two spatial position variables (x,y) and one time variable (t) combined into a single mathematical equation $f(x,y,t)$, representing the 2-d surface^b at all points in time.

Such an equation would evidently be highly complex. But nevertheless feasible. It would however be a *mathematical abstraction*, a set of symbols on a piece of paper. The question then being: how can a concrete physical object like the Moon follow a straight line in a mathematically-curved abstraction?

how can a concrete physical object follow a straight line in a mathematically curved abstraction?

(Another good question! Any takers?)

When physicists "explain" a complex mathematical concept in terms of a simple physical analogy. And one then finds that the analogy simply doesn't make any sense. One starts to wonder whether the same doesn't apply to the original mathematical concept.

Back in 1920 Thomas See was already lamenting:

"One cannot but reflect that astronomical theories were perfected by Newton, Laplace and Besses, before such confusing terms as '4th dimension time-space manifolds' were introduced."⁹⁹

^a p.2.

^b E.g. those of Fig. 27, Fig. 0-28.

On his own admission Einstein couldn't conceive of 'space':

"We entirely shun the vague word 'space', of which – we must honestly acknowledge – we cannot form the slightest conception."¹⁰⁰

How much less the mathematical abstraction 'spacetime'? Cahill:

"Spacetime is merely a mathematical construct with no ontological significance."¹⁰¹

A contemporary blogger asks:

"Are we being taken to the cleaners by spacetime physicists?"¹⁰²

The answer would seem to be a resounding "Yes".

Aether

Returning to the aether, in his 1905 Special Relativity paper Einstein summarily dismissed it:

"The introduction of a 'luminiferous aether' will prove to be superfluous, since the view to be developed here will not introduce an absolute 'stationary space'."^a

But then in his 1920 Leiden address he resoundingly brought it back again:

"Recapitulating, we may say that according to the General Theory of Relativity space is endowed with physical qualities. In this sense there exists an aether. Space without an aether is unthinkable. Not only would there be no propagation of light, but also no standards of space and time. Newtonian action at a distance is only apparent. In truth is conveyed by a medium permeating space."¹⁰³

He tried to slide out of the contradiction by adding:

"This aether may not be thought of as a ponderable media, and the idea of motion may not be applied to it."¹⁰⁴

This however makes no sense. If something "exists and is endowed with physical qualities", it is *by definition* a "ponderable physical object to which the idea of motion can be applied". Einstein goes on to say:

"The aether of the General Theory of Relativity is a medium without mechanical or kinematic properties, that co-determines mechanical and electromagnetic events."¹⁰⁵

This too is meaningless. How can something with no mechanical properties co-determine mechanical events? True to form, Einstein does not explain.

Robert Laughlin^b:

"It is ironic that Einstein's most creative work, the General Theory of Relativity, should boil down to conceptualizing space as a medium, when his original premise was that no such thing exists."¹⁰⁶

All in all, the conceptual basis of General Relativity is about as screwed up and contradictory as its Special counterpart.

^a p.2.

^b Robert Laughlin (1950-), Stanford University, Nobel Laureate in Physics.

Gravitational clock-slowing

Atomic clocks depend on the emission frequency of caesium atoms. Imagine an observer out in deep space with such a clock, and another clock on planet Earth, Fig. 29.

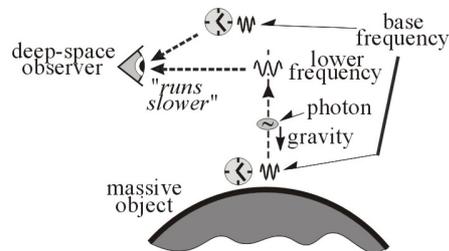


Fig. 29. Gravitational clock-slowing.

Due to their relativistic mass^a, photons are subject to gravity. Consider a photon emitted by the earthbound clock. As it climbs up into space, the gravitational force causes it to *lose energy*, reducing its frequency^{b107}. The deep-space observer then sees the earthbound clock *running slower* than his own. This is *gravitational clock slowing*.

Correspondingly, the speed of light is lower in a gravitational field^c: the so-called *Shapiro effect*.

Photons from a distant star passing close to a massive object, such as the Sun, are then *deflected*, shifting the star's apparent position as in Fig. 30.

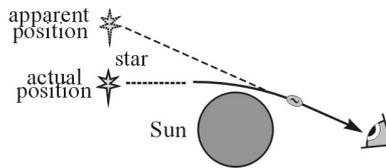


Fig. 30. Gravitational light-deflection.

The idea of gravitational light deflection is however not new. It goes back at least to Newton, who proposed it as a corollary to his corpuscular theory of light, writing in his 1704 *Opticks*:

"Do not bodies act upon light at a distance, and by their action bend its rays?"¹⁰⁸

John Michell^d in 1783, and independently Pierre-Simon Laplace^e in 1795, had both further reasoned that the gravity of some stars could be so strong that light would be unable to escape them. Effectively postulating *black holes*, a concept Einstein never accepted to his dying day even though it is a direct consequence of his own theory. He even wrote an article proving there could be no such thing¹⁰⁹.

The amount of the deflection was first calculated in 1784 by Henry Cavendish^f. He however used a purely Newtonian model that did not take gravitational clock slowing into account¹¹⁰. Correcting for this, *twice* the Newtonian value is obtained.

^a In turn due to their energy, on the $E=mc^2$ principle. .

^b On the $E=h\nu$ principle.

^c Strictly: a gravitational *potential*.

^d John Michell (1724-1793), British clergyman and amateur astronomer.

^e Pierre-Simon Laplace (1749–1827), French mathematician and astronomer, aka "the French Newton".

^f Henry Cavendish (1731–1810), English scientist.

The true amount of a photon's deflection by the Sun thus came to be seen as an experimental test for General Relativity. Due to the Sun's brilliance, the apparent shifts in stars' positions can only be observed during a *solar eclipse*.

There was to be one in May 1919, visible in Sobral in the northeast of Brazil and on the island of Principe off the coast of West Africa. Expeditions to both places were planned by the English Astronomer Royal Sir Watson Dyson^a.

Eclipse show (1)

There is a background to the story. 1917 wartime England had enacted military conscription, and the then 34-year-old Cambridge University astronomer Arthur Eddington^b, a personal friend of Einstein's, was eligible. As a devout Quaker, however, he was a conscientious objector. It was their common pacifism that had originally drawn him and Einstein together.

Current English opinion was strongly opposed to conscientious objectors. It was a social disgrace even to be associated with one. Fearing adverse publicity, Cambridge University approached the Home Office arguing that it was not in the public interest that such a distinguished scientist as Eddington should be conscripted. As a result, and with the personal intervention of Dyson, Eddington was deferred. But with the express stipulation that, should the war have ended by then, he would head the May 1919 solar eclipse expeditions.

It was therefore essential for Dyson, Cambridge University and Eddington personally that the expeditions be deemed a success. The results were announced triumphantly on 6th November 1919 in London at a joint meeting of the *Royal Society* and the *Royal Astronomical Society*, convened solely for the purpose. An eye witness recounts:

"It resembled more a coronation than a scientific conference."¹¹¹

Alfred Whitehead^c was present. He wrote:

"The intense atmosphere was that of a Greek drama. We the audience were the chorus, commenting destiny's decree on a supreme event that was to be revealed. Newton's portrait in the background reminded us that after two centuries the greatest of all scientific generalisations, the theory of gravity, was about to receive its first modification."¹¹²

The paper was however only received by the Royal Society on October 30th, a week before its presentation. And so was unlikely to have been seriously peer-reviewed. The audience was also not shown the original photographic plates. When Charles Poor^d subsequently obtained and analyzed them, he found that *no way* did they substantiate Eddington's claims:

"Of the thirty-three plates showing star images, only seven even approximated Einstein's predictions. And to make these fit, one is forced to invoke the aid of the Sun to distort the camera in a particular way, and by just the right amount."¹¹³

Maurice Allais^e:

"There can be no clearer scientific fraud than what went on in the tropics on May 29, 1919. Eddington was in no way interested in testing Einstein's theory,

^a Watson Dyson (1868-1939), English astronomer.

^b Arthur Eddington (1882-1944), English astronomer.

^c Alfred Whitehead (1861-1947), English philosopher.

^d Charles Poor (1866-1951), American astronomer and Columbia University Professor of Celestial Mechanics.

^e Maurice Allais (1911-2010), French physicist and economics Nobel laureate.

but only in confirming it. He fudged the data correspondingly. Some stars were indeed displaced in the required direction. But others were displaced in a transverse, and still others in the opposite direction to that predicted. Non-conforming data, 85% of the total, were simply discarded as 'due to accidental error'. By a strange coincidence the remaining 15% 'good' data were those consistent with Einstein's theory. This was surely one of the biggest scientific hoaxes of the 20th century. Thanks to this fraud, based on a handful of data points massaged more thoroughly than a side of Kobe beef, Einstein became a world celebrity surrounded by an aura of scientific infallibility."¹¹⁴

In his 1830 book *Reflections on the Decline of Science in England*, Charles Babbage^a described the principal forms of scientific dishonesty:

- *trimming*: smoothing irregularities to make the data look precise
- *cooking*: retaining only those results that fit the theory
- *forging*: inventing some or all of the data, and even reporting experiments that were never performed¹¹⁵

Eddington may not have indulged in forging. But he was no stranger to trimming and cooking.

In fact there seems to be an item missing from Babbage's list. In line with the culinary metaphor we can call it *stewing*:

- *stewing*: hailing as confirming a scientific theory an experiment that refutes it

Examples of scientific stewing we have met so far are the Hafele-Keating experiment and the GPS system. Both are said to resoundingly confirm Special Relativity. In fact they both resoundingly refute it.

In spite of the ample demonstration of the eclipse expedition's fraudulence, however, as late as 1999 the eminent English physicist Stephen Hawking^b could write:

"The curvature of spacetime was confirmed in spectacular fashion in 1919, when light was bent as it passed the Sun giving direct evidence that space and time are warped."¹¹⁶

Wait a minute, Stephen! The results firstly *don't* confirm General Relativity *as such*: the ten coupled hyperbolic-elliptic nonlinear partial differential equations. But only a very minor aspect of it, the deflection of photons by a massive body. And this is equally explained by classical gravitation and gravitational time dilation – ideas that have both effectively been around since Newton's time – without invoking General Relativity at all. Even less do they confirm the 'warping of spacetime', a conceptual nonsense found only in warped minds^c.

To make such a statement, one would have to be either:

- 1) *ignorant*: still unaware of the fraudulence of the eclipse expedition; or
- 2) *mentally challenged*: unable to recognize the nonsensicality of 'warped spacetime'; or
- 3) *bullshitting*: "My profession, right or wrong"

The first two being unlikely in this case, we are left with the third as another example of a famous physicist spewing out bovine excrement, presumably assuming that we-the-rest-of-us will unquestionably swallow it because he is a famous physicist and we aren't.

^a Charles Babbage (1792-1871), Cambridge University mathematics professor and "prophet of the electronic computer".

^b Stephen Hawking (1942– 2018), English physicist and popular author. .

^c p.2.

The last word on gravity, however, has to rest with a busty 1950s Hollywood actress. Asked by a newspaper reporter what kept her frontally-plunging backless strapless evening gown in place, she replied gravely:

"Gravity. The gravity of the situation that would arise if it fell down".

