

RELATIVISM VERSUS RATIONALISM

THE TIME CONCEPT

By F Harrison Stamper

This is an answer to Prof. W.H. McCrea as an additional rebuttal to his argument with Prof. Herbert Dingle recently culminated by NATURE Magazine. See April 28th and Sept 29th 1956 Issues.

The noose is gradually being drawn tight by those who agree with Dr. Dingle that time cannot be given a unique status in a relativity theory. The Rational Theory (F Harrison Stamper 1954 and prior) comes to the aid of Dr Dingle with additional evidence against the McCrea philosophy which is representative of that of the Relativity (Einsteinian) camp.

By going beyond Dr Dingle the Rational Theory makes proposals which are required to make Dr Dingle's position tenable and Dr McCrea's attack null although the former does not realize that this is so.

Rotational and accelerated motion are given a complete relativity status under the Rational Theory and only in this way can it (The Relativity Theory) be absolved of any absolute and unique frames which the latter has used to explain away paradoxes with respect to time which have been generated because of the existence of a physical time (duration). The Relativity Theory has set up a straw man in its time concept and then knocked it over again by explaining away the paradox by use of an absolute frame.

The General Theory of Relativity is a MATHEMATICAL THEORY and one has only to turn to the recent denunciation of mathematicians for their taking over Relativity by G Burniston Brown in Science Progress Magazine (October 1956 issue). He did not specifically mention the time concept in his diatribe but there is probably no greater default of the Relativity Theory than in this single concept. In plain language-understood by most college students-it is plainly a case of simple "fudging". One can only accuse Dr Dingle and Dr Brown of not using forceful enough language. They have been entirely too kind to those who have subverted what started out to be a generalization of Galilean relativity.

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A CASE AGAINST THE THEORY OF RELATIVITY

THE TIME CONCEPT

AS SEEN BY THE RATIONAL THEORY

INTRODUCTION

One has accused those who champion the Relativity Theory of dwelling in a land of fantasy. But it takes more than an accusation to prove one's point and so this article is presented to show that one's contention is correct.

Time has been given two different natures by the opposing parties to the great debate and one is again entering on the side of Dr Herbert Dingle and in opposition to Dr W.H. McCrea to prove the former's point although he needs little support. But there is always another side of the issue, which a third party can present as additional evidence and make it more convincing. This comes down through the Rational Theory which was developed some years ago and which is only now being actively promoted as a new theory. Its concepts agree with that of Dr. Dingle.

And so the Rational Theory may be the answer to a subject that is very nebulous with a consequence that a rational answer has been very difficult to find. If only the trivial facts are evaluated then one arrives at a certain answer viz McCrea's but a deeper analysis requires a change of viewpoint which contrary to snap judgment only apparently conflicts with what might be called the strict mathematical treatment of the subject-matter. So one makes the accusation that the mathematician who blindly follows his symbols without accompanying physical analysis cannot expect to reach the peak of his endeavors.

SPATIAL COORDINATES

Simplicity is a factor in every debate. No one can accuse either Dr McCrea or Dr Dingle of being complex in their phrasing and illustration of the concepts which they respectively pursue. One knows that the debate is over the time duration experienced by each of twins one of whom stays at rest on the earth while the other takes a roundtrip in a hi-speed rocket ship to some distant point. Dingle contends that their life intervals are congruent, in other words that they age together from beginning to end of the trip this concept upon an interpretation of lack of simultaneity which classes it as a defect in method of measurement based upon the presence of physical phenomena. McCrea gives full play to the mathematics which on its face would require time interval to be concrete, something that could not disappear and would add up like a lot of oranges. Because the mathematical formula is so specific on this point and one accept it as the correct premise then one could believe that the fountain of youth had really been found if one believes in the future of space-ships. For McCrea finds that the twin returning is younger than his counterpart who stayed on earth.

As one wishes to present this article for the layman as well as the scientist it was decided to make a research among various books that were adapted to the language of the former and was surprised to find a quotation admirably fitted to aid the Rational cause. From Van de Kamp's "Basic Astronomy" comes the following illuminating language:

"Romer found that the terrestrial clock and the Jupiter clock did not agree but that there was a periodic annual change in rate which can be described as follows. During half of the year the Earth approached Jupiter while during the other half of the year the Earth and Jupiter drew further away from each other. Romer's observation showed that compared with his clock the Jupiter clock ran fast while the Earth was approaching Jupiter but has a slow rate when the Earth was retreating; the accumulated effect amounting to about a quarter of an hour either way. Now it was

impossible to accept such a large irregularity in the Jupiter satellite clockwork or in any existing terrestrial precision clockwork, Romer concluded that another effect overlooked till then was responsible. It takes time for us to see what has happened in the Jupiter system as it takes time for cosmic events to be reached on Earth. This explains the respective "fast" and "slow" rates in the Jupiter satellite mechanism. In other words, the light messages are not received instantaneously, but only after some time—the time it takes for light to travel from Jupiter to the Earth.

