

Dr. Carl Zapffe's Epistemological Analysis Of Einstein's Theory Of Relativity

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1.0 Introduction

This paper investigates the ideas of Dr Carl Zapffe and his battle with the dogmatic belief in Einstein's theory of relativity. Previous papers have given an outline of the story. Here the objective is to look specifically at Zapffe's scientific ideas with emphasis on his idea of magneto spherically structured space.

One of the most irksome aspects of Einstein's special theory of relativity is that it was not really closely examined by the scientific community. It is true that there have been vociferous critics, but they were not present when the theory received the blessing of the physics establishment. In truth it is not exactly clear how this took place. It would seem that the theory was supported by Max Plank during its early years and that support combined with early apparent experimental confirmations led to its general acceptance by 1911. It would seem that the critics only appeared after this date, as the new theory became more widely known, and wide ranged criticism emerged in the following decade. However, the announcement of the eclipse results confirming general relativity gave the theory its grandest experimental validation, and from that time onward, critics were marginalized and generally ignored.

Some famous critics were Henry Bergson in the 1920s, Author Lovejoy, Herbert Ives, and Herbert Dingle in the 1930s, and then later after WWII in the 1950s and 1960s Herbert Dingle and Louis Essen opposed the theory, but it was well entrenched as scientific dogma by this time. In the late 1960s Carl Zapffe emerged as a critic, but by this time the controversies provoked by Herbert Dingle had hardened the relativistic dogma. Scientific journals rejected discussion of the theory, the door was now closed to criticism of relativity. Yet despite this Dr. Carl Zapffe labored on in his criticism of the theory. One objective of this paper will be to understand why Zapffe opposed the established dogma, and what he believed was the correct physical theory of space and time.

As Dr. Zapffe says in his memoir, "Unhappily for me, my original intention to go after these intriguing matters (problems in cosmology) has been sidetracked the past two decades trying to unravel the more fundamental question: Just how does one properly measure time and space?"

2.0 Approach To The Problem

The documentary basis for this study comes from two main sources. The first is a booklet which will be called simply "A Reminder". It is a paper back book memoir published and Copyrighted by Dr Zapffe, and published at his own expense. There are 209 pages. There is no publication date given, but it can be surmised to have been about 1982. The other source of this type is another, similar booklet, of 46 pages which will be called "Seven Short Essays". The other sources are published scientific journal papers. However, none of the journals is a highly respected scientific physics journal.

The author also has in his possession a number of physics books previously owned by Dr. Zapffe, which contain his handwritten comments in the margins. However, these are mainly interesting as entertaining remarks, and provide little historical information. They do show that he was critical of the relativity dogma of the physics establishment. It was these interesting remarks that originally provoked this writer to ask, who is this Dr. Zapffe? The answer discovered by the author, was that he was a critic of the established theory of relativity, who definitely knew what he was doing, even though no one seems to have supported his criticism during his lifetime.

2.1 Questions To Be Answered

The following questions present themselves and it will be an objective to answer them.

- What were the epistemological reasons for his criticism and rejection of relativity?
- What was the scientific basis for his rejection of the relativity theory?
- What specific model did Dr. Zapffe chose to advocate as a replacement for relativity?
- What were the reasons given by science journals for the refusal to accept Dr. Zapffe's papers?
- What was the result of Dr. Zapffe's criticism of relativity?

3.0 Objective And Thesis

The objective of this paper is to establish that the source of Dr. Carl Zapffe's criticism of modern relativistic physics is the persistent irksomeness of the theory and its claimed experimental validations. Here irksomeness is used to define a condition of contradiction, inconsistency, confusion, ambiguity, and obscurity. Simply put, a scientific theory is irksome when all of the facts supposed to be explained by the theory taken together with the experiments claimed to prove the theory just don't "add up". The books do not balance, and the conclusion must be that something is wrong with the theory or the experimental verifications. This is a less formal way of defining what Karl Popper required of a good scientific theory, that was that it should fit the facts well. The irksomeness factor in relativity not only arises because the experimental facts don't add up, but the theoretical interpretations don't add up as well. In a more formal terminology, we should say that Dr. Zapffe subjected Einstein's theory of relativity to an

epistemological investigation and found it failed the test, because it failed to demonstrate that it was an epistemologically sound theory. The objective of this paper will be to expound this conclusion as its thesis.

4.0 Philosophical Background

The philosophical background that is needed to advance the thesis stated in the objective, which is that Dr. Carl Zapffe's disowning of relativity resulted from an epistemological analysis that revealed irksome problems, is the philosophical field of epistemology. It is not the purpose of this paper to discuss this large field, but to simply state the different approaches to this problem that have been recommended by experts in the field. This gets us to a problem in scientific method.

