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Open Letter: von Mettenheim to Zahar

Christoph von Mettenheim
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Editors' Note

*This is the text of an Open Letter from Dr. Christoph von Mettenheim to Dr. Elie Zahar, relating to Dr. von Mettenheim's earlier article **Einstein, Popper and the Theory of Relativity** (von Mettenheim 1996).*

Open Letter: von Mettenheim to Zahar

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18 Jan 1997

Dear Dr. Zahar,

Thank you for your letter of December 13, 1996. Since the 1995 Annual Popper Conference we have now exchanged six letters (three on each side). My impression is that you are feeling somewhat tired of this correspondence, and I admit that I, too, am at a loss how to make progress.

I was eager to discuss my views with someone who is competent in the field of the theory of relativity, and you ought to be competent. If one who has published a large volume on 'Einstein's Revolution' (Zahar 1989) cannot answer my arguments, then who can? But the problem, as I see it, is that *you simply will not face these arguments*. In the paper which I read at the conference I had explicitly challenged *anyone* to disprove my arguments in writing (von Mettenheim 1996, par. 34). It does you credit that you accepted the challenge. But my impression is that now, in our correspondence, which has been going on for one whole year, *you either evade my arguments, or you misrepresent them*.

Since you were quick to criticize my paper (which you had known in advance) at the conference, and accused me of not having understood the theory of relativity, I think it would now be only fair to make the result of this correspondence known in public. Your criticism, coming from someone who had done extensive work on the theory of relativity, made considerable impression with the audience, and not exactly to my favour. And you publish articles on Popper's theories in volumes which sell by using Popper's name. Readers of such volumes must believe you to be a 'Popperian'. But if you are, then intellectual honesty, which Sir Karl has demanded so urgently in his writings, should compel you either to answer by *arguments* (and not rely on authority), or to admit that you are mistaken.

This is why I intend to submit this letter for publication in **The Critical Rationalist** on the Internet, where the papers of the Annual Popper Conferences are being published. And I would appreciate it if you take the

opportunity for submitting a corresponding resumé from your side. As I see it, the present status of our correspondence, can be summed up like this:

1. I asked you what the Special Theory of Relativity (STR)—or the General Theory (GTR) if you prefer—will do with a definition of time complying with the principles of *methodological nominalism* as postulated by Karl Popper in chapters 3 & 11 of ‘The Open Society’ (Popper 1966). The following *Gedankenexperiment* will explain my position.

In a nominalistic definition we can define the term ‘time’ by the motion of the earth relative to the sun, taking, for instance, Greenwich, England, as the zero-meridian. Assume a satellite carrying a clock on board and circumnavigating the earth once in 24 hours, crossing the zero meridian exactly when the sun reaches its zenith at Greenwich, and define this point as ‘12 o’clock’. Will STR (or GTR, if you prefer) predict a time difference for the satellite on its next orbit? In that case it would be contradictory because we have *defined* the zenith of the sun at Greenwich to be ‘12 o’clock’. Or will it *not* predict a time difference for the satellite? In that case it has been empirically refuted by the experiment carried out by Hafele and Keating, who *observed* time differences in both directions.

You never answered this argument in your letters. You always *pre-supposed* your “relativistic” concept of ‘time’ without accepting my nominalistic definition. But even if your concept of ‘relative time’ were right, you should nevertheless tell me what I should do with mine.

Until you do, I still contend that the theory of relativity has been *empirically refuted* by the Hafele/Keating experiment. And because it is wrong in either case, I contend that it starts from a wrong *approach* to the problems of physics. I think nobody has ever seen that the conventional measurement of ‘time’ by the motion of the earth relative to the sun, which has, incidentally, proved expedient for thousands of years, for instance in the navigation of ships, serves, in fact, as a *nominalistic definition*, while the “relativistic” concept of ‘time’, according to which every system carries its own time with it, is, in truth, an *essentialistic* concept.