EINSTEIN

Plagiarist

Turning to Einstein himself, the characterizing features of his 1905 Special Relativity are:

- 1) clock-slowng^a
- 2) length contraction^b
- 3) mass increase^c
- 4) 'absolute' Relativity (no 'at rest')^d

Later in the same year he published a further paper on the:

- 5) mass-energy equivalence ($E=mc^2$)

Einstein always insisted that he arrived at his results independently. In fact, however, they had all without exception been previously published, and were available in the scientific literature of the time.

Take first *length contraction*. In 1888 Oliver Heaviside showed from Maxwell's equations that movement through the aether alters electric fields by the Lorentz factor γ ^{e117}. The next year George FitzGerald^f used this, and the *ad hoc* hypothesis that inter-molecular forces are electrostatic, to derive the length contraction relation, thereby explaining the alleged "null result" of the Michelson-Morley experiment:

"The forces binding the molecules of a solid might be modified by motion through the aether such that the base of the interferometer is shortened, neutralizing the optical effect."¹¹⁸

In 1892 Lorentz, independently and more rigorously, arrived at the same conclusion:

"There will be a contraction in the direction of motion proportional to the square of the ratio of the velocities of translation and of light, such as to annul the effect of aether drift in the Michelson-Morley interferometer."¹¹⁹

Whence the name: the "FitzGerald-Lorentz" length contraction.

In 1897 Joseph Larmor^g, again independently¹²⁰, derived the same relation. In the same year he showed that motion through the aether retards physical processes in the same proportion, giving the *clock-slowng* relation:

"Individual electrons describe orbits in times shorter than the 'at rest' system in the FitzGerald length contraction ratio."¹²¹

In 1899 FitzGerald arrived at the same result, as did also Lorentz:

^a eq. 2 (p.2).

^b eq.3 (p.2).

^c eq.4 (p.2).

^d p.2.

^e p.2.

^f George FitzGerald (1851–1901), Irish physicist.

^g Joseph Larmor (1857-1942), Irish physicist.

"The time of vibrations of oscillating electrons in the frame of a moving observer is γ times as great."¹²²

With regard to *mass increase*, J.J. Thompson^a proposed in 1881 that mass increases with velocity¹²³. This was confirmed experimentally for electrons by Walter Kaufmann^b in 1901¹²⁴. In 1904 Lorentz showed mathematically that the factor involved is γ ¹²⁵.

The term "principle of relativity" was first used in 1900 by Henri Poincaré^c. He defined it as:

"The principle according to which the laws of physical phenomena must be the same for a stationary observer as for one carried along in uniform motion."¹²⁶

Einstein's first 'absolute relativity' postulate is a rewording of this. Writing to Poincaré in 1904, Lorentz agreed with him that:

"It would be more satisfactory to show that electromagnetic actions are entirely independent of the motion of the system."¹²⁷

This is again Einstein's first postulate.

In contrast to Einstein, who was apparently congenitally averse to crediting anyone except himself with anything, Lorentz openly attributed the absolute relativity principle to Poincaré:

"I have not established the principle of relativity as universally true. Poincaré, on the other hand, obtained a perfect invariance of the electromagnetic equations and formulated the term 'postulate of relativity', which he was the first to employ."¹²⁸

Lorentz later commented:

"Einstein simply postulated what we had already deduced from the fundamental equations of the electromagnetic field."¹²⁹

In fact the idea of absolute relativity wasn't even Poincaré's. Back in 1763 Roger Boscovich^d had written:

" We cannot obtain an absolute knowledge of local modes of existence, nor yet of absolute distances or magnitudes. Just as it is impossible to transfer a fixed length from one place to another, so with a fixed interval of time."¹³⁰

Turning to the $E=mc^2$ mass/energy equivalence, according to the *en.wikipedia*:

" Einstein is best known for his mass/energy equivalence formula $E=mc^2$, dubbed 'the world's most famous equation'."¹³¹

The July 1946 edition of *Time* magazine carried on its cover a photo of Einstein together with the equation inscribed onto a mushroom cloud¹³².

^a J.J. Thompson (1856–1940), English physicist.

^b Walter Kaufmann (1871-1947), German physicist.

^c Henri Poincaré (1854-1912), French scientist.

^d Roger Boscovich (1711–1767), Croatian polymath.



Fig. 31. $E=mc^2$.

Once again, however, no way was the equation "Einstein's". Newton had already wondered about such an equivalence, writing in his 1704 *Opticks*:

"May not Nature change bodies into light, and light into bodies? She seems delighted with transmutations."¹³³

The quantitative relation was first proposed in 1875, thirty years before Einstein, by Tolver Preston^a:

"Energy is proportional to mass times the speed of light squared."¹³⁴

In 1900 Poincaré derived a "momentum of radiation" that effectively incorporates the $E=mc^2$ relation¹³⁵. Edmond Whittaker^b credits him with its discovery¹³⁶.

In 1903 Olinto dePretto^c derived the relation rigorously and explicitly. But since he published it in a relatively unknown Venetian scientific journal^{d137}, it attracted little attention.

Einstein, however, firstly spoke fluent Italian – his father had moved there for business reasons when he was 15. And more significantly: the parents of his Italian work colleague Michele Besso were close family friends of the Venetian dePrettos¹³⁸ (the plot thickens!).

Resuming, *not one single one* of the ideas in Einstein's 1905 Special Relativity paper was original. All had been previously published. Max Born^e wrote:

"A curious feature of Einstein's 1905 paper is the absence of any reference to Poincaré or anyone else. It gives you the impression of a new venture. But that of course, as I have tried to explain, is not true."¹³⁹

The science historian Keswani:

"As far back as 1895 Poincaré had conjectured the impossibility of detecting absolute motion. In his book *Science and Hypothesis*, published in 1902, he introduced the 'principle of Relativity'. Einstein acknowledged none of this in his unreferenced 1905 paper."¹⁴⁰

Maurice Allais:

^a Tolver Preston (1844–1917), English telegraph engineer.

^b Edmond Whittaker (1873-1956), English science historian.

^c Olinto dePretto (1857–1921), Italian engineer/industrialist and physicist.

^d De Pretto presented two papers, both in Venice, in June and November 1903. The second was published in the proceedings of the Venetian Royal Institute of Science, Literature and Art in February 1904.

^e Max Born (1882–1970), German physicist, co-winner of the 1954 physics Nobel Prize and a personal friend of Einstein's.

"It is now time to speak directly of what Einstein was: first and foremost a plagiarist who had few qualms about stealing the work of others and submitting it as his own. Poincaré wrote 30 books and over 500 papers on philosophy, mathematics and physics. Einstein claimed he'd never read any of them. Yet many of Poincaré's ideas wound up in his 1905 paper, without being credited."¹⁴¹

Brian Ruhe:

"The only original part of Einstein's 1905 paper was its title. Everything else was plagiarized."¹⁴²

Noting that Einstein himself once said:

"The secret to creativity is knowing how to hide your sources."¹⁴³

And that towards the end of his life admitted to:

"Having been an unscrupulous opportunist."¹⁴⁴

Mileva effect

In 1903 Einstein married Mileva Marić^{ab}, a Serbian fellow student at the Zurich ETH (Federal Polytechnic). They already had an out-of-wedlock daughter, Lieserl, whose fate is unknown. She is believed to have died in 1903. Einstein never mentioned her publicly.

Both families objected strongly to the marriage. Mileva's because Albert was bookish and Jewish. Albert's because Mileva was bookish and not Jewish. But they married anyway and had two more children: Hans Albert who became a university professor in California and had little subsequent contact with his father. And Edward who suffered from schizophrenia and spent most of his life in mental asylums.

A short technical diversion. Certain metals and gases "ionize", i.e. emit electrons, when light falls onto them – the so-called *photoelectric effect*. It had originally been observed in 1888 by Heinrich Hertz^c, who was also the first to demonstrate experimentally the electromagnetic waves predicted by Maxwell. The unit of frequency, the "Hertz", is named after him.

The photo-electric effect was subsequently studied in depth by Philipp Lenard^d as part of his work on cathode rays. for this he received the 1905 physics Nobel Prize.

Related to the photoelectric effect is *black body radiation*. The hotter a body is, the lighter its colour, i.e. the higher the frequency of its emitted radiation. The current theory could not, however, explain the respective frequency spectrum.

The problem was finally solved in 1900 by Max Planck. He made the heuristic – and as it turned out brilliantly intuitive – proposal that matter consists of "material oscillators"^e that emit light not continuously, but in *discrete packets* that he called "*quanta*"^f of action".

Scientists in general are a conservative lot, and since Planck's theory had broken all the accepted rules, it was definitely not well received by the scientific establishment. Planck even came to be regarded as bit of a crank, which then as now was an effective death warrant for one's academic career.

So when in March 1905 an unknown young patent clerk from Bern named A. Einstein submitted to the German scientific journal *Annalen der Physik*, of which Planck happened to be an editor, a paper explaining the photo-electric effect in terms of Planck's *quanta*, it

^a Official name: Marity.

^b Mileva Marić (1875–1948).

^c Heinrich Hertz (1857–1894), German physicist.

^d Philipp Lenard (1862–1947), German physicist.

^e Later identified as atoms.

^f 'Quantity' in Greek.

was obviously immediately accepted. And Planck became eternally indebted to Einstein for having vindicated his theory and salvaged his career. Freud noted that most of us can handle aggression, but are defenceless in the face of flattery.

And so when in June of that same year that same A. Einstein submitted to that same journal a further paper entitled *On the Electrodynamics of Moving Bodies*, in spite of its manifest ambiguities and lack of references to any other author, it too was immediately accepted.

A further detail. As part of her ETH course Mileva had spent a semester on her own in Germany at Heidelberg University studying the photoelectric effect under Philipp Lenard, by then its principal exponent. So whereas Albert had little cause to be interested in the photoelectric effect, Mileva definitely did, and one suspects that the respective paper was in fact essentially hers. Noting that contrary to Albert's custom, this paper *did* contain references, including two to Planck and one to Lenard.

When a couple marry under Swiss law, each can opt to join the two surnames to form a joint *Allianzname*. Mileva chose to do this, and from then on was officially "Mileva Einstein-Marity". Albert did not, remaining plain "Albert Einstein". He is never known to have signed himself "Einstein-Marity"¹⁴⁵.

In 1905 Abraham Joffe^a was assistant to Wilhelm Röntgen^b, the discoverer of X-rays, for which he received the first-ever Nobel prize for physics in 1901. Röntgen at the time was an editor of the *Annalen der Physik*. By virtue of which Joffe got to see the original manuscript (long since disappeared) of the 1905 Special Relativity paper. He remembers that it was signed "Einstein-Marity", i.e. with *Mileva's* surname rather than Albert's¹⁴⁶.

In 1905 Mileva wrote to friend:

"We have recently completed a very important work, which will make my husband world-famous."¹⁴⁷

Albert wrote to her:

"How happy and proud I will be when we two together have victoriously led our work on relative motion to an end!"¹⁴⁸

There are therefore considerable grounds for suspecting that not only the photoelectric effect paper, but also the one on Special Relativity, was at least in good part due to Mileva.

Further indications are that the divorce agreement stipulated that should Einstein ever win a Nobel prize, the monies were to be paid over to Mileva. Remembering that he got the prize for the photo-electric effect, and not for Relativity.

And that when Mileva once hinted that she was thinking of publishing her memoirs, Einstein advised her in an extant letter to "Keep your mouth shut"¹⁴⁹.

Einstein's last original work was his 1915 General Relativity. From then on till his death in 1955 he produced virtually nothing of any significance. He and Mileva split up in 1916. Without Mileva, it seems, "Albert's" scientific creativity ground to a halt.

There is obviously no conclusive proof that the true author of the 1905 papers was Mileva. But there is also none that it was Albert. The evidence is circumstantial: each makes of it what he may. Noting that much of this circumstantial evidence points to Mileva.