The main problem in scientific epistemology is when a theory should be rejected. Opinions differ. The traditional scientific view is that a theory should only be rejected and replaced, when a better one comes along to replace it. Hence according to this view, it is incumbent upon the critic to provide a sufficiently correct alternative, so that the existing theory is not only fixed, it is significantly improved. This means not only removing the irksome difficulties, but providing a new, and ultimately more productive, theoretical understanding, so that the new theory predicts previously unknown new discoveries. These scientists are saying that they will not give up a known irksome theory, unless there is a new, and improved, non-irksome theory to replace it, that yields new knowledge. Basically this requirement is a source of dogmatic adherence to the old theory, no matter what. Most attempts at criticism are aimed at fixing the irksome problems by identification of them as a first step. This itself is a tall order, but to also provide a replacement theory that is better according to the new knowledge criterion is setting the bar way too high. As we will see Dr. Zapffe did attempt a solution, which satisfied this criterion, despite the fact that this was an extremely difficult task for anyone to accomplish.

A simpler approach advanced by Karl Popper is that the criterion is one of falsification in order to corroborate the theory. Popper stated we should constantly be testing what we accept as true knowledge, and that epistemology is the continual process of testing and checking and corroborating what we believe to be true, with the objective of proving it to be false, not of proving it to be true. Poppers argument is not used in scientific circles, which adhere to the old criterion that what is said must be proved true as the first principle, and that the objective of proving a falsification is not the method of science. Science rejects Popper's epistemological principle and requires that the critic must positively prove his alternative theory is true and not merely show that the old theory is irksomely false. So the critic must provide a new and better theory and it must withstand criticism of it as presented by its opponents. This is basically the situation which Dr. Zapffe faced in his criticism of relativity. He had to prove an alternate theory to be correct. Hence merely performing an epistemological analysis was not enough, he was required to propose and validate a superior alternative to Einstein's theory. This was of course an impossibility.

To see that this requirement is extremely difficult, if not simply impossible, to satisfy consider the problem involved. The critic of relativity is faced with two jobs, one to convince that his criticism is correct, and second to show that his replacement theory is correct. Meanwhile all a critic of these proposals has to do is simply refuse the proof of either of the two above cases. He doesn't have to prove his refusal to accept either of the proofs is justified, he merely has to refuse to accept it. Hence the problem with reviewers of scientific papers. They don't have to be right in what they say, but the writer of the paper does.

This requirement obviously reinforces proofs that accepted theories are correct and biases scientific journals against new theories, disproof of accepted theories, or criticism of accepted existing theories. Put differently, the practice of science is opposed to the critical examination of existing scientific theories by attempts at falsification as advocated by Popper, and uncritically accepts claimed proofs of accepted theories without examination. Hence established science opposes Poppers view of scientific validation. This of course means that scientific facts do not have to "add up" in Popper's sense of this meaning. Hence, we can see why the special theory of relativity continues to be promoted as true by the scientific establishment, they don't have any real reason to replace it, since for them, it is a valid scientific theory despite its demonstrable irksomeness.

4.1 Carl Zapffe's Theory Begins With Wonderment Of Nature And The Aurora

Like all great scientific ideas, Carl Zapffe's theory begins in the wonderment of nature. In his case the specific phenomenon that inspired was the aurora borealis, or northern lights which Carl viewed on his summer vacations to Minnesota. Unfortunately like all inspirations, when he attempted to put this into a specific scientific theory, there were problems. The main one being his idea simply did not resonate with the community of physicists who were trained in an entirely different way of thinking.

What Zapffe was doing was true natural philosophy in the long tradition from Aristotle. Natural philosophy begins in wonder and proceeds towards an understanding of nature through explanation. This explanation is constructed with a philosophical worldview, or ideas that facilitate the understanding of nature. Zapffe's new world view was different from the worldview of the physics community and his scientific ideas are a direct result of this difference.

Let us see if we can define this difference, by first attempting to say what the established worldview of physics is. This is not as easy as it seems, but for relativity it consists of the idea that there is no absolute space or time, within which physics can be discussed. Hence physics is the analysis of reference frames, which are mathematical idealizations. There is no reality to be assigned to them or to the ideas of space and time in any absolute sense. It is clear that Zapffe, who derived his ideas from a different view of the scientific world soon learned to doubt this relativistic idea of the world.

