

length (e.g., length contraction), and produces accompanying paradoxes (e.g., the Twin Paradox) as a side effect.

4. Conclusion

Moving Systems Equations, as developed and used by Michelson and Morley, Maxwell, Lorentz, and Einstein, are all based on length based equations. Due to the mistreatment of wavelength and frequency as length and time, respectively, the resulting equations and models are inherently length based.

Experimental phenomena can be observed as falling into two categories: length based and wavelength based. When wavelength based experiments, such as Michelson-Morley or Ives-Stillwell are evaluated using wavelength based models, they yield quantitatively better results than when evaluated using equations associated with length based models. Additionally, wavelength based models are easier to understand because they do not require non intuitive concepts such as time dilation or length contraction, nor do they produce side effects like the Twin Paradox.

The Twin Paradox, or paradoxes with similar characteristics, will be inherent in any length based model that tries to explain wavelength observations. Such interpretations will also require explanations for the theoretical *change in length* and the *change in time*; which Einstein does using length contraction and time dilation. However, when wavelength based observations are explained using a wavelength based model, such explanations are not necessary. As a result, a wavelength based model does not enable the introduction of a paradox like the Twin Paradox. Wavelength based models provide a foundation for alternative theories (e.g., Modern Classical Mechanics) that distinguishes between wavelength and length, where the appropriate use of equations yield the best mathematical results.

References

- [1] H. Dingle, *Science at the Crossroads*, (London: Martin Brian & O'Keeffe, 1972)
- [2] N. Percival, "An Open Letter to the Physics Community: The Twin Paradox" (2010), www.twinparadox.net.
- [3] A. Einstein, *The Meaning of Relativity*, (London: ElecBook, 1922).
- [4] S. Bryant, "Episode 22 Podcast / Conference Presentation - The Failure of Einstein's Spherical Wave Proof" (NPA Conference, Cal State - Long Beach, 2010), www.RelativityChallenge.com.
- [5] Wikipedia, "Twin Paradox" (May 2011) http://en.wikipedia.org/wiki/Twin_paradox.
- [6] A. Einstein, *Annalen der Physik* 17: 891 (1905). (Original German version: http://www.wiley-vch.de/berlin/journals/adp/890_921.pdf, English translation: <http://www.fourmilab.ch/etexts/einstein/specrel/www/>, both in public domain).
- [7] S. Bryant, "Revisiting the Ives-Stillwell Experiment", *Galilean Electrodynamics* 19: 75 (2008).
- [8] S. Bryant, "Revisiting the Michelson-Morley Experiment Reveals Earth Orbital Velocity of 30 km/s", *Galilean Electrodynamics* 19: 51 (2008).
- [9] S. Bryant, Draft of *Physics 3.0: Modern Classical Mechanics*, To be published.
- [10] J. Maxwell, *A Treatise on Electricity and Magnetism*, Vol 1, 3rd Ed., (Clarendon Press, 1904)
- [11] J. Maxwell, *A Treatise on Electricity and Magnetism*, Vol 2, 3rd Ed., (Clarendon Press, 1904)
- [12] F. Everest & K. Pohlmann, *Master Handbook of Acoustics* (New York: McGraw Hill, 2009)
- [13] Wikipedia, "Sampling Rate" (Apr 2011) http://en.wikipedia.org/wiki/Sampling_rate.

Failure of the Relativistic Hypercone

Steven Bryant

1563 Solano Avenue, #205, Berkeley, California 94707

e-mail: Steven.Bryant@RelativityChallenge.com

website: www.RelativityChallenge.com

Glenn Borchardt

Progressive Science Institute, PO Box 5335, Berkeley, CA 94705

e-mail: gborchardt@gmail.com

website: www.scientificphilosophy.com

Einstein built relativity theory using two foundational shapes; the spherical wave and the hypercone. In 1922, he created the hypercone by defining l , or light-time, as $l = ct$. Conceptually and mathematically, Einstein used light-time l as a replacement for Time t in his derivation. Here we find that light-time l is actually a measure of Distance, not Time, because the result of a Velocity multiplied by a Time is always a Distance. Because Time and Distance cannot be used interchangeably, Einstein's mistreatment of light-time as both a Time and a Distance invalidates his hypercone concept and the resulting mathematical and theoretical conclusions. While a critical mistake, it also represents a cornerstone characteristic that permeates Relativity theory: The objectification of Time - or the treatment of Time as if it were a Distance. This objectification of Time, which is actually a measure of motion, has led to incorrect theoretical conclusions for over a century.