Eclipse Show (2)

For the first two years after its publication Einstein's 1905 paper received little attention. But then in 1907 Hermann Minkowski used it for his 'spacetime' concept^c. It was

^a Abraham Joffe (1880–1960), Russian physicist.

^b Wilhelm Röntgen (1845–1923), German physicist.

^c p.2.

largely thanks to Minkowski's promotion of his own idea that Einstein's work became more widely known – although still only among a relatively small circle of theoretical physicists. Had one used the term "relativity theory" before 1919, it would have been taken to refer to that of Lorentz and Poincaré, and not to Einstein's¹⁵⁰.

But then came the 1919 Royal Society Eclipse Show^a which:

"Began an 'Einstein frenzy' of praise and adulation in the world press that would last for months, and would give Albert a divine greater-than-life image."¹⁵¹

Christopher Bjerknes^b, in his massively researched *The Manufacture and Sale of Saint Einstein* with more than 3600 references, calls the event the "Canonization of Saint Einstein". The *London Times* of 7th Nov. 1919 carried the headline:

"Revolution in Science. New Theory of the Universe. Newtonian Ideas Overthrown."

The article cited the President of the Royal Society Sir J.J.Thompson as having called it:

"One of the most momentous, if not *the* most momentous, pronouncements of human thought."¹⁵²

Adding however that:

"He had to confess that no one had really yet succeeded in stating in clear language just what Einstein's theory is."¹⁵³

So no-one really knew what General Relativity was. But everyone agreed that it had been resoundingly confirmed. The *New York Times* of 9th Nov. similarly headlined:

"ECLIPSE SHOWED GRAVITY VARIATION. British Scientist Calls Discovery One of the Greatest of Human Achievements"

Again, however, noting that:

"Efforts to put Einstein's theory into words intelligible to the non-scientific public have so far not been very successful."¹⁵⁴

The *Times* article was copied by newspapers all over the world. Einstein awoke in Berlin on the morning of November 7, 1919 to find himself a world-famous celebrity. For the rest of his life would remain the world's most famous scientist. And General Relativity would remain a fascinating, but puzzling, subject that most people believed they could never understand¹⁵⁵. The relatively few dissenting voices evidently got submerged in the generalized Einstein frenzy.

Zionism

Apart from being an ardent pacifist, Einstein was an ardent Zionist. A somewhat contradictory combination, given that Zionism is not notoriously pacific. But Albert was no stranger to contradiction.

His new-found fame was siezed upon by the Jewish press as a way of furthering the Zionist cause¹⁵⁶. A certain Alexander Moszkowski^c in particular, a career sycophant, made promoting Einstein his life's work. He wrote to him:

^a p.2.

^b Christopher Bjerknes (1965-), American Science historian.

^c Alexander Moszkowski (1851–1934), Polish writer and journalist.

"Regardless of what happens, I would like to continue the 'cult'. For you it is secondary, but for me it is paramount. Additionally, my modest writing abilities may serve the Zionist cause."¹⁵⁷

Subsequent to the Nov.1919 Eclipse Show Paul Ehrenfest^a wrote to Einstein:

"I hear that your accomplishments are being used to make propoganda for a 'Jewish Newton', who is simultaneously an ardent Zionist."¹⁵⁸

As did also Max Born's father-in-law:

"It uplifts the heart and strengthens one's faith in mankind to see the researchers of all nations prostrating themselves before a man of Jewish blood who thinks and writes in German, in full recognition of his greatness."¹⁵⁹

USA visit

In the spring of 1921, Einstein together with the Zionist leader and future first President of Israel Chaim Weizmann^b made his first visit to the USA. The objective of the journey was to raise funds for the Hebrew University in Jerusalem. Einstein jokingly called it "Dollaria".

On their way over Einstein tried to explain General Relativity to Weizmann. Asked later whether he had understood it, Weizman said:

"Einstein explained it to me every day. By the time we arrived I was convinced that he really understands it."¹⁶⁰

According a contemporary description^{c161}: When the ship docked in Lower Manhattan on the afternoon of April 2, Einstein was standing on the deck wearing a black felt hat that concealed some but not all of his now-graying profusion of uncombed hair. One hand held a shiny briar pipe. The other clutched a worn violin case:

"He looked like an artist", the *New York Times* reported, "But underneath the shaggy locks was a scientific mind whose deductions have staggered the ablest intellects of Europe."¹⁶²

Thousands of spectators, along with the fife-and-drum corps of the Jewish Legion, were waiting when the mayor and other dignitaries brought Einstein ashore on a police tugboat. The crowd waved blue-and-white flags, and sang 'The Star-Spangled Banner' and the Zionist anthem '*Hatikvah*'.

Einstein and Weizmann had intended to head directly for their hotel. But instead they were taken on a motorcade that wound through the Jewish neighborhoods of the Lower East Side late into the evening:

"Every car had its horn, and every horn was put into action", Weizmann recalled. "We reached the hotel at about 11:30 p.m, tired, hungry, thirsty, and completely dazed."¹⁶³

During the visit Einstein and Weizmann were wildly embraced, especially by the less assimilated and more enthusiastic Jews who tended to live in Brooklyn or on the Lower East Side, rather than on Park Avenue. At one event more than 20'000 people showed up "Causing a near riot when they stormed the police lines", the *Times* reported.

After three weeks of lectures and receptions in New York, Einstein and Weizmann visited Washington. Where for reasons fathomable only to those who live in that city, the

^a Paul Ehrenfest (1888–1933), Austrian physicist, later professor of theoretical physics at Leiden University.

^b Chaim Weizmann (1874–1952), Zionist leader and future first President of Israel.

^c With acknowledgements and thanks.

Senate decided to debate the Theory of Relativity. When a House side Representative proposed placing Einstein's theories on the Congressional Record, another rose to ask:

- "Did the Honorable Representative understand the theory?".
- "I have been earnestly busy with it for three weeks." was the reply, "And I am beginning to see some light."
- "But what relevance does it have to the business of Congress?", the first insisted.
- "It may bear upon future legislation concerning general relations with the cosmos",¹⁶⁴ was the answer.

When Einstein visited the White House, it was therefore inevitable that the President Warren G. Harding would be asked whether he understood Relativity. As the group posed for the cameras, the President smiled and confessed that he did not.

"Einstein's Idea Puzzles Harding"¹⁶⁵

ran the following day's *New York Times* front-page headline.

Einstein and Weizmann subsequently visited Princeton, where Einstein delivered a week-long series of lectures and received an honorary degree. The lectures were very technical, and included more than 125 complex mathematical equations which Einstein scribbled on the blackboard while explaining them in German. One student admitted:

"I sat up in the balcony. But even so he talked way over my head"¹⁶⁶

One of the final stops on the grand tour was Cleveland, where several thousands thronged the train depot to meet the visiting delegation. The parade included 200 honking flag-draped cars. Einstein and Weizmann rode in an open car, preceded by a National Guard marching band and a cadre of Jewish war veterans in uniform. Admirers along the way grabbed onto Einstein's car, jumping on the running board while police tried to pull them away.

Back in Europe, Einstein confessed to being amused and baffled by America. He wrote to Michele Besso:

"It is more easily aroused to enthusiasm than other countries I have unsettled with my presence. I had to let myself be shown around like a prize ox. It's a miracle that I endured it. But what remains is the fine feeling of having done something truly good for the Jewish cause."¹⁶⁷

As a fund-raiser the trip was only a modest success. The poorer Jews and recent immigrants had donated with enthusiasm. But few of the established old-line Jews with great personal fortunes had joined the frenzy. Only \$750'000 was collected, far less than the \$4 million hoped for. But it was a good start. Einstein wrote to Ehrenfest.

"The Hebrew University seems financially secured"¹⁶⁸

There is a sequel. Politically Einstein was decidedly left-wing, for instance writing:

"The real evil is the economic anarchy of capitalism, a huge community of producers unceasingly striving to deprive each other of the fruits of their labor – not by force, but in faithful compliance with legally established rules. The only way to eliminate this is a socialist economy with an educational system oriented toward social goals."¹⁶⁹

The FBI had a 1'427 page file on him. It had recommended that he be barred from immigration to the US under the Alien Exclusion Act, alleging with characteristic paranoia that:

"He believes in, advises, advocates, or teaches a doctrine which would allow anarchy to stalk unmolested, resulting in government in name only."¹⁷⁰

So when in December 1932 Einstein applied for a US visa, many protested and it was refused. The board of the National Patriotic Council termed him:

"A German Bolshevik whose theory has no scientific value, and is not understandable because there is nothing there to understand."¹⁷¹

And the American Women's Patriotic Association likewise warned that he was an undesirable alien.

In the end Einstein got his visa, chuckling over the fact that:

"The sentries of America had not given heed to the wise patriotic ladies, apparently forgetting that the Capitol of mighty Rome was once saved by the cackling of its faithful geese."¹⁷²

Great Relativity Battle

While Einstein was being publicly hailed as a genius and one of the greatest minds of all time, the scientific community was not quite so sure. There were those who disagreed with the theory as such – we have noted Heaviside, Rutherford, Soddy and Tesla^a. Albert Michelson also never accepted Special Relativity, as he once politely admitted to Einstein when they met¹⁷³. Neither did Max Born, Ernst Mach, Henri Poincaré, Charles Poor, Hendrik Lorentz, Wolfgang Pauli and John Bell, among many famous others. A May 1921 *Minneapolis Morning Tribune* article ran:

"The scientific world has lately been much entertained, and somewhat mystified, by the increasing doubts which have gradually crept into the press regarding both the authenticity and the reliability of Professor Einstein's much-vaunted Theory of Relativity. Professor Arvid Reuterdaahl of St. Thomas College has challenged Professor Einstein to a written debate on the latter's theory, but has so far only been met with more or less evasive statements by Professor Einstein, some of which appear to be simply irreconcilable."¹⁷⁴

Then there were those outraged at his plagiarism, especially after he got a Nobel prize¹⁷⁵. This had been instituted by Alfred Nobel^b, a Swedish chemist and armaments manufacturer – among other things the inventor of dynamite. As a practical man, Nobel had decreed that the physics prize be awarded for *experimental* discoveries.

The photoelectric effect law was first confirmed experimentally in 1914 by Robert Millikan^c, who was slated to receive the 1921 Nobel Prize for it. So when the prize went to Einstein for, as the Awards Committee phrased it:

"His services to theoretical physics, and especially for the discovery of the law of the photoelectric effect."¹⁷⁶

this was in direct contravention of Nobel's directives. Einstein had made no experimental discovery. In fact once he left the ETH he never did a single scientific experiment for the rest of his life. Bjerknes:

"It was obvious that Einstein was given the Nobel prize, not because he deserved it, but because certain influential persons [for which read 'Max Planck'] had insisted on it."¹⁷⁷

That the 1921 prize was only awarded in the following year of 1922 further indicates the controversy surrounding it. Einstein at the time was on his way to Kyoto, Japan to deliver a talk entitled "How I created the Theory of Relativity" (excess modesty was never one of his faults!). On his return the Swedish ambassador delivered the prize cheque,

^a p.2.

^b Alfred Nobel (1833–1896), Swedish chemist and armaments manufacturer.

^c Robert Millikan (1868–1953), American physicist.

medal and certificate to him discreetly in private, again pointing to a certain embarrassment over the issue.