2. I argued that Einstein’s explanation of the redshift of light coming from distant stars has been empirically refuted by the discovery of the Hubble effect.

Einstein explained the redshift as being *caused by the gravitational field* of the celestial body from which light is coming to us. According to this explanation the redshift would therefore have to be a *function of inert mass*. But Hubble’s observations (which have been confirmed many

times since) show that the redshift will be the stronger, the greater the distance of the celestial body from which the light comes. Therefore the redshift is, in fact, a *function of distance*.

You did not answer this argument which I repeated in two letters. Instead, you referred me to Professor Derek Lawden's book 'An Introduction to Tensor Calculus, Relativity and Cosmology' (Lawden 1982).

I think referring to books is not a good substitute for arguments in a written correspondence. But I have Lawden's book lying before me while writing this. There is *not a word* of my argument in that book. You did not answer it—so I still contend that the explanation of the redshift by GTR has been empirically refuted.

3. I have pointed out that *for logical reasons* GTR is unable to describe circular or elliptic movements as they occur, for instance, in the orbits of planets, or of satellites.

Such movements consist *per definitionem* in an exact repetition of space coordinates. Therefore the *only* distinction between different events on these orbits lies in the time coordinates. Any theory permitting more than one time function for one set of space coordinates, which GTR does, cannot, therefore, develop formulae describing circular or elliptic motion. I challenged you to give an exact formula for such motion in terms of GTR.

You did not answer this argument. You did not even mention it in your letter. So I still contend that GTR is *incapable* of describing even such a simple situation as the orbit of a satellite, let alone the orbits of our planetary system. This implies that GTR is *entirely useless*, indeed only misleading.

4. In your book 'Einstein's Revolution' (Zahar 1989) you assume an "increase of content through translation into a mathematical language" (your words, p. 35 ff.).

I have pointed out in our correspondence that this assumption, too, is incompatible with Popper's principle of *methodological nominalism*. Translation, I think, can only lead to an "increase of content" if it is a bad translation.

After first trying to explain your assumption by the difference between 'pure mathematics' and 'applied mathematics' (your letter of 18 August 1996) you now say in your last letter: "However, if one physically interprets hitherto uninterpreted mathematical symbols, some statements which until now were mere *syntactical* consequences of some hypothesis may become *empirically meaningful*" (my italics for your underlining).

To me this shows clearly that you have never realized the implications of Popper's methodological nominalism. What you call 'interpretation' cannot be anything but the (uncontrolled) introduction of new empirical information. If terms, or concepts, or symbols, have no meaning of their own, but only that which we give them, as Alfred Tarski and Karl Popper have shown, then they cannot be interpreted. They can only convey the information which we have given them first. Unless, of course, you disagree with methodological nominalism. But in that case, I think, you should say so explicitly, and put forward your arguments, if you have any. Until you do, I must assume that Einstein's theories, and your interpretation of them, *rest on a fundamental misunderstanding of the rôle of logic, and mathematics, in science.*

Dear Dr. Zahar, I hope you will not resent my putting this pressure on you by submitting this letter for publication in **The Critical Rationalist**. But the theory of relativity is of general interest. It should therefore be discussed openly and, if possible, in a clear language. The arguments which might be used against it should also be discussed openly. As for me, I still look forward to reading your arguments.

With best wishes for the New Year, and kind regards,
yours sincerely,

Christoph von Mettenheim.

References

- Lawden, D. F. (1982), *An Introduction to Tensor Calculus, Relativity and Cosmology*, John Wiley & Sons.
- Popper, K. (1966), *The Open Society and Its Enemies*, Routledge & Kegan Paul.
- von Mettenheim, C. (1996), 'Einstein, Popper and the Theory of Relativity', *The Critical Rationalist* **1**(3).
URL: <http://www.eeng.dcu.ie/~tkpw/tcr/volume-01/number-03>
- Zahar, E. (1989), *Einstein's Revolution : A Study in Heuristic*, Open Court.

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