1. Introduction

Einstein's 1905 derivation fails because his Spherical Wave Proof is incorrectly interpreted as passing when, in fact, the transformed points do not form a spherical wave [1, 2, 3]. Because the transformed points do not form a valid sphere, his assertion that one is formed is false, invalidating his 1905 deriva-

tion [1,2]. This finding is difficult to detect because Einstein uses the equation

$$x'^2 + y'^2 + z'^2 = c^2 t'^2 \quad (1)$$

to determine if the transformed points form a sphere [1, 2, 3]. One can easily show that each of the transformed points will

always satisfy this equation, enabling one to reach a conclusion that a spherical wave is formed [1, 2]. However, adherence to this equation, alone, is not sufficient to establish the existence of a spherical wave [1, 2]. A second requirement is that the radius, or the distance from the center of the spherical wave to each of the transformed points, as defined by $c^2t'^2$, does not change [1]. This means that the use of Eq. (1) alone, without also confirming that the radius is the same for all points, leads to a false positive conclusion that the proof has passed, when it has failed [2]. Einstein did not test for this second requirement—that all points comprising the sphere have the same radius [1, 2].

Relativity theory proponents agree that the radius of each point of a spherical wave must measure the same distance from the origin. Rather than challenge the need for each radii to have the same measure, they instead defend Einstein's 1905 derivation by dismissing his statement that the transformed points form a spherical wave and suggest that the points form a hypercone, which is a conceptual shape Einstein uses in his 1922 derivation [4, 5, 6]. This paper examines Einstein's 1922 derivation where he establishes the hypercone as a key element of Relativity theory. We will show that Einstein makes significant conceptual and mathematical errors in his hypercone derivation that invalidates the derivation, the concept of the hypercone, and the resulting theoretical conclusions.

2. Discussion

In order to understand the nature of Einstein's mistake, we have to revisit the nature of mathematical *Types*, or *Units*. Many disciplines such as mathematics, computer science, chemistry, physics, and engineering, emphasize the importance of maintaining units as part of any derivation. In computer science, unit management is addressed using the term "Types." [7, 8, 9, 10] A Type is a category of data that helps ensure that variables do not get confused as part of a computation. Type mistakes have resulted in sensationalized media attention, such as when the Mars Climate Orbiter failed to achieve orbit and crashed into the Martian surface [11]. The cause was later found as a Type mismatch between Imperial units and Metric units [11].

There are two Type categories: Strongly Typed and Weakly Typed. Weakly Typed derivations use known implicit, stated explicit, or no Type conversions as part of the mathematical operations. As a result, such conversions are not guaranteed to behave as expected. Known implicit Weakly Typed conversions occur when the Types under consideration are similar. For example, as part of a derivation one can convert one meter into 100 centimeters without the need for an explicit math conversion. However, when an implicit Type conversion is not known and an explicit Type conversion is not given, Weakly Typed solutions will perform the mathematical operation with no type conversion and will produce erroneous results. For example, a Weakly Typed operation might incorrectly produce 27 as the answer to 3 feet multiplied by 9 yards (if an explicit conversion that associates yards and feet was not previously stated and an implicit conversion is not known). In a Weakly Typed system, this answer might be stated as 27 feet, 27 yards, or simply 27; all of which are incorrect.

Strongly Typed derivations, on the other hand, only use known implicit and stated explicit Type conversions. When a Type conversion is not possible (because it is not known or it is not previously stated), an error is produced and incorrect answers are not returned. For example, the result of 3 feet multiplied by 9 yards will be 9 square yards (when 3 feet is first converted to 1 yard), or it will be 81 square feet (when 9 yards is first converted to feet). A good Strongly Typed derivation will never yield 27 as the answer.