The Swedish academic Arvid Reuterdaahl (1876–1933) called Einstein:

"The P.T. Barnum^a of the scientific world, basking in the circus limelight he focused on himself. Never before in the world of Science has a hero been so quickly and cleverly manufactured from plagiarism, false data and sophistry. Never before has intellectual opposition to the absurd been so effectively suppressed by race-baiting and brow-beating as was done by Einstein and his cronies. Deliberately and in the knowledge of the historical forces at play, and how they might be manipulated to fit the desired purpose."¹⁷⁸

In a May 1923 article in the *San Francisco Journal*, Thomas See called Einstein "A Second Dr. Cook". Bjerknes again:

"In the early 1920s Einstein's plagiarism became an international scandal, with some calling for the revocation of his Nobel Prize. He acted like a teenager who copies an article from an encyclopedia, changes a few words, and then submits the finished forgery as his own work. But many Jewish owned newspapers, avoiding the legitimate criticisms leveled at him, resorted to *ad hominem* attacks against his critics, calling anyone who dared speak a word against him an anti-Semite."¹⁷⁹

In a widely commented speech in April 1929, the archbishop of Boston Cardinal William O'Connell^b denounced Einstein's theories as:

"Authentic atheism camouflaged as cosmic pantheism."¹⁸⁰

Throughout the 1920s the Great Relativity Battle raged on. With "idealist" anti-relativists maintaining that in spite of Einstein's undeniable public image, his ludicrously incoherent theory simply could not be admitted. And "pragmatic" relativists holding that the lucrative spinoffs in terms of increased status and funding for the physics community offered by the Einstein bandwagon simply could not be refused.

In what ultimately became a witch-hunt – and as normally seems to happen in such cases – the pragmatists won out. In spite of its manifold contradictions and incoherencies, Special Relativity was adopted by Mainstream Physics as an official dogma.

In Germany, for instance, the 1922 Annual Congress of the *Gesellschaft Deutscher Naturforscher und Ärzte*^c resolved that thenceforth:

"No criticism of Relativity would be admitted, either in scientific journals or in congress papers"¹⁸¹

Evidently not a particularly "scientific" standpoint! An American physicist recounts:

"While I was working for my Ph.D. at the University of California in the late 1920s, physics departments were being purged of Relativity critics. Those who refused to change their minds were ordered to resign. Those who would not were fired on charges of anti-semitism. The reason given was to present a united front before grant-giving agencies, the better to obtain maximal funds. There has been a particularly vicious attitude towards critics of Einsteinian Relativity at U.C. Berkeley ever since."¹⁸²

More recently Robert Crease^a argued:

^a A famous circus promoter.

^b William O'Connell (1859–1944). Famous for authorizing his priests to refuse communion to women wearing lipstick.

^c *Society of German Scientific Researchers and Doctors*.

"It would be unscientific to suspend Einstein's theory because of a single contrary experiment, since this would allow anti-scientific ideologues – e.g. Soviet scientists – to stop progress through falsification."¹⁸³

This again is hardly "scientific". Especially since Einstein himself had declared that a single contrary experiment could prove him wrong^b. Walter Babin^c:

"Today Relativity Theory can no longer be discussed objectively. Science majors are brainwashed into accepting it. Career scientists must pledge allegiance to it as American presidential candidates must pledge allegiance to Israel. Even constructive criticism of Relativity is interpreted as an attack on Jews. Experimental results that allegedly support the theory are celebrated and applauded. Those that contradict it are suppressed, attacked, smeared or ignored. This is not Science. It is rough hard-nose politics."¹⁸⁴

Louis Essen:

"Students are told that they cannot expect to understand Relativity. It must be accepted. Right at the beginning of their careers they are encouraged to forsake science in favour of dogma. Since the time of Einstein there has been a great increase in anti-rational thought. The Theory of Relativity is so rigidly held that a young scientist with any regard for his career dare not openly express his doubts"¹⁸⁵

Reginald Cahill:

"For a considerable time physics has been in a state of extreme censorship. Einstein has replaced Newton as the monarch of physics. All discussions of the experimental detections of absolute motion^d over the last 100 years are now banned from mainstream physics publications."¹⁸⁶

Al Kelly:

"There is no fair balanced debate on Special Relativity. But two armies lined up against each other like a pair of drunks, neither of whom listens to the other."¹⁸⁷

Rochus Boerner^e:

"Textbooks present science as a noble search for truth in which progress depends on questioning established ideas. This is a cruel myth. Scientists know from bitter experience that disagreeing with the dominant view is dangerous. When research threatens a powerful interest group – government, industry or professional body – its representatives attack the critic's ideas or him personally: censoring publications, denying appointments or promotions, withdrawing research grants, taking legal actions, harassing, blacklisting and spreading rumors."¹⁸⁸

Bryan Wallace:

"Modern theoretical physics has become little more than an elaborate farce. President Eisenhower said that 'In holding scientific research and discovery in

^a Robert Crease (1953–), US science historian.

^b p.2.

^c Walter Babin (1934–), Canadian science researcher.

^d Through the aether.

^e Rochus Boerner (??), freelance journalist.

respect, as we should, we must also be alert to the equal and opposite danger of public policy becoming the captive of a scientific-technological elite'.¹⁸⁹

What Eisenhower feared has happened. Robert Jahn^a:

"At the dawn of the 21st century we find a smugly contented Scientific Establishment, a High Priesthood of Science. This 'New Inquisition' consists not of cardinals and popes. But of the editors and peer reviewers of scientific journals who determine what will and what will not be published. And of governmental agencies that decide what will and what will not be funded."¹⁹⁰

Michael Suede^b:

"Scientists are so emotionally and monetarily locked in to Einstein's theories that they cannot give them up. The future will see ever more insane explanations of the experimental results, a craziness that will accelerate till the whole house of cards finally collapses^c. Scientists are a bunch of thieving fraudsters, defrauding the public by putting forward theories they know observations refute."¹⁹¹

Erwin Schrodinger^d once said:

"The scientist only imposes two things, namely truth and sincerity. He imposes them upon himself, and upon other scientists."¹⁹²

Er ... could you say that again, please, Erwin? Just to make sure we heard you aright.

2+2=5

Modern Relativity physics has painted itself into a corner. Privately it must know that SR is wrong – all those highly-qualified physicists can't be *that* stupid! But to openly admit it would be a public relations catastrophe.

The "Einstein was a genius and Relativity is a pinnacle of human thought" charade has to be maintained at all costs, and for as long as possible. Knowing full well that the truth will one day out. But please: let it be tomorrow after we have collected our salaries and research grants, and not today.

A Caltech astronomer was once asked by his mother what he thought about as he gazed out through his telescope into the profoundest depths of the starry heavens:

"Funding", was his one-word reply¹⁹³.

A thought exercise. Imagine that I am a first year mathematics student. And that the lecturer writes up on the board "2+2=5".

– "But Sir!" I say timidly, raising my hand, "To my way of thinking – which could of course be wrong – 2+2=4."

– "Aha!", says the lecturer, "That is a very good point and I am glad you made it. I fully agree that on first sight it might seem to be so. But this in fact is a highly complex question involving mathematical epistemology, transcendent number theory and non-commutable functions, to name but a few. Look: for the moment simply accept that 2+2=5, and later you will find out why."

Well, he is the lecturer and I am a humble first year student. What can I say? Since none of my classmates seem to be having any trouble with the idea, I make a mental

^a Robert Jahn (1931–), Dean of the Princeton School of Engineering.

^b Michael Suede (??), Austrian economist.

^c Cf p.2.

^d Erwin Schrodinger (1887–1961), Austrian quantum physicist.

note to sign up for that course in mathematical epistemology, and get my nose back down to copying off the blackboard.

Time goes by. I finish my course; start doing research; and to make ends meet take on some part-time teaching. And suddenly here am I one day teaching a first year mathematics class. When I get to the bit where one writes up on the board " $2+2=5$ ", and a student raises his hand and says timidly:

– "But Sir! To my way of thinking – which could of course be wrong ... "

Well ... to tell you the truth, what with course work, seminars, exams, part-time teaching, etc. I never did get around to doing that course in mathematical epistemology. And having heard in the meantime that anyone who questions whether in fact $2+2=5$ could have trouble getting tenure ... and since in the current political climate academic jobs are not so easily come by ... and what with my wife now expecting our first baby ... well, just to be on the safe side I say:

– " Aha! That is a very good point and I am glad you made it. I fully agree that on first sight ... ".

And so it goes on, from mathematical generation to mathematical generation. As Joseph Goebbels^a was wont to say:

"A lie repeated often enough becomes a truth."

A modern Internet blogger has reformulated this as:

"The odour of bullshit, repeated to the limit of infinity, asymptotically approaches that of roses."¹⁹⁴

The mind

Einstein was evidently a complex personality, to put it mildly. He was firstly *dyslexic*, a condition also called "word blindness" that normally manifests as an early reading difficulty. Einstein was twelve before he could read and write adequately¹⁹⁵.

Dyslexia is fairly common: 10% of the population have it to some degree and 3% severely. The dyslexic brain functions *visually*, linking a written word with another visual image. In the sentence "The cat sat on the mat", for instance, the words "cat", "sat" and "mat" have associated visual images, and cause no problem.

But on encountering the little word "the", the brain searches for a visualisable physical correlate. And finding none goes into a flat spin. The rest of the sentence is then simply not perceived. A small girl with dyslexia once complained that when she tried to read:

"The words crawl off the page and hide under the carpet"¹⁹⁶.

Objectively of course they don't – i.e. others in general would not agree that they do. But having a dyslexic step-daughter myself, I have little doubt that – subjectively and experientially – this small girl's words did.

By the time they reach their teens most dyslexics have developed strategies to overcome their disability – more a "difference" than a deficiency. But their brains continue to function visually and intuitively, rather than verbally and rationally.

Dyslexics being less susceptible to language, they are also less subject to the *pressures* that societies exert on their members via language, and thus tend to be *more creative* than the norm. Leonardo da Vinci, Michael Faraday, Thomas Edison, Pablo Picasso, Andy Warhol, and loads of famous others were all dyslexic.

For the same reason dyslexics are typically *less conformist*. Einstein's rebelliousness was legendary. At his Munich high-school where he felt victimized by a harsh Prussian-style educational system, he treated the school and its teachers with disdain¹⁹⁷:

^a Joseph Goebbels (1897–1945), Nazi propaganda minister.

"Einstein. You sit there at the back smiling", one of them complained. "That violates the feeling of respect that a teacher needs from his class"¹⁹⁸

Heinrich Weber, one of his ETH professors, told him:

"You are a smart boy, Einstein. But you have one fault. You do not let yourself be told anything."¹⁹⁹

Einstein himself was later to say:

"He who joyfully marches to the music in rank and file has already earned my contempt. He has been given a large brain by mistake. For him a spinal cord would suffice. Unthinking respect for authority is the greatest enemy of truth."²⁰⁰

In the same vein:

"Great spirits have always encountered violent opposition from mediocre minds, incapable of understanding the man who refuses to bow blindly to conventional prejudices, but expresses his opinions honestly and courageously. Few people are capable of expressing opinions differing from those of their social environment. Most are even incapable of forming such opinions. Two things are infinite: the universe and human stupidity. And I'm not sure about the universe."²⁰¹

And :

"The difference between genius and stupidity is that genius has its limits."⁰

Later in his life he said of himself:

"To punish me for my contempt of authority, Fate made me one."²⁰²

Apart from being dyslexic, Einstein also seems to have been *mildly autistic*, a condition known as "Asperger's syndrome". It is characterized principally by *deficient social interaction*. Autistics have difficulty in interpreting the non-verbal communication of others – facial expressions, gestures, etc. They don't have a "theory of mind", i.e. they don't attribute intentions, thoughts, feelings, etc. to others. Consequently they have *little empathy* and tend to be *solitary*, living in their own little worlds.

