Translation into English: Chapter 2 - Catalogue of Errors for Both Theories of Relativity

from the German documentation of G.O. Mueller

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V: Motives for Generation and Preservation / Error No. 3

The mathematicians in particular were obliged to draw attention to the limitations of the mathematical speculations in the field of physics, though in fact they did just the opposite

If a completely untenable scientific theory can be enforced and maintained, the motives of generation and enforcement must be irrational.

- Pagels (1985, p. 106) saw the STR as a catastrophe for physics and he asked many critics: "How could that happen?" In answering the question with two Planck quotations he gives proof of his judgement that the failure of the mathematicians had made a decisive contribution to the catastrophe (p. 106):

"The fact that the STR has now been accepted for more than seven decades as a 'fundamental theory' - this is something that the philosophers, physicists and mathematician are jointly responsible for. Nevertheless, one has to see the mathematician as the major offenders - after all, 'relativistic mathematics' was repeatedly the last bastion which the relativistic theorists could fall back on if they were put under pressure by the criticism.

"Anyone who nevertheless can't shake off the idea that the theory of relativity is suffering from some internal contradiction should bear in mind that a theory the complete content of which can be propounded in a mathematical formula can contradict itself no more than two different conclusions derived from the said formula can. Our perceptions must, after all, adapt themselves to the results of the formula, and not the other way round' (Planck, 1933, 169).

'That the theory of relativity is logically incontestable is simply a consequence of the fact that ist mathematical formulations contain no contradictions' (Planck, 1932). The mathematicians were therefore particularly obliged to check the 'relativistic mathematics' - but they didn't. Instead they even keenly participated in 'relativistic mathematics' themselves (Minkowski, Weyl, etc.).

The mathematicians have therefore failed, and that pitifully."

The "relativistic mathematics" apostrophized by Pagels is, as proven by Pagels and other critics, verifiably a mathematics with incorrect physical meaning. There is no such thing in physics as a mathematics without meaning. The mathematicians should have ensured that the correct physical meanings of the formulae and of the measurements were deployed – but didn't. - The motive, if this can be one, was irresponsibility.

However, the criticism of the mathematicians made by Pagels must be greatly intensified. Another factor to be considered is the sense of power, as a mathematician to have conquered another discipline and to control it unconditionally; physics as an occupied territory. Minkowski's lecture (1908)

contains several revealing statements in this connection, cited from the 1958 reprint (p. 57): "Three-dimensional geometry becomes a chapter of fourdimensional physics." Whereby one must remember that four-dimensional physics exists only on paper. One cannot set up any device in it or make any measurements. (p. 60): "To stride over the concept of space in such a way can probably only be assessed as a piece of daring mathematical culture." The awareness of the aspect of daring was therefore indeed present with the occupiers. (p. 62): "In order to demonstrate that the assumption of the group [...] for laws of physics never leads anywhere to contradictions, it is unavoidable that a revision of the entire field of physics be undertaken on the basis of the preconditions of this

group."

One must be clear, here, just what Minkowski sees as "unavoidable": in order to show that a mathematical construction is non-contradictory, the entire (!) field of physics must be revised. This is easy for a mathematician to demand, because physics has no meaning for him. If someone demanded, in order to show that a physical assumption was noncontradictory, that the entire field of mathematics be revised, Minkowski would probably have started brooding.

The inhabitants of the occupied territory, the physicists, have celebrated the occupation and would preferably themselves have become mathematicians. They would only have been completely satisfied with a physics solely on paper. An occupation can scarcely be more successful. Nevertheless; the exercising of power in the field of physics is an irrational motive.

Minkowski, Hermann: Raum und Zeit : Lecture, 80. Naturforscher-Vers., Köln 1908, 21st Sept. In: Naturforschende Gesellschaft, Cöln. Verhandlungen. 80. 1909, pp 4-9. Also in: Physikalische Zeitschrift. 20. 1909, pp 104-111. Reprinted in: Das Relativitätsprinzip. Lorentz, Einstein, Minkowski. 6th edition. 1958, pp 54-66. - Pagels, Kurt: Mathematische Kritik der Speziellen Relativitätstheorie. 2., bound edition, Oberwil b. Zug: Kugler, 1985. 112 pages. 1st edition 1983.