

**An Introduction To Dr. Carl A. Zapffe's Classic Paper:
A Reminder on $E=mc^2$, $m=m_0(1-v^2/c^2)^{-1/2}$, & $N=N_0e^{-t/\gamma\tau}$
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Introduction

A brief introduction to the work of Dr. Carl A. Zapffe was contained in a short paper previously published by this author. It should be read in conjunction with this paper as it provides biographical and other background information.

This paper serves as an invitation to read Dr. Zapffe's classic analysis of the experimental basis of the special theory of relativity, which he published at his own expense in a 1982 book with the title A Reminder on $E=mc^2$, $m=m_0(1-v^2/c^2)^{-1/2}$, & $N=N_0e^{-t/\gamma\tau}$. Being a privately published book, few copies were printed, and its distribution was limited. Today it is an obscure and rare book.

I am pleased to announce that the heirs of Dr. Carl A. Zapffe have given permission to republish material, copyrighted by Dr. Zapffe, in the General Science Journal. This material is provided verbatim in its original form as scanned into PDF format. It is the work of Dr. Carl A. Zapffe, and has his copyright notices. Users should take notice of this when using this material provided by the General Science Journal.

Background

Dr. Zapffe's friend, Jack Graham has graciously provided copies of the material used here. He noted that "Carl was astonished that his insights were so fiercely resisted in his time by establishment science...He had lots of rejections based on false pretexts but he still managed to publish a lot of quality material... When I was a young man, I used to sit at the end of the dock on Gull Lake in northern Minnesota during the late evening hours, as Carl smoked a cigar and contemplated the northern lights. That became the basis of his subsequent work on Einstein, and his notion of an experiment with a flying interferometer in outer space beyond the magnetosphere... Carl was quite an interesting fellow, regarded as somewhat of an odd duck as he was, yet generally respected as he deserved. If Zapffe lacked social skills, at least he had a sense of humor, and the relativists with whom he dealt certainly had no charm at all."

Overview Of Dr. Zapffe's "A Reminder..."

Why was Dr. Zapffe's work so fiercely resisted? The answer lies in the thesis which Dr. Zapffe expresses regarding Einstein and his special theory of relativity. That thesis, which

is not explicitly stated by him, can be summarized as follows. Dr Zapffe argued that the empirical evidence, which was claimed to validate the special theory of relativity, was erroneously interpreted and that there was in fact no actual conclusive experimental evidence in support of Einstein's speculative theory.

This thesis, appearing as it did towards the end of the 1960s, came on the heels of the bitter arguments over the twins paradox and Dingle's strenuous attack upon the theoretical foundation of the theory. The science establishment had just barely saved the theory from these challenges to its credibility when Dr. Zapffe initiated his scathing criticism of the experimental justification of the theory.

As a practicing research scientist he was clearly more qualified than the ivory tower theoretical physicists to judge of the credibility of the experimental evidence, but they ignored his analysis. This strategy had been very effective in the past, although they could not silence Dingle who was giving them fits--he was persistent. Dr. zapffe was an easy problem, although an established metallurgist, he was not a theoretical physicist, it was easy to refuse to publish his papers. Today we are lucky to be able to study Dr. Zapffe's analysis of the experimental justification for the special theory of relativity which is contained in "A reminder...". This paper represents the mature fruition of Dr. Zapffe's work on special relativity.

The approach is as follows. In the first part he demonstrates that the famous mass-energy equivalence equation $E=mc^2$, does not necessarily follow from the special theory of relativity. He demonstrates that the conclusion was derived before the advent of that theory based upon completely different assumptions and line of physical reasoning. A detailed historical analysis is provided to support the argument.

In the second part a similar analysis is performed on the principle of mass increase with velocity. An historical analysis is used to show that this principle also does not follow of necessity from the special theory of relativity. In this part the thesis that the earth is the local electromagnetic rest frame is presented. He asserts that it is "the earth's magnetosphere" which is "the locally absolute rest frame for all experimentation in electromagnetics conducted within its confines". This analysis completely destroys the justification of Einstein's two postulates as the foundation of the special theory. A detailed historical analysis is presented to support the argument.

The fourth part discusses the foundations of relativistic physics. This is certainly required reading for anyone who believes himself to be educated on the subject of relativity. Recently Richard Kadel published a letter in which he urged that Einstein's postulates be called Einstein's laws. His failure to understand the historic foundations of relativity made that letter an embarrassment. Physicists should not make pronouncements regarding relativity unless they understand what they are talking about. Hence a clear historical knowledge of the theory is a necessity. Dr. Zapffe clearly explains this, but it is not the establishment viewpoint. It is a must read.

The fifth part discusses the justification for the particle decay law. Dr. Zapffe shows that this law has no theoretical or experimental justification to be linked to special relativity time dilation. The historical analysis is certainly eye opening.

In the sixth part, there is an analysis of Einstein's explanation of the twins paradox in general relativity. It is astounding and certainly revealing in its insights.

Summary

Dr. Zapffe clearly demonstrates that the claimed experimental support for the special theory of relativity is based upon erroneous interpretation of experiments such those of Michelson-Morley and Kennedy-Thorndyke. He goes further in his analysis to show that the claimed experimental support for the theory does not demonstrate that the theory is valid out of necessity, but that it may be valid through sufficiency. What this means is explained as follows. When an experimental confirmation follows by necessity, it is demonstrated that the theory upon which the experiment is based requires the experimental result to follow from necessity and can not follow from the truth of any other theory or premise. Hence the result is true by necessity, since no other true result can follow from the experimental assumptions. Dr. Zapffe clearly demonstrates through his historical and mathematical analysis, that the experimental basis of the theory of relativity follows only through sufficiency. This means that the theory may be true as proved by experiment, but there are other just as valid alternative theories which can provide the same true experimental result. When this conclusion is combined with the fact that there are experiments which clearly contradict the special theory of relativity, that theory can not be maintained as valid based upon the experimental evidence. Hence, we see that Dr. Zapffe rejects the special theory of relativity as invalid based upon his analysis of the experimental justification of that theory contained in his paper.