From the foregoing one cannot be rational and not conclude that space acts to give a lack of simultaneity of clock measurements because of time aberration. We know that if it were not that light has to traverse the expanse between opposite points of the Earth's orbit there would be no differential apparent defect. We would not necessarily know that if the earth stopped at one point in space whether there would still be a defect as outlined above. It is only that the eclipses of Jupiter's moons were influenced by the differential distance that light had to travel when the earth was nearest to Jupiter and when it was furthest away that permitted Romer to conclude that the defect was due to the velocity of light and so assuming Newton's gravitational law and thus the correct period of the satellites he was able to work backwards and calculate the speed of light.

This should be a lesson for the McCreans for it shows that although clock times are not simultaneous yet if in case of Jupiter one could take a single position in space then the differential lack of simultaneity would disappear and it is believed that all rational people would concur in this contention. If one can remove what would appear on its surface to be a major defect just by movement of the observer then duration must necessarily be a fiction in the way assumed by Dingle. If there were not men like Romer where would true science be to-day? It must be admitted that in case of space coordinates the problem is very simple in light of present day intellect or better learning but still we must not fool ourselves into believing that Nature is fundamentally complicated. Perturbations, man-made complications are the source of our troubles and if one only has sufficient power of diagnosis one sees through these defects if given sufficient time. Unfortunately a goodly portion of our training has been to follow our geniuses and those who have been able, often by hook or crook, to gain control over their fellow man. The Relativity Theory is a good example where in spite of obvious defects it has been carried to the pinnacle of success by finally being called "classical". If man's mind had not been blinded by the word genius then a rational answer could have been obtained years ago.

TIME IN INERTIAL FRAMES

Although the effects become much more complicated, in reality one needs only take a simple step from the preceding to find out what happens in inertial frames. If one is at rest in a given frame and observes phenomena in a frame that is moving at a uniform velocity with respect to the frame at rest then one sees that the distance is continuously varying so its effect upon a cyclic system would be different than the above given. This is the effect of the variable x in the Lorentz transformation equation for time. In case of space measurements with the systems assumed at rest one does not become involved with "warping" that exists because of the relative motion of frames involved. One can get a good book that explains the reason for the warping such as Durell's "Readable Relativity" but this should not blind one to the similarity with the simple space problem. In either case time must be defined as a cyclic "beat" and in either case time is influenced in a similar way by space measurements which must be accomplished with the aid of light projection. If we could make direct measurements we would be working in proper space and there would be no need to adjust and synchronize our clocks as to frequency and phase displacements.

To repeat, the conclusion to be drawn is that the cyclic beat of clocks such as the revolution of the satellites of Jupiter are affected by external causes which give apparent deviations of these clocks from their true time obtained if one were a "proper" observer of the clock system. The observer "on the spot" is the only one that finds a time that fits into his calculations to give him an answer to agree with the empirical end-points. It is observation from afar, or under different physical conditions that belie one's calculations and make adjustments necessary. The Lorentz equations permit such adjustments but the whole of science would be a fantasy if it were not that Nature has given the scientist a working tool in that values at rest, and not influenced by phenomenal causes, are equal. If the same mass was different in value to different observers under the same conditions then science would be in a sorry state. But it might be noted that this is what the McCreans propose for if the clocks of the twins were not the same even in phase relationship, then there would be two clocks at the same place for one observer and each time a clock was taken on a tour it would have to be re-synchronized by turning its hands to bring it to the same time as its counterpart. Thus taking the proposal of the McCreans as a sample one wonders as to the rationality of the rest of their theory. One must judge the entire theory by such comparisons. But remember we are talking about a "classical theory" and one that has been in existence for fifty years, so after such an elapse of time one can be highly critical.

THE DEFINITION OF TIME

From what has been written in the foregoing, it should be possible to make an assessment as to the true nature of time. At least we should know that time does not "flow" as stipulated by the Newtonian Theory. Thus physiological time—that assessed by the individual to comply with his senses—which is Newtonian time, would never fit into a relativity theory.

But now one makes the accusation against the Relativist that he has followed in paths of Newton, although he would protest this very much. The truth of the matter is that when they assume that duration is an entity as they do in treating the twin paradox, then they are making time "flow" and they are in fact becoming Absolutivists.