As children they are typically introverted, learn to talk late, use few words, laugh and cry little, and focus in on a few interests. In the more severe cases they can show restricted repetitive patterns of behaviour, and also sudden destructive temper tantrums.²⁰³

As adults they tend to disregard social conventions, for instance using old worn clothes. Being insensitive to body language, they take verbal language literally and have difficulty in recognizing metaphor and irony. And so have little sense of humour.

In a few cases they can have unusual mental abilities, such as a photographic ('eidetic') memory. Such a person will "read" a 300 page book in a few minutes, photocopying it into his brain. Asked how the third paragraph on page 273 starts, he can tell you. But asked what the book is about, he hasn't the first idea.

And some can perform phenomenal arithmetical calculations in their heads. Asked to multiply 12345 by 6789, the person will say "Umm... 83'810'205", the correct answer. Asked how he did it, he might say (I once saw someone like this on telly):

"Numbers appear before my eyes. Then comes one with a different shape, or maybe a different colour. That is the one."

A small pocket calculator can readily do such a calculation. And so also can evidently a 100bn-neurone human brain. But not in the standard verbal/rational way: "9 times 5 makes 45; put 5 down and carry 4; etc.". The autistic brain performs the calculation

unconsciously, i.e. non-verbally. And then presents its answer to consciousness in the standard language of the unconscious, which is visual image.

Not all autistics evidently exhibit all its symptoms, especially in the milder cases. Einstein for instance had an excellent sense of humour. But he showed a number of its other characteristics.

As a child he was solitary, preferring building card houses^a by himself to playing with other children²⁰⁴. He didn't start talking till he was three. And then seldom and very slowly. He would mutter sentences repetitively to himself under his breath, to the extent that his parents and teachers suspected he could be mentally retarded. He only became fluent in spoken German at the age of nine²⁰⁵.

He was also subject to sudden attacks of rage. His elder sister Maja wrote in her biography of him:

"The usually calm small boy had inherited from his maternal grandfather a tendency toward violent temper tantrums. His face would turn yellow, the tip of his nose snow white, and he was no longer in control of himself. On one occasion he grabbed a chair and struck his violin teacher, who ran away terrified and was never seen again. Another time he threw a bowling ball at his little sister's head; and once knocked a hole in it with a child's hoe."²⁰⁶

At school he was considered lazy, sloppy, insubordinate and a slow learner. One of his Munich high-school teachers famously told him:

"Einstein. You will never amount to anything"²⁰⁷

His ETH maths teacher Hermann Minkowski scornfully called him a "lazy dog"²⁰⁸.

Einstein later told a friend:

"Being the only Jewish child in the school made it easier for me to isolate myself from the rest, and find comfort in the solitude that I so cherished."²⁰⁹

He wrote:

"The essence of being a man of my type lies in how and of what he thinks; not in what he does or suffers. I am a solitary traveller. I never felt I belonged to my country, house, friends or even family. My passionate sense of social justice has always contrasted oddly with my lack of need for direct contact with other human beings."²¹⁰

But also:

"Although I am a typical loner in daily life, my consciousness of belonging to the invisible community of those who strive for truth, beauty and justice has preserved me from feeling isolated."²¹¹

His sartorial unconcern was legendary. He minimized his wardrobe so as not to waste time deciding what to wear²¹². Asked why he didn't use socks, he said:

"When I was young I found that the big toe always ends up making a hole. So I stopped wearing them. What's the use of socks? They only make holes."²¹³

He didn't brush his teeth, alleging that:

"Pigs' bristles can drill through diamond. So how should my teeth stand up to them?"²¹⁴

Bjerknes recounts that during his visit to the USA:

^a Cf his image of Relativity "collapsing like a house of cards" (p.2).

"He was invited to dinner at an exclusive Los Angeles town house to meet the local writers. Apparently missing the cloakroom on arrival, he appeared in the dining room before the assembled guests in his 'humble' black overcoat and much-worn hat. In a scene worthy of Chaplin he removed his overcoat, folded it neatly and laid it on the floor in a vacant corner. Setting his hat on top of it, he was ready to be presented to the literary elite of Southern California."²¹⁵

On another occasion he dropped a saliva-saturated cigar butt into the dust. And then unashamedly picked it up and put it back into his mouth again, declaring;

"I don't care a straw for germs."²¹⁶

A further consequence of his autistic lack of social sense was his inability to adapt to an audience. In June 1930 in the USA he spoke to an assembly of 4'000 conference delegates "as if they were a physics class"²¹⁷. The following day's *New York Times* headline ran:

"4'000 BEWILDERED AS EINSTEIN SPEAKS".

It said in the article:

"He sometimes gestured with his hands, as if to indicate how clear and obvious his reasoning was. Occasionally he would look up from his paper and smile upon his intent hearers, seeming to assume that they were grasping everything he was saying."²¹⁸

Although publicly renowned for his intelligence, to those who knew him personally he rather came across as slow-witted. A July 1924 *New York Times* article entitled "EINSTEIN COUNTED WRONG" ran:

"After counting hurriedly the change the street-car conductor had given him, Einstein insisted that it was wrong. The conductor recounted it deliberately, explaining to Herr Einstein that it was correct. Then, turning to the next passenger, he said with a shrug of his shoulders 'His arithmetic is weak'."²¹⁹

Of those who graduated in his ETH class, Einstein had the lowest average grade²²⁰. His maths teacher Hermann Minkowski considered him too a poor mathematician to have written the 1905 Special Relativity paper^{221a}. After meeting him for the first time, Max von Laue wrote:

"I did not believe the young man I met to be capable of being the father of Relativity."²²²

Einstein wrote in a letter to Paul Hertz in 1915^b:

"Elliptic geometry escapes me. You don't have the faintest idea of what I, a mathematical ignoramus, went through when writing my last paper"^c.²²³

He was noted for his vacant eyes and air of childlike naivete. On his arrival in America in 1921 the *New York Times* wrote:

"Under a high broad forehead he had large luminous eyes, almost childlike in their simplicity and unworldliness."²²⁴

Charles Nordmann^d who chauffeured him around France less charitably called him:

^a More evidence for the Mileva effect.

^b Just after finishing General Relativity.

^c On General Relativity.

^d Charles Nordmann (1881–1940), French astronomer.

"A vacant-eyed simian clod."²²⁵

Before their USA trip, the secretary general of the World Zionist Organization Kurt Blumenfeld^a warned Weizmann not to let Einstein make speeches on behalf of Zionism, since:

"He is a poor speaker, and often says things out of naiveté that are unwelcome to us."²²⁶

He was also notoriously inadequate at defending his own theories. To provide him with an opportunity to answer his many critics, in Sept. 1920 a discussion on Relativity was included in the 86th congress of the *Arbeitsgemeinschaft Deutscher Naturforscher*^b in Bad Nauheim, Germany, to be chaired by Max Planck.

The event was widely publicized. And Einstein had further let it be known that his critics in general, and Philipp Lenard in particular, would be resoundingly humiliated.

Thousands turned up expectantly. Armed police were present at the door, allegedly to maintain the peace. But in fact to attempt to exclude Relativity dissenters and stack the audience with pro-Einsteiners. When this was realized a tumult ensued outside the hall, and many anti-relativists stormed it.

The conference day began at 09:00 a.m. with a long and boring series of lectures by Einstein and his colleagues. Only at 12:45 did a bell sound to announce the start of the main proceedings. Lenard was the first to question Einstein – who within a short time had become flustered, could not give cogent replies, and had been made to look foolish.

At 13:00, after only few minutes of proper debate, Max Planck announced the lunch break. Shortly before it ended Einstein slipped out of a back door "taking French leave" as they say in my native England^c, and was not seen again at the congress²²⁷.

This was not the only occasion on which he fled his critics²²⁸. All of which heightens the suspicion that Mileva was the real author of "his" theories.

In spite of which, Einstein later had the effrontery to declare:

"The best proof that I by no means dodge criticism is that I myself arranged for the Theory of Relativity to be discussed in Bad Nauheim."²²⁹

Writing of his own mental processes, Einstein said:

"I never came upon any of my discoveries through a process of rational thinking. Science and Art tend to coalesce in aesthetics, plasticity and form. The greatest scientists are always artists. People should be like animals, more intuitive and not too conscious of what they are doing when they are doing it. There comes a time when the mind takes a higher plane of knowledge, but can never prove how it got there."²³⁰

And of General Relativity he said:

"The only thing I firmly *believed* in Prague was that the Equivalence Principle had to be incorporated. The whole *faith* in the theory rests on the *conviction* of this principle. I had not *lost faith* in Special Relativity either, but *believed* that the theory was likewise incomplete."²³¹ (italics ours)

'Belief', 'faith' and 'conviction' being *religious*, and not rational/scientific terms.

Einstein recounted how after his conversation with Michele Besso he "suddenly saw" where the key to Special Relativity lay^d. And that after seeing a man fall from a roof-top,

^a Kurt Blumenfeld (1884–1963).

^b *German Natural Scientists*.

^c Or "*filer à l'anglaise*": ('to take English leave'), as they say in France.

^d p. 2.

the Equivalence Principle "suddenly struck him"^a. The word "suddenly" appears in both these quotes suggesting 'epiphanies', sudden intuitive insights.

Like the autistic mathematical genius^b, Einstein seems to have arrived at his conclusions via intuition rather than rational deduction. He got the right answers (well: not always!), but couldn't say how. This would explain his notorious ineptness at defending his own theories.

Chaim Weizmann was probably close to the mark when he called Einstein:

"A poet in science, able to intuitively detect fallacies in the theories of others, but needing someone else to work out the details for him."²³²

Einstein was, for instance, the first physicist to say that Planck's discovery of the quantum would require rewriting the whole of physics²³³.

The man

On his ETH course Einstein attended few lectures, preferring to pursue his own extra-curricular interests. His friend Marcel Grossmann however attended all of them, and took neat copious notes which he made available to Einstein²³⁴. With his eidetic memory, Einstein presumably photo-copied them into his brain the night before the exam, and thereby managed to scrape through²³⁵. (Well, this is evidently conjecture. But it is what one can imagine.)

After graduating in 1900 Einstein was unemployed for two years. Till finally in June 1902 – thanks principally to Marcel Grossmann's father who knew the director personally – he got a job on a trial basis as a patent clerk, 3rd class, in the Swiss Federal Patent Office in Berne²³⁶.

In 1905 came his first master stroke: the buttering up of Max Planck with "his" (probably Mileva's^c) photoelectric effect paper. This and Minkowski's 1907 use of his Special Relativity paper gave him a certain visibility within German physics. For the sake of appearances he now evidently had to be "scientifically authenticated", i.e. got into a proper academic job²³⁷.

In 1909 he was offered a teaching post at the ETH in Zurich. And in 1910 a full professorship at the German university of Prague. Both were thanks to Max Planck's glowing recommendations of him. He wrote:

"Einstein's work on Relativity probably exceeds in audacity everything that has been achieved so far in speculative science "²³⁸

even comparing him to Copernicus.

In 1912 Einstein returned to the ETH in Zurich. And then in 1914 moved to Berlin to become a professor at the Humboldt University, with a special clause exempting him from most teaching obligations. Both of these posts were again mainly due to Max Planck, by now Dean of Berlin University and the dominant figure in German physics.