Putting these ideas into a more specific context, established physics sees our planet the earth spinning on its axis and revolving around the sun in a void or perfectly empty space. But this void space is a vague idea. Time as well is vague and ill defined, it is a purely human idea. Zapffe on the other hand sees the earth from the ecological viewpoint as spaceship earth, it consists of lithosphere, hydrosphere, atmosphere, ionosphere, and magnetosphere traveling as a compact isolated self contained package around the sun through space which is not empty or void but is alien to us humans. For Zapffe the aurora is the proof of this spaceship earth conception, since we can look up into the sky and see the dome of the earth's protective magnetosphere made visible. Inside the protective and isolated dome or capsule of the magnetosphere, we humans have our living environment, and that is defined by the structure of the encapsulating magnetosphere. This I think is the basic conception.

We can now much better appreciate the irony of Zapffe's NASA encounter. In Zapffe's view NASA had provided the evidence that proved this conception of spaceship earth encapsulated within its magnetosphere protective zone, but ultimately they rejected his ideas, as un-understandable. A result that Dr Zapffe thought was quite ironic.

From Zapffe's viewpoint the fundamental Michelson-Morley experiment is not a crisis in physics but a confirmation that the earth is a complete ecological system of physical fields, material structure and biological structure. For Zapffe the earth simply carries its own electromagnetic reference along as it travels through space. Isolated from surrounding influences, hence there was no basis for there to be a positive result in the Michelson-Morley measurement of earth velocity, and therefore there was no reason to claim this failure of measurement as a justification for Einstein's two postulates.

5.0 Brief Summary Of Dr. Zapffe's Argument

This section briefly summarizes the logical approach to the conclusion that relativity is flawed as expressed by Dr. Zapffe in his "A reminder". This exposition is a kind of historical document which describes the story in Dr Zapffe's own words.

5.1 "By way Of Introduction..."

He begins by telling the reader: "This booklet is essentially the result of two quite astonishing discoveries." The first was that Einstein had made an error and the second was that: "Professional relativists of the modern school do not want to hear about my discovery." Dr. Zapffe was astonished by both of these discoveries, but after laboring for many years to bring them to light he "decided to cease and desist in what is obviously a useless harangue." His book is the result of his decision to document his discoveries and return to his professional life as a metallurgist. "And that in a nut shell is what this booklet is all about."

5.2 "The Mystery Of Time: A Bit Of history"

“Because of the stunning sophistication of modern methods...a widespread feeling exists that at last we have this ancient puzzle of philosophers under control. But to define its measurement is not to define its nature. *Time* remains the greatest mystery in physics...the Einstein Era cut a mighty swath across the very center of this whole subject by raising grave questions regarding the very nature of time, as well as its measurement. Some of us do not like his answers...and when we confront the paradoxical situations incident to time dilation, a great certainty wells up within our breasts that the Special theory is not here to stay...the current generation seems to be living within the very center of a mighty intellectual maelstrom entitled *Decline and Fall of The Special Theory...*”

In “A Bit Of History”, Dr Zapffe introduces the reader to the fact that he is a trained metallurgist, “Metallurgy Is My Bit”. He informs the reader that his scientific world view is quite different from that of a typical physicist, astrophysicist, or astronomer trained in relativity physics. Because as a metallurgist. “to get to metals, one must go to mines, one needs to know considerable about geology”, as well as the lithosphere, hydrosphere, atmosphere, troposphere, stratosphere, ionosphere, and magnetosphere. About 1963, he developed an interest in astrophysics and cosmology as part of his wide ranging worldview education. But here he encountered a problem with time in the big bang cosmology, “Even if one grants that an “explosion” in four dimensions brings with it a concomitant expansion in the subspace, the corresponding explosive action along the *ict* time axis still confronts us with that serious philosophical question as to just what is “time“?”

Now he confronted the problem that, “Einstein’s Special Theory carried the fascinating proposition that, wherever an observer might be, and regardless of his state of motion relative to some signal emitting body, the Maxwellian field velocity c would always show an identical and fixed measurement. This essentially meant that any multiplicity of observers, in whatever state their motions might be relative to one another and to some given emitting body, would each enjoy the privilege of finding himself or herself centrosymmetric with respect to the spherical wavefront. Astonishing! What kind of geometry enables that?” This caused the key discovery as Dr Zapffe expressed in the following way: “When I soon thereafter found the literature in this field to record many dissenting voices, it occurred to me that Einstein was probably correct...He was simply ahead of his time...To my astonishment and considerable dismay, however, I found that this does not work out....Why did Einstein conclude it did?” This question sent Dr Zapffe on a “three year in depth study of the Special Theory...In short I read everything that Einstein himself could possibly have read...”