While identifying Type mistakes in engineering or computer science solutions is simplified by real-world problems that might be manifest, detecting Type mistakes in theoretical works is more challenging because they deal with concepts. A hypercone is an example of one such concept. Figure 1 is Einstein's illustration of a hypercone, which he uses to explain the geometry of Relativity theory [6]. While a hypercone may be one of the less familiar concepts from Relativity theory to the casual reader, one key characteristic is readily identified on his diagram; his use of l to represent the y -axis.

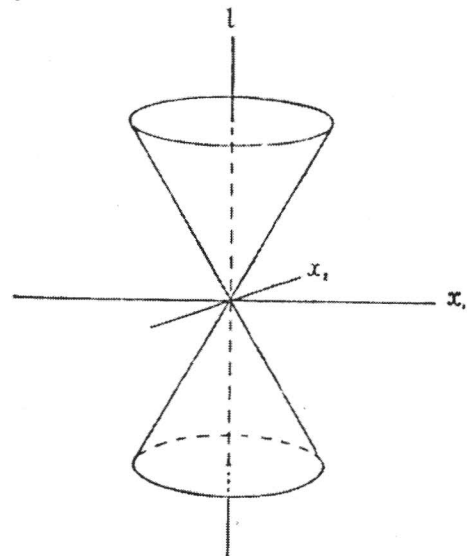


Fig. 1. Einstein's rendition of a hypercone as given in his manuscript *The Meaning of Relativity*. [6]

Einstein clearly defines the meaning of l , which establishes the meaning of the y -axis, when he says

"Before we analyze further the conditions which define the Lorentz transformation, we shall introduce the light-time, $l = ct$, in place of the time, t , in order that the constant c shall not enter explicitly into the formulas to be developed later." [6]

Thus, l , or the y -axis, represents Time. This conclusion that Einstein treats l as a type of Time is supported by statements like "At the definite K time, $l = 0...$ " that occur later in his derivation [6].

While not obvious, Einstein has incorrectly associated l as a measure of Time when it is actually a measurement of Distance because it is the result of a Velocity, c , multiplied by Time t . To confirm this finding, we consider the accepted equation that defines the relationship between Distance, Velocity and Time,

$$\text{Distance} = \text{Velocity} \cdot \text{Time} \quad (2)$$

We must show that the result of the multiplication of Velocity by Time always results in Distance that is measured in units of distance (e.g., meters). The proof:

- Define 1. Distance = Velocity · Time ,
 and 2. Velocity = $\frac{\text{units of distance}}{\text{units of time}}$.
 Since 3. Time = units of time
 then 4. Distance = $\frac{\text{units of distance}}{\text{units of time}} * \text{units of time}$,
 or simply 5. Distance = units of distance .

Thus we have established that Velocity multiplied by Time will always produce a Distance. Revisiting Einstein's first use of l : since c is a measure of Velocity and t is a measure of Time, l is a measure of Distance. Einstein's mistreatment of l as a measure of Time leads to incorrect conclusions about the behavior of Time. For example, he says

"A clock at rest at the origin $x_1 = 0$ of K , whose beats are characterized by $l = n$, will, when observed from K' , have beats characterized by

$$l' = \frac{n}{\sqrt{1-v^2}}$$

this follows from the second of [the equations] and shows that the clock goes slower than if it were at rest relatively to K' ." (emphasis added) [6]

His statement only makes sense if light-time, l , were actually a measure of Time. But since it is a measure of Distance, this statement is incorrect and his conclusion is not supported. Notice that while a clock, which is used to measure Time, can run slower or faster, a ruler, which is used to measure Distance, does not share a similar concept. A ruler cannot run slower or faster. The variable l is a unit of Distance and would be measured by a ruler, while t is a unit of Time and would be measured by a clock. The two cannot be used interchangeably. It is this mistreatment of l as a measure of Time that enabled Einstein to incorrectly conclude a hypercone and develop his accompanying theoretical interpretations.