In 1918 Einstein was admitted to the prestigious Prussian Academy of Science. Planck said in his proposal:

"There is hardly one of the great problems of modern physics to which Einstein has not made a remarkable contribution."²³⁹

In the same year Einstein reciprocated by proposing Planck for the Nobel prize²⁴⁰. He remained in Berlin till his emigration to the USA in 1933.

^a p.2.

^b p.2.

^c p.2.

In 1919 his second master stroke: his carefully cultivated friendship with Arthur Eddington, came to fruition with the solar eclipse expedition's alleged "confirmation" of General Relativity. From then on the story has been told.

Another thing Einstein was a past master at was *exploiting others* – in the nicest possible way of course. Marcel Grossmann for his lecture notes; Grossmann's father for his patent office job; Mileva (probably) for his theoretical work; Planck for his academic positions (without Planck Einstein could well have remained a patent clerk for the rest of his life); Minkowski and his space-time concept for promulgating Special Relativity; Grossmann and other mathematicians for General Relativity; Eddington, Weizmann and the Zionist press for turning him into a world celebrity. And who knows how many others along the way we have never heard of. Not to mention all those – Lorentz, Poincaré, dePreto, etc. – whose work Einstein plagiarized without acknowledgement.

Returning to the aether, having discarded it in his 1905 Special Relativity paper, Einstein embraced it in his 1920 Leiden speech. But then in 1925 said that if Dayton Miller's aether wind measurements were in fact valid, Relativity would "collapse like a house of cards".

So what, then, was Einstein's true position on the aether? Detail: his 1920 speech was to inaugurate his appointment as "Special Professor" at Leiden University at the invitation of Paul Ehrenfest and Hendrik Lorentz²⁴¹. And the latter was of course the "Mr Aether" of his time. What could a serial bum-licker like Einstein do under the circumstances but heartily endorse it? When in Holland do as the Dutch do.

Albert and Mileva separated in 1916. She returned to Zurich with the two boys. He stayed on in Berlin, moving in with his cousin Elsa Lowenthal (née Einstein) and her two daughters Ilse and Margot.

Einstein, however, moved not only into Elsa's house, but also into her bed. While simultaneously making sexual advances towards her teenage daughter Ilse²⁴². Initially he seems to have had little success, since Ilse wrote to a friend:

"I have not the least desire to be close to Einstein physically."²⁴³

But she appears later to have relented, since Einstein wrote in a 1918 letter to Max Born:

"We, I and the small harem, eat well and are thriving."²⁴⁴

Turned down in matrimony by Ilse, Einstein married Elsa in 1919, a few months after his divorce from Mileva became final²⁴⁵. Elsa was an excellent German-style *hausfrau* and took good care of him. He stayed with her for the rest of her life – she died in 1936.

Einstein's theory that everything is relative got applied to his marriage with Elsa also. Bjercknes tells of the Chaplinesque way in which he would blatantly flirt with other attractive women, with "my old lady" – as he called Elsa – at his elbow. He is reputed to have had a number of more or less open affairs with – as *Time* magazine put it when naming him its Person of the 20th Century:

"The ladies who swarmed around him like moonlets circling a planet."²⁴⁶

Elsa's comment on all of this was:

"I am the one he goes home with."²⁴⁷

(Well, maybe not always.)

Einstein was also somewhat of a misogynist. In 1906 he was arrested twice for domestic violence. In one of her police reports, Mileva states that when she came into his study to ask if he wanted some coffee, he flew into a rage and began choking and striking

her, threatening to stab her with his pen. The second report is similar²⁴⁸. We noted his childhood attacks of anger^a

While still living with Mileva in Berlin, Einstein stipulated in a July 1914 letter the conditions under which their marriage could continue:

- "– 1) you will see to it a) that my clothes and linen are kept in order; b) that I am served three regular meals a day in my room
- 2) you will renounce all personal relations with me except when required to keep up social appearances
- 3) you will expect no affection from me, and must leave my bedroom or study at once without protesting when I ask you to."²⁴⁹

He held that:

"A female's production centre is not situated in the brain. Women are there to cook and nothing else. A good wife stands somewhere between a pig and a chronic cleaner. Women are not suited for theoretical physics. I would never let a daughter of mine study the subject."²⁵⁰

In spite of all of which, and his bombastic self-promotion, he could nevertheless be disarmingly open and frank:

"In my view the cult of individuals is always unjustified. There are plenty of the well-endowed. It strikes me as unfair, even in bad taste, to attribute super-human powers of mind to only a few of them. This has been my fate. The contrast between the popular estimate of my achievements and the reality is simply grotesque."²⁵¹

He wrote to Lorentz in 1920:

"I am not able to deliver lectures and dispense original ideas virtually effortlessly as you can, with your refined and versatile mind. Awareness of my limitations pervades me, especially seeing how my faculties have been over-rated after a few consequences of the General Theory of Relativity stood the test."²⁵²

His objective view of himself, and his Buddhist-like non-attachment, may have derived from his deterministic philosophy:

"I do not believe in freedom of the will. Schopenhauer's words 'Man can do what he wants, but cannot will what he wills' accompany me in all situations. They reconcile me with the actions of others, even if they are painful. My awareness of my lack of freedom of will preserves me from taking myself and my fellow men too seriously, and from losing my temper."²⁵³

And:

"I am a determinist. Jews believe in free will, that a man shapes his own life. I reject that doctrine. In that respect am not a Jew. Everything is determined by forces over which we have no control. Human beings, vegetables and cosmic dust all dance to a mysterious tune intoned by an invisible piper."²⁵⁴

Joke or swindle?

Returning to Louis Essen asking whether Relativity was a joke or a swindle^b: the only person who can answer this is evidently Einstein himself. Let's ask him:

^a p.2.
^b p.2.

"Which was it, Albert? A swindle? You deliberately conned us, reckoning we were too dumb to realize? In line with your opinion of human intelligence in general^a. Or was it a joke? You knew we would get it one day – we're not *that* stupid. You just wanted to see how long it would take^b."

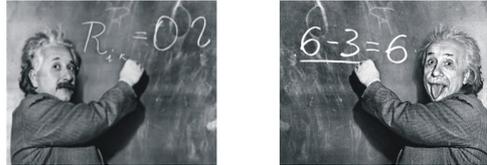


Fig. 32. Which was it, Albert?²⁵⁵.

Unless further evidence comes to light, we will obviously never know for sure. Voltaire however held that:

" God is a comedian, playing to an audience too afraid to laugh."²⁵⁶

Who knows? Einstein could have seen himself as a comedian-god, peddling a totally incoherent theory to a physics audience too afraid to laugh. In which case Relativity is simply another delicious Jewish joke, along with *Oedipus schmoedipus*^c and all the others. Oliver Heaviside as we saw also reckoned Einstein had to be joking

"I really think he is a practical joker, pulling the legs of his enthusiastic followers, each more *einsteinisch* than he. He knows the weakness of his theory and only propounds it to annoy."^d

The story of the 'Emperor's New Clothes' is almost – but fortunately not quite – too well-known to be retold:

Two tailors arrive at the Emperor's court, offering him a suit of clothes so magnificent as to make him the envy of all the other kings in the land. With the very special quality that they would only be seen by the intelligent, being invisible to anyone unfit for office or irremediably stupid.

The Emperor, who was obsessed with fine clothing, obviously accepted. Tables were set up, scissors and needles brought, and the tailors set to work laying out invisible cloth, cutting and sewing it with invisible thread, and calling the Emperor in from time to time for trial fittings.

News of the new clothes spread fast, and by the time they were finished the whole kingdom was assembled for their official presentation. Aided by the tailors the Emperor stripped naked, donned his new clothes, and to a fanfare of trumpets emerged from his palace at the head of a procession of nobles and courtiers. While his subjects all applauded wildly, commenting to each other on how magnificent the new clothes were ... That is, till the applause finally died down and a small child's voice was heard to say:

– "Mummy! Why isn't that funny man wearing any clothes?"

^a p.2.

^b Maybe not realizing it would be more than a century!

^c Ok! ok! Should you never have heard *Oedipus schmoedipus*, here it is: Jewish mum bumps into a friend on the street. "Darling!" gushes the friend, "It's been *ages*! And how is your boy?" "Not too good, I'm afraid", says the mother, "His analyst says he's got an Oedipus complex." "Ach!", says the friend, "Oedipus, schmoedipus! What does it matter? So as long as he loves his mother." (An Oedipus complex being a love fixation on one's mother.).

^d p.2.

Einstein has been strutting around in his birthday suit for more than a century now. While the mainstream scientific community, almost to a man, has applauded his Special Relativity clothes. And when some ingenuous young physicist dared to ask why he was naked, Mummy Establishment Physics clammed his mouth shut with her hard horny hand. Ingenuous young physicists should be seen, not heard.

An alternative interpretation of the Einstein myth is of course that, based on an exceptionally modest physics degree and a logically totally incoherent theory, Einstein got himself crowned one of the most brilliant scientists of all time and man of the 20th century. Now *that*, deep in our hearts, is something we would all like to be able to do. And we applaud when someone like Albert E does it.

FINALE

Newton²⁵⁷

A key supporting role in the Einstein saga is played by *Isaac Newton*, the other most famous scientist of all time. It is interesting to compare the two.

Newton was likewise a lonely child with a difficult upbringing. Born prematurely on Christmas day of 1642 in a manor house in the village of Woolthorpe, in the English county of Lincoln, he was so small that his mother said he would have fitted into a quart mug. His father, a prosperous farmer also named Isaac Newton, had died three months previously.

When Newton was three his mother got married again to an elderly clergyman. Isaac disliked him, and so was sent off to live with his maternal grandmother. But since he also had little affection for her, this was another traumatic experience for him. He always resented his mother's having remarried. When at the age of 19 he made a list of all the sins he had ever committed (he was somewhat compulsive!), they included:

"Threatening to burn my father and mother and the house over them^a".

When Newton was ten his stepfather died and he returned to live with his mother. His relief was short lived. Less than two years later he was sent away again, this time to study at the King's School in Grantham.

In 1661 he was admitted to Trinity College, Cambridge. Like Einstein he was an undistinguished student, preferring to follow his own interests. He obtained his degree in 1665. Shortly after this the university closed for two years due to the Great Plague, and Newton returned to his home in Woolsthorpe. It was during this period that he initiated his main scientific work on differential calculus, optics and gravitation.

When the plague ended in 1667 Newton returned to Cambridge to become a fellow of Trinity College. In those days this required one to be an ordained Anglican priest, but which Newton desired to avoid. He was highly religious, owning more than 30 bibles. And in fact wrote more on subjects like the Early Church Fathers, biblical hermeneutics, alchemy, and the occult in general, than on the Natural Science for which he is best known.

His concept of gravity as an invisible force acting over empty space, for instance, was criticised for "introducing occult agencies into Science". In 1704 he wrote a tract predicting from biblical sources that the world would end no earlier than 2060, saying:

"I mention this not to assert when the end shall be. But rather to stop the rash conjectures of fanciful men who frequently predict it. This brings the sacred prophecies into discredit, since their predictions often^a fail."²⁵⁸

^a Like Einstein, Newton could also have been somewhat autistic.

Newton's religious views were known to be highly unorthodox. But living in an age of religious intolerance, he wisely kept quiet about them. He is said to have held that the doctrine of the Holy Trinity contravened the first commandment²⁵⁹. What he actually believed is however still a matter for discussion. John Maynard Keynes^b called him:

"Not the first of the age of reason, but the last of the magicians."²⁶⁰

Luckily for Newton, the ordination requirement for Cambridge fellows had no deadline and could be postponed indefinitely. But this was no longer the case when he was made a professor. He wormed his way out of that one by getting a special exemption from the king, Charles II. (No flies on old Isaac!)