Unlike many others, who simply accept the mysterious conclusion of Einstein’s theory, Dr. Zapffe made himself into a critic of relativity by wanting to see the actual proof, or the fundamental reason why, what Einstein said was true. As with many other critics, Dr. Zapffe discovered the arguments were flawed, false and essentially unconvincing. For Dr. Zapffe the critical evidence that was missing related to the Michelson-Morley experiment as the crucial evidence for the need to introduce Einstein’s puzzling postulates.” Dr.

Zapffe refers to this experiment as a “null datum“, because it gave no positive result for the measurement of the Earth’s velocity through the aether of space, as it should have done. So it was a null result, or as Zapffe says a “null datum“. He uses this phrase many times in his work, as if it was presumed to be a known concept throughout physics. However, it is likely it was not, and his use of this term was probably a source of confusion for his readers.

Dr Zapffe could not accept Einstein’s argument. “Einstein...then found himself confronting the experimental null datum...proceeded, one might say in an act of intellectual desperation, to make a forced fit through processes of mathematical adjustment of the Galilean transformation used for mechanics...Einstein and all his compeers proceeded to interpret the results of electromagnetic sensors...in terms of a motion that just as obviously did not exist. For his “inertial frame“, yes; but for the electromagnetic-field frame proper to the electromagnetic experiments, positively no!” This in a nutshell, was Zapffe’s discovery and he called it Einstein’s error. Explained differently. Dr. Zapffe insisted that that null datum of the crucial experiments of relativity was being incorrectly interpreted, because the measuring instruments, which were presumed to be moving through an electromagnetic aether, were not actually moving through any aether at all because they were at rest on the earth, relative to its electromagnetic reference frame, as evidenced by the presence of the magnetosphere surrounding the earth.

This discovery was corroborated by other evidence against Einstein: “Worse, careful study of that famous 1905 paper finally disclosed no less than seven errors of mathematical and/or epistemological sort; and his two famed postulates were found to be phrased with such looseness as to conceal in fact as many as six.” By this point our hero, Dr. Zapffe, had become a confirmed critic of relativity.

As his next step he tells us, “I called upon the only mathematician I knew personally at the time, to inquire where I went wrong. The deeply etched memory of his completely blank expression remains with me to this day.” He began collecting his materials and wrote a rather long paper which he submitted for publication. This paper then evolved into his first booklet, the “Seven Short Essays. This was distributed at a colloquium in Waterloo, Canada on August 8, 1977. His paper was not well received, and he learned first hand the ire of his relativistic opponents. Further on, he describes his encounter with J. L. Synge, who called him a “cod“.

5.3 The Original Paper “A Reminder”

This paper appears reproduced in its original form for the edification of readers. It can probably be described as a contra-relativity textbook outline, since its basic plan is to shadow the usual presentation of relativistic textbooks, with the significant difference that it disagrees with the standard relativistic physics interpretation. One could view this paper as the alternative way to present physics, without the relativity hypothesis, but instead it is a criticism of why relativity is false. because of Dr. Zapffe’s strong historical orientation,

it reviews the important historical facts in light of the new historical model contra-Einstein. Since the discussion is quite lengthy, here we will attempt to reduce it to its essential minimum content.

The essential theme is to take the three main propositions of relativistic physics and show that they do uniquely depend upon the special theory, but that the special theory is merely incidental to them. The three physical concepts are Mass-Energy Equivalence, Relativistic Mass, and Elementary Particle decay. The format for addressing these topics is a formal historical review of the foundations of physics, beginning with Newtonian theory. This follows the way relativity textbooks do it, so it is only fair to examine their epistemological method and assumptions. The main argument is simply that the relativity theory is not required to explain these phenomena of physics.

The really unique and important contribution of this paper is a detailed historical review and discussion of the experiments relating to the evaluation of the applicability of the special relativity theory to the three topics considered. Dr Zapffe's argument is simply that the claimed evidence for experimental proof of the special theory follows only from the coincidental fact that the relativistic factor appears in these equations. However, as he points out this factor can also be due to the Lorentz aether theory and other factors. Hence he argues there is no compelling reason to claim the results prove or validate relativity.

5.4 Astronautic Interferometry- (1970)

This is an unpublished paper which gives a condensed version of Dr. Zapffe's argument. Its primary new feature is the proposal to do a definitive experiment to test the magnetospheric hypothesis. It is this experimental proposal that makes Dr. Zapffe's approach scientific as opposed to the pseudo-science of relativity, because the theory is proposed in a way that makes it subject to empirical verification. Hence the theory is based on a physical hypothesis, seeks to test that physical hypothesis, and proposes a method designed to test this hypothesis.