This conceptual and mathematical mistake is extremely subtle and hard to detect for two reasons. First, when c is mistreated as the scalar (or unTyped) value 299,792,458, l is misinterpreted as Time because t and l have the same units. Furthermore, when c is assumed to be the scalar value 299,792,458, it does not represent the Velocity of the speed of light since we would not know if Einstein meant to say 299,792,458 pounds, 299,792,458 miles, 299,792,458 kilometers, 299,792,458 meters, 299,792,458 seconds, 299,792,458 miles per day, or any other measure of 299,792,458. Since c is a specific Velocity, its units are known and its value is properly stated as "299,792,458 meters per second." Thus, Einstein's substitution is invalid because when c is mistreated as a scalar it cannot be used to represent the speed of light. Second, Einstein's definition, *light-time*, contains the word "time" leading one to believe that l is a type of Time, obfuscating the fact that it is really a Distance.

This finding represents a critical point where Einstein makes an important philosophical error: the objectification of motion [12]. This objectification occurs when he conceptually treats Time as Distance. This dual treatment of light-time as both a Time and a Distance is a key characteristic that forms the foundation of Relativity theory. This objectification and simultaneous treatment of l as both a Time and a Distance has gone undetected and has led theoretical physics astray for over a century.

3. Conclusion

Motion in Relativity theory differs from motion in Classical Mechanics because of differences in space-time geometry. Relativity requires that Einstein's transformed points form a spherical wave or a hypercone. We have previously shown that Einstein's 1905 derivation fails because the transformed points do not form a spherical wave. Here we have shown that Einstein's derivation does not produce a hypercone because a key variable, *light-time*, is actually a measurement of Distance and not a measurement of Time. Since the speed of light, c , is a Velocity, and t is a Time, then l in the equation $l = ct$ is a Distance. This mistake in the hypercone derivation has gone undetected because the statement where Einstein defines *light-time*, appears to be a simple substitution for convenience. In fact, when one mistreats c as a constant scalar rather than as a constant Velocity, this substitution mistake will go undetected.

Einstein's subsequent use of light-time, which is a Distance, as if it were a Time invalidates his derivation. Thus, we have shown that Relativity theory cannot be derived using either of the two geographic shapes Einstein asserts are created. Correcting the problems identified in Einstein's derivations leads to moving system theories that, for several experiments, produce more accurate results than the equations associated with Relativity theory [13, 14, 15, 16, 17].

References

- [1] S. Bryant, "The Failure of the Einstein-Lorentz Spherical Wave Proof", *Proceedings of the NPA* 8: 64 (Long Beach, CA, 2010).
- [2] S. Bryant, "Episode 22 Podcast / Conference Presentation - The Failure of Einstein's Spherical Wave Proof" (NPA Conference, Cal State - Long Beach, 2010), www.RelativityChallenge.com.
- [3] A. Einstein, *Annalen der Physik* 17: 891 (1905). (Original German version: http://www.wiley-vch.de/berlin/journals/adp/890_921.pdf, English translation: <http://www.fourmilab.ch/etexts/einstein/specrel/www/>, both in public domain).
- [4] M. Grabiak, personal e-mail correspondence
- [5] M. Brill, personal conversation
- [6] A. Einstein, *The Meaning of Relativity* (London: ElecBook, 1922).
- [7] A. Aho, M. Lam, R. Sethi, *Compilers, Principles, Techniques, & Tools*, 2nd Ed. (Addison Wesley, 2006).
- [8] R. Lischner, *C++ In A Nutshell*, 1st Ed. (O'Reilly, 2003).
- [9] Wikipedia, "Type Systems", http://en.wikipedia.org/wiki/Type_system (retr. 2011).
- [10] D. Flanagan, *Java In A Nutshell*, 3rd Ed. (O'Reilly, 1999).
- [11] Jet Propulsion Labs, "Mars Climate Orbiter Team Finds Likely Cause of Loss", (1999), <http://mars.jpl.nasa.gov/msp98/news/mco990930.html>.

