# 1 0

This is going to be a long road. For me it began in 1956 when I first discovered the work of Alfred North Whithead, and decided I would become a mathematician. In that direction I soon began to discover all his work, in particular Aims of Education Science and the Modern World, From there I learned the quandary that science had gotten into, both the triumph since Newton in particular, and then Maxwell, and then how it all turned upside-down when those two approaches seemed to be in conflict which was only resolved when Einstein cam up with the Theory of Relativity which showed that "measurement of space" and "measurement of time" were not compatible.

# 2 0Goff

Personally at that time (I was about to enter college life as a freshman at Rice Institute, to become an electrical engineer I imagined. However I encountered the world of Bruce Goff, which changed my personal destinyprofoundly.
After two years at Rice I left school and began developing my own ideas. I soon encountered three vital works of Whitehead Concept of Nature Principles of Natural Knowlwedge Principle of Relativity.
The first two I avidly absorbed, but the third was not available no matter where I tried to find it (the "web" did not then exist. I learned from a librarian at the "Linda Hall Library" in Kansas City that the only copy in the US was in the New York Public Library, and I resolved to some day go there and learn for myself what it said.
In 1960 on my first visit to New York I did spend the afternoon in a reading room avidly trying to copy things from that book, and a librarian there told me of a bookseller in London who could perhaps find me a copy. When we returned to Barlesville I (with Mr, Goff's help) contacted that bookseller who did find me a copy. So finally I began to learn the detail of the problem

# 3 Congruence and Measurement-von Staudt

`https://en.wikipedia.org/wiki/Karl_Georg_Christian_von_Staudt` His "algebra of throws" provided the first defiition of distance that did not depend on a prior agreement as to its meaning, but is based only upon geometric congruence, Thus it allowed us to discuss what space might mean without any need to be able to discuss its possible content.

# 4 missing part of von Staudt's approach

`https://en.wikipedia.org/wiki/Separation_relation` Axioms were needed to show that the "real numbers" needed for filling the detail of space were sooon added.

## 5 Grassmann and Algebra

https://en.wikipedia.org/wiki/Hermann_Grassmann The work of this gentleman proved to be far superior to the vector and tensor mathematics that became "du rigeur", as has been acknowledged by mathematicians and physicists universally.
Whitehead, of course, was adamant about its importance in his "Universal Albebra" and planned to base the 4th volume of Principia mathematicae" on Grassman's approach.

## 6 now we know Grassmann was right

https://www.maa.org/sites/default/files/pdf/upload_library/22/Ford/DesmondFearnleySander.pdf A marvelous explication of the lack of understanding of linear algebra and the strenghts of the correct approach developed long agp by Grassmann.

## 7 another missed opportunity

https://www.ams.org/journals/bull/1972-78-05/S0002-9904-1972-12971-9/S0002-9904-1972-12971-9.pdf A well-known paper by phycicist Freeman Dyson pointing out the opportunity that physics missed by not adopting Grassman's work early on. Dyson of course missed himself an opportunity of realizing Whitehead also developed a very strong theory of relativity.

## 8 6