The salient feature of this paper is a statement of "The Einstein Error". Unfortunately the discussion is unfocused, vague, and rambling, a problem that surely would have been corrected in a final version eventually published. The main point is that Einstein failed to consider the possibility that the electromagnetic reference frame is an earth centered one and not a heliocentric one. Put differently, the null result of the Michelson-Morley experiment is readily explained by the model which assumes that the proper electromagnetic reference frame is the earth as evidenced by the magnetosphere.

This paper was rejected by a long list of scientific journals. Dr. Zapffe is careful to document this and even includes some of the rejection letters. In one of them the following statement appears, and Dr. Zapffe publishes it with an arrow pointing it out to the reader. It reads as follows: "Although the Special Theory of Relativity has continued to be used profitably for over 60 years, suggestions are made from time to time of an alternative theoretical interpretation of the Michelson-Morley experiment and other recent

experiments. These attempts remain profitless speculation until there is definite supporting evidence on lines like those which you have suggested or otherwise, that the existing theory does not account for the experimental facts.” Dr. Zapffe adds the aside comment, “Well?”

I am sure his puzzlement was just as great as the readers mystification regarding this statement, which seems to say that there is no point in doing experiments to investigate relativity until there are experimental results which suggest that relativity is false. If this seems to be a tautology to the reader, he can be certain that it most certainly is. The standard scientific answer to Dr. Zapffe’s proposal to subject Einstein’s special theory of relativity to an empirical test is that no such empirical test is needed, because there is no reason to suppose that the theory is false. This is simply pseudo-scientific double talk. They are saying, we don’t need to perform a scientific experimental test of relativity, because we already know it is true, based on the fact that there is no evidence to contradict this belief. Of course there isn’t, because you have refused to do the proposed experimental test of the theory.

Actually, the statement that there is no evidence to suppose relativity is false is not true. The Michelson-Gale and Sagnac experiments do contradict the theory, but that fact is simply ignored.

5.5 A Letter To The Editor Of Physics Today- (January 1972)

This letter, which was rejected, was another attempt to raise the awareness of the physics community to the problem of whether the Michelson-Morley experiment was properly interpreted as evidence for the relativity theory as Einstein claimed it to be. Its significance is that it gives a fairly clear, if wordy, explanation of his viewpoint. Zapffe writes: “...the magnetosphere belongs in relativistic physics...” and then points out that the third hypothesis of Michelson, that the aether was carried along by the earth, was rejected and not properly tested. He then makes the clear statement of his view that “...the Michelson-Morley interferometer, safely and securely embedded on the lithosphere hundreds of kilometers beneath the protecting electromagnetic wall, accordingly gave a null measurement for the relative velocity because there was none. No shocking schism with classical physics actually ever developed, except in the minds of those who insisted upon saving the “hard ball” Earth model even if it meant sacrificing classical physics.” By hard ball earth model, Zapffe means that the earth is simply a hard ball in empty space devoid of any magnetosphere, which moves through the heliocentric aether by brute force of its mechanical motion. In his comments at the end of this section, Zapffe states: “In my profession a null datum signifies a position of rest.”

5.6 Physical Models for The Lorentz Transformation and Einstein’s Special Theory- (1975)

This section is a letter submitted to the astronomy magazine Mercury, as a criticism of an article which appeared with the title “When Time Slows Down“. It consists of a criticism

of the relativistic idea that the speed of light is a constant. The following statement appears near the end of the long letter rejecting the relativistic model. “The position of the present writer is that the physical model has never been made clear because no relativist has yet paid attention to the magnetosphere, with its earth based coordinates, as sufficiently and precisely answering the famous “null datum” of the original Michelson-Morley interferometer upon which all of the relativistic physics is historically based. They seem never to have considered, for example the fine points in signal transmission which distinguish the carrying on of conversations within a jet aircraft as compared with similar attempts made out on the wing. The Lorentz transform was launched from the belief that the interferometer was out on the wing, when in reality it was within the compartment of the plane, as we now know thanks to Space-Age geophysics.” This letter was of course rejected.

5.7 Loose Thinking On The Velocity Of Light (1975)

This is a letter written in response to an editorial written by the American Physical Society. It is a well written and reasoned letter. The main point is the following statement: “Until that original and figmentary Einstein model of a “flying interferometer” be put to the actual test---an optical instrument in real motion relative to the rest coordinates of the physics holds no direct proof of the s called Second Postulate in its actual two-ended sense of light motion being independent of the motions of both emitter receiver.”