In contrast, time is entirely relative in the Rational Theory, for it is dependent on the observer, and duration becomes the duration of the observer when clocks are returned to his frame. So one can now give a definition of time. TIME IS JUST A MEASURE OF UNIFORMITY. This definition was given by the Rational Theory some years ago but its truth is even now more apparent. THE VELOCITY OF LIGHT IS THE ONLY UNIFORM MEASURING ROD IN THE UNIVERSE AND 'CT' IS THUS THE ONLY UNIT QUANTITY THAT CAN BE USED FOR MEASURING SPACE. For this reason rather than a fourth dimension is the true reason why 'ct' enters into so many equations. This is why 'ct' is isotropic although it is velocity-sensitive to the vehicle velocity.

This definition of light gives the reason it does not "flow" either in the sense of the Newtonians or the Relativist. Except when there is a velocity in an observer's frame or other entering phenomena the velocity of light is a constant, for transformations are only required to maintain this constancy when there is a relative velocity present.

DOES AN ABSOLUTE INERTIAL FRAME EXIST?

Whereas the Rational Theory propounds complete relativity of motion of both the uniform and accelerated type and even extends such relativity to gravitation with the principle of equivalence the Relativist stipulates the existence of an absolute frame in the body "alpha". Now they will dispute the point, but if one turns to their arguments relative to the twin paradox, the point is immediately made apparent. Relativity books such as Moller's give the procedure and McCrea's arguments make this conclusion inevitable. His very statement that it depends upon which body has the motive power in relative motion gives him away as to his ideas on the subject. This would condemn the whole idea of relativity as one should be able to see.

TIME TRANSFORMATIONS

The Rational Theory presents the thesis that time transformations are symmetrical which prevents any observer from being unique. In the Relativity Theory the observer, fixed in reference to "body alpha" is given a unique status. One has only to turn to Moller or to McCrea's exposition to confirm this statement. The latter's solution to the clock paradox is contingent on the ability of their mathematics to give a unique statement of time duration to the twin who remains on Earth, for his time flows in what might be called a Newtonian manner. The other twin always comes out with a shorter time duration so that on his return he is always younger than the twin who remained. In fact the Relativist has to make his mathematics come out so, because he believes that duration is an entity and literally flows, and the paradox would continue to exist with his interpretation unless he did something to make one twin have an advantage over the other. Not so in case of the Rational Theory, because duration does not flow and each twin may consider that the other's duration is different while in motion but on coming to rest relative to each other the durations become simultaneous, because a clock once synchronized in a frame of the observer does not change time on a roundtrip, but only apparently does so, and, if the observer at rest partakes of the motion he finds that the synchronized clock which left him to go on a trip has remained in proper time, which can only be explained by the fact that the interpretation of the behavior of clocks must be conditioned on lack of synchronization rather than on a physical attribute of the clock to change time. Thus it is claimed that extended or projected time is the only time that is defective and this interpretation agrees with the story given of Romer and Jupiter's satellite.

RELATIVITY OR ABSOLUTIVITY?

So one must stress the fact that we are dealing with a relativity theory. One would not be so confident in his cause if he did not have both the logic behind a relativity theory on his side as well as the equations which go with that logic. The Relativist, ^{is} trying to fight the very logic of his theory by trying to make a certain ^{frame} unique which means that the frame is absolute.

The fight between Dingle and McCrea thus boils down to the question as to whether the relativity theory will be of complete relativity or one of a mixture of relativity and absolutivity. Remember the absolutivity of the observer does not enter into the question for it must be presumed that any observer individually has a preferred position. How could it be otherwise regardless of what theory one had? This last statement does not make an absolutivity theory out of a relativity theory but is only a statement made out the facts of Nature that all rest masses, times, etc, are absolute (equal to another). The absence of the latter phenomena would make science into a fiction devoid of any meaning.

CONCLUSION

With only a relatively small number of facts presented to explain the position of Dr Dingle and the writer, it is still believed that enough has been given to give any rational person an insight into the problem and show him if he were formerly an abject Relativist, that the expounders of his theory are on dangerous grounds. Because of certain preconceived ideas they have propounded a theory which is only partially a relativity theory. There cannot be any unique frames in a true relativity theory, and when such a status is given to the observer on Earth which is only temporarily privileged by the fact that it is our abode then one has the right to question the whole philosophy upon which the Relativity Theory is built. In substance the Theory is correct as a logical extension of Galilean Relativity but when it departs from that thesis then one can only see the introduction of "ad hoc" concepts to give effect to preconceived notions. The Rational Theory is introduced to bring relativity back to its original foundation, and make some miscellaneous corrections to the Theory.