He got engaged once, in his late teens, but never married. He was always too involved in his work and studies. He was twice made a Member of Parliament for short periods. His only recorded "speech" was to complain about a cold draught and request that the window be closed.

In his mid-fifties he was appointed Master of the Royal Mint (equivalent to today's Governor of the Bank of England), and his life underwent a radical change. His income shot up from £60 to £500 a year; he exchanged his modest lodgings in Cambridge for a palace in London; entered society; kept horses, carriages and servants; was knighted; and became an influential personage at court. He is said to have commissioned at least 14 portraits of himself.

Twenty percent of the coinage at the time was estimated to be false. But although counterfeiting was technically a capital offense, in practice few were ever convicted. Newton set about changing that. He had himself made a Justice of the Peace. And then frequented bars and taverns in disguise, gathering evidence personally. He successfully prosecuted 28 offenders.

Among them was a certain William Chaloner, whose feats included getting Parliament to adopt a method of producing coinage that, according to him, couldn't be counterfeited. And then using it to produce false coinage himself. He became rich enough to posture as a gentleman.

Chaloner was accused and convicted. But with friends in high places he was subsequently acquitted and released. Newton however persisted. He had Chaloner brought to retrial where he was again convicted. And this time hung, drawn and quartered at the Tyburn gallows in March 1699.

Newton became president of the Royal Society, enjoyeing to the full its special privileges of robes of state, a mace, and a seal bearing the motto "Let no one's word be law." The last was however not strictly observed. Newton was re-elected president with absolute regularity; his word was law; and the Royal Society became popularly known as "Sir Isaac's Parliament".

By now monarch of all he surveyed, Newton occupied in Western Science the place of Pythagoras in antiquity, whose disciples were wont to crush all opponents with the words "Pythagoras himself said so".

His perpetual neurosis reached a climax in his passionate crusade to destroy his arch-enemy Gottfried Leibniz^c. The principal dispute was over who first discovered differential calculus. Most historians today believe it was Newton. But he published nothing before 1693, apparently fearing criticism, and only gave a full account in 1704. Whereas Leibniz, who had developed the theory independently using a different notation^d, began publishing in 1684, nine years before Newton.

^a He presumably meant "To date, always".

^b John Maynard Keynes (1883–1946), Cambridge economist.

^c Gottfried Leibniz (1646–1716), German philosopher and polymath.

^d The one used today.

In spite of Newton's claim being unprovable, depending solely on his word, it was *Leibniz* who was required to prove that he had not plagiarized. The absurdity of the charge demonstrates the status Newton enjoyed.

In 1711 the Royal Society published a study, the *Commercium epistolicum*, proclaiming Newton to be the true discoverer of calculus and condemning Leibniz for plagiarism, labelling him a fraud. The validity of the "study" was however later cast into doubt when it transpired that Newton himself had composed it, and had personally thrust it upon the Society's committee of allegedly impartial judges. The bitter controversy only ended with Leibniz' death in 1716

Under Newton's sway the cosmos, previously subject to Divine Intervention, was redesigned along universal rational lines by a Master Creator whose existence could not be denied in the face of the grandeur of His Creation.

In such an absolutist universe, space and time evidently had to exist absolutely, independently of matter. But when challenged by Leibniz to prove this, all Newton could find to say was that they were "absolute in the mind of God". Leibniz rightly retorted that this was scientifically meaningless. And when asked to define his terms, Newton replied.

"I do not define space, time and motion, as being well known to all."²⁶¹

(A mega conceptual copout, if ever there was one!)

Newton died in 1727, refusing on his death bed the holy sacrament offered to him. He was buried among kings and queens in Westminster Abbey. His epitaph written by Alexander Pope^a ran:

"Nature and Nature's laws lay hid in night.
God said 'Let Newton be' and all was light."

In a 1999 opinion poll, one hundred leading physicists voted Einstein "the greatest physicist ever", with Newton as the runner-up. A parallel survey of rank-and-file physicists, however, gave the top notch to Newton²⁶².



Fig. 0-33. Sir Isaac today.

Cahill

Another key figure in the modern Relativity saga is *Reginal Cahill*. His remarkable insight into the working of the interferometer^b reconciled a whole range of previously apparently divergent aether-wind measurements, using widely differing experimental techniques, thereby conclusively resolving a dissension that had split the world of physics apart for more than a century.

Cahill's could well come to be seen as one of the greatest scientific syntheses of all time. If Michelson got a Nobel prize for putting a *wrong* interpretation on his results, Cahill certainly deserves one for providing the right one.

^a Alexander Pope (1688–1744), English poet.

^b p.2.

Interested in this Cahill guy, I looked him up on the Internet²⁶³. "Cahill" being a fairly common Irish family name, there are plenty of them. There is Barry Cahill, a Gaelic footballer who plays for his club and also his province. And Martin Cahill, deceased, a prominent Dublin criminal known for hiding his face from the media. Also Leo Cahill, an American from Illinois who coaches a Canadian football team, and has five children called Steve, Christy, Terry, Lisa and Bettye. And Sarah Cahill, a beauty queen from Minnesota, who competed for Miss USA but didn't reach the semi-finals

But when one gets to "Reginald Cahill", although his name is on the list as "an Australian theoretical physicist", all one gets clicking on it is "Page does not exist"²⁶⁴.

(Reader, permit that I draw you metaphorically aside for a wee moment and offer you a wee word of advice. Should you be ambitious, and desirous of making your name in this world, becoming a ground-breaking theoretical physicist – even one deserving a Nobel prize – is maybe not your best option. You could try something to do with football.)

Faith

Religions make an *us-them discrimination*. "We" are the believers, the good, the pure, the clean, the included, the biblical sheep. "They" are the infidels, the bad, the impure, the unclean, the rejected, the biblical goats. What distinguishes the believing sheep from the infidel goats is their *faith*.

Faith in something that *could conceivably* exist: for instance E.T.s or unicorns, is however too easy. Anyone can do it. It doesn't serve the discriminatory purpose. But belief in a *logical contradiction*, something that *couldn't possibly* be true – now that's *real faith* that serves to distinguish.

The function of Special Relativity in modern physics is not, therefore, to explain physical reality, which it blatantly doesn't do. But rather to filter the physicist sheep from the physicist goats. Which young physicists will unquestioningly accept the pronouncements of their "superiors"^a, no matter how fatuous? Evidently: those who are prepared to unquestioningly accept (strictly: *say they accept*) a completely fatuous theory of Relativity, the physicist sheep.

Their rewards being the jobs, promotion, research funding, pension schemes, etc. that the Physics Establishment so generously bestows upon them. And denies to the heretical free-thinking physicist goats, those who refuse to accept the Relativity nonsense.

It is ironic that a professed belief in Einsteinian Relativity should have become a criterion for identifying conformist sheep, when its progenitor with his:

"Unthinking respect for authority is the greatest enemy of truth."^b

was a dyed-in-the-blood goat. As he himself said:

"To punish me for my contempt of authority, Fate made me one."^c

Einsteinism is effectively a *scientific fundamentalism*. Its basic *credo* being – paraphrasing a sign about the boss that people sometimes stick up on their office walls:

Art. 1) Einstein is right

Art. 2) Einstein is always right

Art. 3) Should, exceptionally, Einstein be wrong,

Arts 1) and 2) take immediate effect

^a Those higher up in the Physics hierarchy.

^b p.2

^c p.2.

Thought-stop (1)

Herbert Dingle recounts that while wrestling with the nitty-gritty of the twin absurdity, he sent a draft of his paper to a colleague, Kathleen Lonsdale, asking her to look over it for him. Six months went by before she replied:

"I spent all this time trying to make sense of your paper. But my mind always went blank. Were I to spend weeks reading it again, it would still mean nothing to me."²⁶⁵

She rationalized her reaction as due to the way Relativity had been presented to her as a student:

"Cloaked in metaphysics. I ascribed my incomprehension to my own incompetence, rather than to that of my tutors."²⁶⁶

Remembering that her unfortunate tutors were obliged to try to explain rationally something that – being rationally incoherent – *cannot possibly* be explained rationally. Louis Essen also noted that:

"A common reaction of physicists to Relatively Theory is that, although they do not understand it themselves, they think it is so widely accepted that it must be correct. I must confess that until recent years this was my own attitude."^a

This is the Goebbels principle^b. If everyone believes that everyone believes that something is correct, even though they don't understand it themselves, it ends up being said to be:

"Of course it's correct", people will say, "Ask anyone."

George Orwell^c had the concept of *thoughtstop*. He described it as:

"The tendency to stop short, as though by instinct, at the threshold of any dangerous thought. This includes not perceiving the logical errors of the simplest arguments if they are inimical to the Established Word. And feeling bored or repelled by any train of thought that leads in a heretical direction. Thoughtstop is protective stupidity."²⁶⁷

Einstein also held that:

"Few people are capable of expressing opinions differing from those of their social environment. Most are *incapable of even forming* such opinions."^d
(italics ours)

A train of thought that is unconsciously sensed as being likely to lead to questioning one's individual beliefs, or the collective wisdom, is unconsciously cut off before it ever reaches consciousness. In Lonsdale's words:

"One's mind simply goes blank".

Thought-stop (2)

Related to this is the process by which I personally ended up as an anti-relativist. Back in 2005, probably stimulated by the Special Relativity centenary, I thought:

"Omaigodd!^a I'm getting on. Its high time I understood the twin paradox. I'll go onto the Internet and find the answer."

^a p.2.

^b p.2

^c George Orwell (1903–1950), English writer.

^d p.2.

So onto the Web I went. And found explanations involving the Lorentz transformations, so had to get into those. And others using Minkowski space-time, so I had to understand that. And others requiring ... and so on almost *ad inf.* A 'symmetrical twin' case^b even came into my mind at that point, and I submitted a query on it to a physics forum, but got no reply.

And then ... it wasn't that I consciously thought "I'm obviously not intelligent enough". It was as if a soft woolly cloud subtly enveloped my mind. And without consciously realizing it, I forgot the whole question. Orwellian thought-stop blocking my potential "I am stupid" thought.

Five years later as I was finishing a projected philosophical tome^c, I thought:

"Omaigodd! I've put in all this stuff on quantum physics. I *can't* leave out Relativity. It would be too glaring a gap. I can't be *all that* stupid. If others can understand it, I can too."

So back onto the Web I went. And the Lorentz transformation ... and Minkowski space-time ... and ... Till one day as I was bogged down for the nth time in the nitty-gritty of the Hafele-Keating experiment, and got to the bit about the Earth's centre being taken as an 'at rest' reference, I suddenly thought – and this was certainly the happiest thought of my own relativistic life:

"Wait a minute! This isn't Relativity! No way! Special Relativity *specifically states* that there is no 'at rest' ... This is a *fudge!* ... Maybe it's *all a fudge!* ... Maybe the reason I can't understand Relativity is not that *I'm* stupid. But that *it's* stupid – i.e. logically incoherent and inherently ununderstandable."

But then I immediately thought (this was before I knew of anti-Relativity):

"Me right and Einstein wrong. No, that's impossible. I'm going out of my mind. That's what's happening."

Orwellian thought-stop blocking my potential "Einstein was wrong" thought.

But then as my mind slowly relaxed, and I started searching the Web for previously inconceivable topics such as as "Einstein wrong", I found that loads of others had reached the same conclusion. I joined them.