5.8 In Memoriam: Einstein - (July 1979)

This is a letter to science that was also rejected. It is a well written summary of his thesis. The main point is this: “Therefore every null datum cited by relativists in support of the special theory has done no more than prove by means of electrodynamic tests that the electromagnetic frame does indeed have geocentric rest coordinates.”

5.9 Space Isotropy -(July 1979)

This is an unpublished letter written to Physics Today pointing out that the Brilliet-Hall experiment really “was firmly at rest upon the terrestrial lithosphere while presuming to test the planetary velocity through interplanetary space....An inertial frame is neither sufficient for, nor suitable to, electrostatics.”

5.10 Message from Geophysics To Relativistic Physics- (December 1979)

This was a paper submitted to The American Physical Society. Zapffe writes: “Relativists should carefully review their own literature with this magnetospheric model in mind. For they can easily determine for themselves that no test in the entire history of experimental physics has even done anything other than prove the fact already known to geophysics, namely that a local geocentric rest frame obtains for electrostatics.”

5.11 Et Tu Bruto?- (1981)

This is a letter to his alma mater magazine, The Johns Hopkins magazine. It is basically a rebuttal of a letter published by that magazine. It is a rebuttal of many of the common flaws of relativity and is not presented as an academic argument. It was obvious from the rejection letter that the very simplified argument given in the letter was “too remote for the majority of our readers daily mindset...”

5.12 Michelson Centennial-(September 1980)

This was another letter submitted to Physics Today, and also rejected, that took advantage of the occasion of the Michelson Centennial. Zapffe repeats his previous argument and proposes the following: However, we do have astronauts today, and space vehicles which should be capable of mounting a type of optical instrument for testing that exceedingly crucial point of (c+/-v) velocities. What an immense occasion if interferometer fringes should indeed develop as Michelson so fully expected.”

5.13 The NASA

This section reports his frustrating attempt to interest NASA in his flying interferometer experiment.

5.14 Reflections On Fields

Here Dr. Zapffe gives a summing up. I call it his final statement. In it he says: “..having spoken my bit on relativity, I can return to metallurgy where I belong.” It is his final reflections on the topic.

6.0 Analysis Of The Zapffe Magnetospheric Model

One of the basic problems in reading Zapffe is that he mixes up his two objectives instead of presenting them as separate arguments. This follows from the fact that the two arguments are interconnected by his Magnetospheric model. This model is the basis for his argument that the special theory of relativity is epistemologically false because it fails to consider the possibility that the earth carries with it its own electromagnetic reference frame.

This argument of course assumes that the Magnetospheric model is correct, and of course the entrenched relativists did not accept this worldview as physically valid, because they were committed to the metaphysics of the void Minkowski space-time model. In committing themselves to this conception of space-time they were obviously unaware that it is un-understandable to critics of relativity. That is why they become critics of relativity, but relativists, convinced of their righteousness, are unable to understand this and label critics as crackpots. Turned around, the critics of relativity can not understand why relativists are unable to follow a logically valid argument that relativity is false. There is a perfect inability of both sides to make sense of the arguments of the other viewpoint, they were, and still are, un-understandable to each other. Before we can

proceed, we need to sort out this difficulty.

It is clear that Dr. Zapffe documented the difficulty and the fundamental problem. That was his second discovery, that physicists were not interested in knowing that Einstein's theory of relativity is false. This discovery is not really given the importance it deserves. What it demonstrates, and this is also demonstrated by the testimony of many other critics of relativity, is that Einstein's theory of relativity is not science but pseudo-science. More specifically, it is a metaphysics pretending to be a science. The critical factor in defining whether a so called science is scientific or not is: Can it be falsified? The answer from 100 years of experience in criticism of relativity, is that it is beyond criticism and can not be falsified by rational arguments or scientific experimentation. Hence it is simply not a scientific belief, and it is not science. Having clearly stated the difficulty, that belief in relativity is not a scientific belief, but a metaphysical prejudice, we can proceed to consider the epistemological problem and Zapffe's proposed solution. But very simply, Zapffe's magnetospheric model was a falsifiable scientific hypothesis, complete with a proposal to test the hypothesis via an experimental test.