- [12] G. Borchardt, "Einstein's Most Important Philosophical Error", *Proceedings of the NPA 8*: this volume (2011).
- [13] S. Bryant, "Revisiting the Ives-Stillwell Experiment", *Galilean Electrodynamics 19*: 75 (2008).
- [14] S. Bryant, "Revisiting the Michelson-Morley Experiment Reveals Earth Orbital Velocity of 30 km/s", *Galilean Electrodynamics 19*: 51 (2008).
- [15] S. Bryant, "Episode 18 - Part 2 - Comparative Analysis of Moving Systems Models" (NPA Conferences, University of New Mexico, 2008), www.RelativityChallenge.com.
- [16] S. Bryant, "Episode 20 Podcast - AAAS Conference Presentation - Averages, Rates, and Functions" (AAAS Conference, San Francisco State University, 2009), www.RelativityChallenge.com
- [17] S. Bryant, "Episode 19 Podcast - The Meaning of Moving Systems Models" (2010), www.RelativityChallenge.com.

Earth's Primeval Polar Heat

Dwardu Cardona
 Vancouver, BC, CANADA
 e-mail: dcardona@shaw.ca

The derivation of terrestrial life is said to have required a much greater amount of ultraviolet radiation than the Sun presently supplies. And yet the Sun is claimed to have been much dimmer at the very time life rose on Earth. The emergence of life is also said to have required vast electrical discharges, but the electric energy that Earth can produce through atmospheric lightning lacks the required potency to accomplish what is needed. The manner in which miles-deep glaciers accumulated during Earth's past ice ages has never been resolved. What is even worse is that lands within the Arctic circle had actually basked in warmth during these ice ages, as they continued to do in between these ages down into geologically recent times. Judging by what has been discovered in these northern latitudes, this warmth managed to sustain sub-tropical species of flora as well as fauna, species which are not presently able to thrive in those same regions. And as if that is not enough, newer discoveries continue to strengthen an older assumption that this sub-tropical life had appeared much earlier in Arctic regions than it did farther south. This is a situation that continued to maintain itself long after the continental plates are believed to have settled in their present configurations. As far-fetched as it might seem to most, this conundrum has led some paleontologists to a conclusion that flies in the face of what we know, or think we know, concerning the history of the Solar System.

1. Introduction

Odd scientific discoveries are reported every year. One recurring problem with most of them is that they are seldom correlated to one another. While there does not seem to be any lack of communication between whoever is responsible for them, there certainly seems to be a lack of integrating these discoveries with one another. Theories that have been derived from some of these discoveries have thus been offered in isolation. And the reason for this is the lack of a unifying hypothesis that could tie any of them in a comprehensive manner.

It has long, for instance, been surmised that the infant Sun during Earth's primordial epochs was only about 75% as bright, and therefore 75% as hot, as it is at present [1]. This lesser illumination accounts for the spindly nature and sparse foliage of Earth's first land-based plants, which give the impression that they had to struggle for whatever available dim light there was to nourish them [2]. It was not until the age of mammals, especially at the inception of the Paleocene period, that Earth's land areas engulfed themselves in a verdant profusion of subtropical plants.

The problem with this is that the inception of life on Earth is considered to have been reliant on high levels of ultraviolet radiation [3]. But how could Earth have basked in higher levels of ultraviolet radiation than at present when the ultraviolet radiat-

ing source, that is the Sun, is claimed to have been much dimmer than at present?

2. Primordial Sun

What I, with others, have been proposing is that Earth's primordial source of heat was not the present Sun. What sustained Earth was a much less massive dimmer brown dwarf star to which Earth had been bound as one of its satellites while traveling alone through space outside the demarcation of the Solar System. Yes, I agree, it is a theory that inspires nothing beyond disbelief. On the other hand, there have been too many discoveries in various disciplines which have baffled their discoverers, but which have fallen neatly into our bizarre theory.

As a satellite of a brown dwarf star, Earth's dim source of heat and light during its primordial age is automatically accounted for. At the same time, the high levels of ultraviolet radiation that was needed for the inception of life is amply met since it is known that brown dwarf stars emit highly in the ultraviolet spectrum [4].

What is bound to inspire even greater disbelief is the supposition that Earth was not in an equatorial orbit around its primordial sun. It was, instead, situated directly underneath its south pole, at the appropriate distance, but sharing the same axis of rotation. As seen from Earth, its primordial sun would never have been seen to rise or set. On the contrary, it would have been permanently stationed in Earth's north celestial pole. Had this