Market

The ultimate fate of almost everybody and everything of any renown in the modern world is to become *advertising copy*. In spite of Einstein's holding the real evil to be the economic anarchy of capitalism^d, once he was dead and unable to prevent it this was his fate too. Maurice Allais:

"One way to get more money is to create a superhero like Einstein, whose standing is the product of the media and the physics community. Each group benefits enormously. Media corporations like *Time* magazine sell millions of magazines. The physics community receives billions in research grants."²⁶⁸

"Albert Einstein"®™ is now a registered trademark owned by the Hebrew University of Jerusalem, administered by the American advertising agency that controls the commercial usage of his and other names²⁶⁹. The agency points out in its website:

"Celebrated personalities deliver instant recognition, recall and credibility to your advertising campaign and/or promotional program."²⁷⁰

^a A popular interjection, thought to be of Celtic origin.

^b Fig. 10.

^c I still am.

^d p.2.

Today there are hundreds of products trading on Einstein's lucrative image as the symbol of things brainy – and marketers like their products to be perceived as brainy. There are *Einstein Coffee Mugs*. And *Einstein Holy Prayer Cards* depicting him before a chalkboard with a purple robe and halo. Also *The Ultimate Albert Einstein Carrot Cake* ("His genius lives on in this carrot cake", its manufacturer asserts). And even *The Albert Einstein Theory of Relativity Junior Baby Doll*, togged out in suitably relativistic lingerie.

"Einstein has gone beyond the figure that he is into iconic status", said one marketer, "He stands for almost any great idea now"²⁷¹

The Physics Establishment was likewise not amiss in recognizing the potential of the Einstein image. When deciding to celebrate the 1905 Special Relativity centennial, one of its stated objectives was to attract more students into physics:

"The general public's awareness of physics and its importance in our daily life is decreasing," said the *European Physical Society*, the international coordinator of the Einstein Year. "The number of students choosing physics has declined dramatically in recent years."²⁷²

The real reason could however not be a decreasing awareness of physics. But rather an increasing awareness of the hypocrisy, fraud, censorship and blatant pecuniary self-interest currently practiced by Mainstream Physics. (Well, this is evidently the author's purely personal opinion, with which the reader may or may not agree. But even if he doesn't, it is hoped that he at least appreciates the data and reasoning it is based on.)

The brain

In spite of Einstein having categorically refused permission for his brain to be studied after his death, Thomas Harvey, the Princeton Hospital pathologist who performed the autopsy, removed it before the cremation and took it home with him. Allegedly hoping that Science would one day discover what had made Einstein so intelligent.

Harvey later contacted scientists at McMaster University in Ontario, Canada. They found that the part of the brain thought to be related to mathematical reasoning^a was 15% wider on both sides than is normal^b. And that a groove normally running from the front of the brain to the back did not extend all the way in Einstein's case.

"That kind of shape is not observed in any of our brains. It is not depicted in any atlas of the human brain."²⁷³

said Sandra Witelson, the neuroscientist who led the study, published in the British medical journal *The Lancet*.

Parts of the brain still remain in a glass jar at Princeton University. According to a source:

"Harvey became obsessed with the brain and kept some of it for decades, only returning it when he was nearly 90 years old. He believed that it would reveal the secret of genius and make him famous. Neither occurred. But the brain became so imbued with Einstein's charisma that all who saw it were galvanized by dreams of riches and glory. Scientists, journalists, entrepreneurs and the executors of Einstein's will all tried to get in on the action. The organ became a kind of saintly relic. Rather than hair, blood or a toenail, there was pickled cerebral matter."²⁷⁴

Sic transit gloria mundi^c.

^a The inferior parietal region.

^b Remembering that Einstein was in fact a lousy mathematician (p.2).

^c There goes worldly glory."

Petr Beckmann^a noted:

"Einstein is dead. But it will take decades to bury him."²⁷⁵

(You can say *that* again, Petr!).

APPENDIX

Clock-slowing

Imagine photon clocks with mirrors a vertical distance of 1 m apart. In $1/c$ seconds, the station clock photon travels a distance of 1 m and the clock ticks once, Fig. 34a.

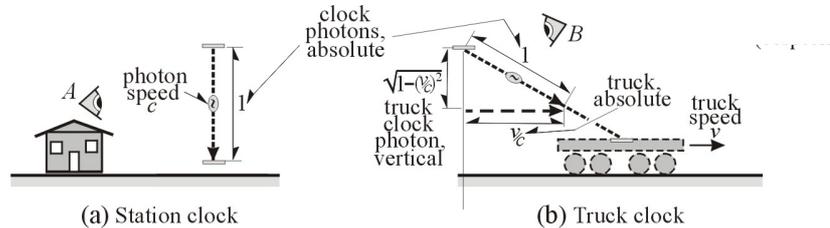


Fig. 34. Clock-slowing (3).

During this time the truck B photon travels a distance of 1 m towards its lower mirror, Fig. 34b, and the truck itself moves forward a distance v/c . The vertical distance travelled by the truck B photon being $\sqrt{1 - (v/c)^2}$ ^b, the truck clock B runs slow by the ratio of this to the overall vertical distance of 1 m, giving the Lorentz factor γ ^c.

On the Lorentz Aether Theory, the corresponding diagram for the truck clock B is that of Fig. 0-35. In $1/c$ seconds the truck clock B photon travels a distance of 1 m through the aether. And during this time gets 'blown back' a distance v/c by the aether headwind, Fig. 20b^d. The result is again the factor γ .

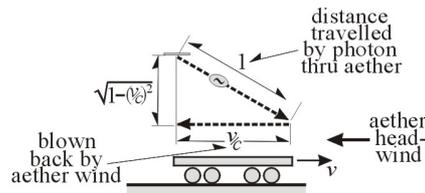


Fig. 0-35. Lorentz Aether Theory (2).

Einstein Postulates (2)

In spite of Einstein claiming the logical consistency of his theory^e, his two postulates contain a number of anomalies.

Starting with the second, a constant^f speed of light *includes* it being independent of the speed of the emitting body^a, making the corresponding rider redundant^b. And more

^a Petr Beckmann (1924-1993), Czechoslovakian professor of electrical engineering at Colorado University.

^b Pythagoras.

^c eq.1, p.2.

^d When swimming across a fast-flowing river one has to head somewhat upstream, and takes longer to cross.

^e p.2.

^f In his words "definite".

seriously, Einstein doesn't state *with respect to what* the speed of light is constant, on his own criterion^c making his statement is meaningless.

In the first postulate he however talks of "reference frames for which the equations of mechanics hold good", i.e. inertial frames. And so presumably means one of these. But if this is what he *did* mean, then why didn't he say so clearly, rather than leaving it to conjecture?

And since the speed of light is one of the laws of physics, the first postulate in fact already *requires* that it be the same for all inertial observers. Making the second postulate as a whole redundant.

There is effectively only one Einstein postulate:

the laws of physics are the same for all inertial observers

All in all the postulates are a muddle. And if something starts off in a muddle, it is hardly surprising to find that it ends up as one.

Gravitational photon deflection

In his 1916 paper^d Einstein states that:

"According to General Relativity, a ray of light will experience a curvature of its path when passing through a gravitational field. Half of this deflection is produced by the Newtonian field of attraction of the Sun. And the other half by the geometrical modification ('curvature') of space caused by the Sun."²⁷⁶

According to General Relativity, however, there is no such thing as Newtonian gravity, the *whole deflection* being caused by the curvature of space. Einstein seems to have got himself a bit screwed up here too.

Lorentz transformations

The Lorentz transformations relate the coordinates of an event in different inertial frames. Consider an event occurring at point (x_a, t_a) in frame A, Fig. 0-36a. The question is: what are its corresponding coordinates in frame B, moving at steady speed v relative to frame A?

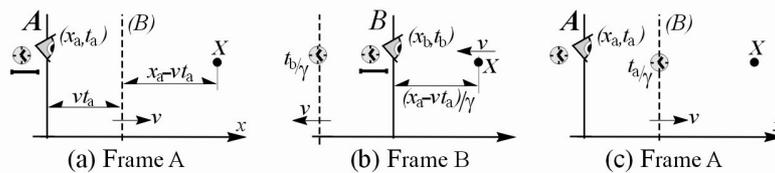


Fig. 0-36. Lorentz transformations.

Everything stationary in frame A. In frame B moves to the left at steady speed v , Fig. 0-36b. The frame A distance $x_a - vt_a$ ^e is then contracted by γ . And clock A runs slower than clock B by γ , giving:

$$x_b = (x_a - vt_a)/\gamma; \quad t_a = t_b/\gamma \tag{eq.6}$$

These, however, are *not* the standard Lorentz transformations:

$$x_b = \gamma(x_a - vt_a); \quad t_b = \gamma(t_a - vx_a/c^2) \tag{eq.7}$$

^a And/or observer.

^b As already noted (p.2, note).

^c p. 2.

^d Under the heading "Deflection of Light by a Gravitational Field".

^e Of the event from the B axis.

So the Lorentz transformations cannot be derived from geometrical reasoning and the SR time-dilation and length-contraction relations alone. How then did Lorentz arrive at them? Well, it appears that he simply presented them^a without any derivation or justification. Poincaré used the same relations. But likewise gave no indication of how they were derived²⁷⁷.

All of which is *distinctly fishy*. The problem becomes apparent when one considers the clock B time in frame A, Fig. 0-36c, which due to time dilation is:

$$t_b = t_a/\gamma \quad (\text{eq.8})$$

i.e. the *inverse* of eq.6b. This is the clock absurdity again: each observer sees the other's clock running slower than his own.

Relativity overall being rationally incoherent, one can't expect rational explanations. And shouldn't be surprised when one doesn't get them.

Naturwissenschaften

The verbatim text:

"With respect to the coordinate system B^b, the phenomenon is explained in the following manner: During procedural steps 2 and 4, clock A^c, moving at velocity v, has indeed a slower rate than clock B^d which is at rest. But the time lag gets overcompensated by the faster rate of A during procedural step 3. Because, according to the general theory of relativity, a clock has a more accelerated rate the higher the gravitational potential is at the clock's location; and during procedural step 3, B is indeed at a location of higher gravitational potential than A. Calculation shows that this running-ahead amounts to precisely twice as much as the lag-behind during the procedural steps 2 and 4. This analysis clarifies completely the paradox you referred to."²⁷⁸ (*sic*)

Reductio ad absurdum

The philosophical *reductio ad absurdum* principle says that premisses leading to a contradictory/absurd conclusion are themselves contradictory/absurd:

*premisses leading to a contradictory/absurd conclusion are
themselves contradictory/absurd*

If a contradictory/absurd premisses is *defined* as one leading to a contradictory conclusion, this is a truism.

Consider the premisses:

- Fido is a dog
- dogs are animals
- Fido is an animal

These relations are rationally coherent in the sense that they tie in together with no contradictions, Fig. 37a.

^a In his 1895 "Versuch" paper.

^b His K'.

^c His U¹.

^d His U².

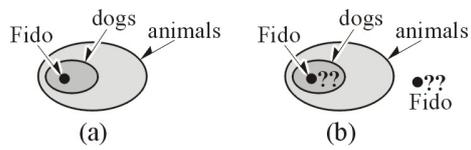


Fig. 37. *Reductio as absurdum*.

Now consider the "premisses":

- Fido is a dog
- dogs are animals
- Fido is not an animal

The first two relations lead to the 'Fido is an animal' as before. But being contradicted by the third, the overall premiss set is *incoherent*, or *nonsensical*, or *absurd*^a, Fig. 37b.

Noting that any two premisses taken alone *are* rationally compatible. No single one of them can be said to be "wrong". But the three together are logically incoherent.

^a We take the terms as equivalent.

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