6.1 Einstein And The Context Of Justification

In this section the actual role of the Michelson-Morley experiment will be discussed. We are used to talking about the null result of this experiment, or as Zapffe says, the null datum. This is really not the correct way to view it. The purpose was to measure the velocity of the earth and the result was that the earth's velocity is zero. I think this is why Zapffe says it is a null datum, the measured result is zero, rather than a null result which implies it is a theoretical test of the aether hypothesis, a null result, which it is not. There is nowhere in this experiment any attempt to empirically prove the existence of the aether as is claimed by relativists. The result simply shows that the velocity of the instrument relative to the aether frame is zero. A result completely consistent with the Stokes aether model. So the experiment can never be taken as any test of the existence of aether, because it only tests for the existence of the Fresnel aether and is fully consistent with the existence of the Stokes aether.

Since zero velocity result contradicted the Copernican hypothesis, because the earth is assumed to be moving, the result was a puzzle. The basis of the experiment was the hypothesis that the earth was in motion around the sun, according to Copernicus, and this motion was through a sun centered or heliocentric aether. This is known as Fresnel's theory. There was an alternative theory, known as Stokes theory, which asserted that the earth carried the aether with it as it revolved around the sun. So the experiment confirmed the Stokes theory as opposed to the Fresnel theory.

The physicist FitzGerald, suggested a hypothesis to explain the result consistent with the Fresnel theory. The hypothesis was that motion through the aether caused a physical contraction, and this would be consistent with the zero velocity result obtained. Lorentz developed this idea into a fairly complete electromagnetic theory. Poincare criticized the Lorentz theory and improved upon it and introduced the principle of relativity and

derived the Lorentz transformations which he named. In 1905 Einstein suggested the hypothesis that the nature of time was altered instead of physical space being contracted. There was no mention of the Michelson-Morley experiment.

In 1907, Einstein used the Michelson-Morley experiment to justify his principle of relativity. This was further developed in his 1910 and 1911 papers to the extent that it became the foundation of his theory, which he dubbed the theory of relativity in one of his later papers. This name stuck, although it appeared only many years after his first paper. The point here is that the experiment was claimed to be the foundation of the theory only many years after the theory had been first published. However, the textbooks used his later justification of the theory, based on the later papers, as if the experiment was an empirical foundation for the theory, which it definitely was not. Hence the theory was entirely an invention of Einstein's imagination, and it had no real empirical basis as he later tried to establish it.

Lorentz managed to convince Michelson that the Stokes aether theory was seriously flawed, and this left only the Fresnel aether theory and Einstein's relativity theory, which was basically Lorentz's aether theory without need of the aether hypothesis. Being based as it was on the idea that time was the reason for the velocity of light to always be constant irrespective of the velocity of the measuring instruments.

Einstein fully exploited the viewpoint that the Michelson-Morley null result was a test for the existence of the aether, since the Stokes aether model was discredited by Lorentz for theoretical reasons. Since there was no idea of a magnetosphere then, it was plausible according to this view, that there was no aether at all. This became accepted physics dogma, and its extension was that there was no such thing as absolute space, and the propaganda was produced that Newton's natural philosophy was invalidated, and this viewpoint became accepted physical philosophy. However, there was no real solid experimental evidence to support this opinion. It was all based on conjecture that the Michelson-Morley experiment proved that the aether, or absolute space, didn't really exist at all.

In later years Michelson began searching for evidence of the Stokes aether. Then Dayton Miller took up this project. Finally in 1928 Michelson and Gale measured the rotation of the earth relative to the Stokes aether, a result that should not have been possible if relativity were correct, since it contradicted the light constancy hypothesis. But by this time the relativity theory, and the belief that there was no absolute space, was accepted physics dogma, and the result was not attributed to be a refutation of relativity. In the end, it is clear that the Stokes aether model was vindicated, but this fact was ignored. Einstein had won the battle to justify his theory based on the empirical warrant of the Michelson-Morley experiment, although this interpretation was erroneous for the reason that it lacked definite empirical proof that the Stokes aether model was false, and that it had definitely been shown that this model was plausible as a result of the Michelson-Gale experiment. So even in the face of evidence to the contrary, the relativity theory had won the hearts and minds of the physics community.

6.2 Zapffe's Magnetospheric Theory Was A Scientific Hypothesis

The main point to understand is the following. Dr. Zapffe's analysis had revealed an epistemological flaw in the accepted textbook version of Einstein's special theory of relativity, and Dr. Zapffe proposed an alternative explanation based upon his magnetospheric hypothesis, along with a proposal to test this hypothesis. Hence the Zapffe model was a scientific hypothesis because it formulated a specifically testable hypothesis, as an alternative hypothesis to the textbook explanation of the experimental foundation of Einstein's special theory of relativity. Dr. Zapffe's hypothesis was scientific because it could be falsified by the experiment, while the special of relativity, is and continues to be, scientifically un-falsifiable, as proved by 100 years of criticism that has been unscientifically rejected.

The Zapffe argument is simply this. There is no reason to identify the mechanical reference frame of the sun with the electromagnetic reference frame for near-earth electromagnetic propagation. The fundamental claim made by Zapffe is "that terrestrial electrodynamics has terrestrial rest coordinates". It is a rather astounding fact that all experiments are consistent with this viewpoint of physics, but the physics community refuses this conclusion and adds that there is no experimental evidence to contradict relativity.

Zapffe's proposal was simple one. That was to test this hypothesis of the equivalence ,or identity, of the electromagnetic and terrestrial rest coordinates, by placing an interferometer in outer space so it is in motion relative to the terrestrial coordinate system. This experiment has never been done.

7.0 Criticism Of Dr Zapffe's Proposed Magnetospheric Model

This section takes a look at some of the criticism of Zapffe's arguments and inquires as to their reasoning. As mentioned above, a referee critic does not need to be right in his evaluation , merely refuse to accept the thesis of the writer.

Probably the most common criticism and reason given for rejection of one of Zapffe's papers was the following simplistic and easy justification: "Not suitable". There is also the rather easy responsibility shift: "Our feeling is that your arguments should be reviewed by a specialized journal whose referees are in a position to judge the correctness of your position." This last statement is rather a puzzle, since it is admitting the editors are not competent. One would think it an easy task to respond by suggesting that the submission be pared down to its essential arguments and eliminate anything that might be considered questionable. So this is really just another excuse for rejection.

The only real discussion and criticism that is historically accessible is the comments to a paper published in *Speculations in science and Technology*, Vol. 2, No. 4, (1979) pages 455 to 485. They include criticisms and Dr. Zapffe's answers to the criticisms.

The first criticism, which Dr. Zapffe answers, is that he didn't consider "that Maxwell's equations are Lorentz invariant, but not Galilean-invariant." Dr. Zapffe answers this by a reiteration of his proposed model. He restates his thesis: "...no experiment in the history of physics has yet tested an optical instrument in real motion relative to the magnetospheric rest coordinates and found a null datum." This is not really an answer, Zapffe doesn't have one, his thesis is that there is an empirical gap in the evidence that needs to be rectified. Obviously this needs to be the first order of business, but that is not the way scientists behave.

Reviewer A, Z.L. Budrikis, makes the comment that: "Dr Zapffe does not offer much of an argument for his own thesis, thereby almost intimating that it should be a self evident proposition." This reviewer then goes on to discuss why the theory is wrong in the details and hence should be rejected. The reviewer then makes the rather strange suggestion that the argument should be based on the ionosphere rather than the magnetosphere. In the end he seems to agree with the Zapffe thesis that the geocentric frame is the correct frame for near earth electromagnetism. These comments are valid, but not on the mark. The question is this: Is there a gap in the empirical evidence?

Reviewer B. Allen D. Allen makes the odd criticism that NASA does not observe the effects required by Dr Zapffe's theory. The criticism is based upon the ballistic theory of light and not the aether theory of light. He requests Zapffe to explain something that is not inconsistent with his theory based on the false assumption that Zapffe advocates the ballistic theory of light.

In this writer's opinion, all that can be determined from these criticisms of Dr Zapffe's theory is that there is a real problem for anyone who attempts to introduce a new idea into physics. The essential claim is the following. That is that the essential empirical warrant for the special theory of relativity is epistemologically false. It is not necessary to prove an alternative theory, only to show that there is a gap in the claimed empirical evidence. All that is required is to demonstrate the gap. Yet Dr. Zapffe is required to prove his alternative hypothesis before his proposed experiment to eliminate the omission in empirical knowledge is to be conducted. This is basically a tautology. If one can prove the theory is true without the experiment, then there is no need to do the proposed experiment. But the critics require that Zapffe prove his theory to be correct before they will agree that the experiment is needed to be performed. This really makes no sense as science, and shows that science is not actually the objective of these men who claim to be scientists.

8.0 Conclusion

In the previous sections all of the questions posed in section 2.1 were answered but the last one. This was to ask what was the result of Zapffe's criticism of relativity. The answer is yet to be determined. It is clear that there was no positive response to his arguments in his own lifetime, and there was been no attempt to do his proposed flying interferometer experiment. However, the reader can change this outcome by thinking about this problem. There certainly is a gap in our empirical knowledge that effects the empirical foundations of the special theory of relativity. We need to ask ourselves if we want to continue with this incomplete state of empirical knowledge of physics.