

Early reception of relativity theory by physicists in interwar Czechoslovakia

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A fierce debate on relativity theory opened in Czechoslovakia after the review of Einstein's *Meaning of Relativity* (1923) appeared in *Časopis pro pěstování matematiky a fysiky* (*Journal for the Cultivation of Mathematics and Physics*) in 1924, written by Brno professor of theoretical physics Bohumil Hostinský (1884–1951). It was accompanied by a disclaimer written by another renowned Czech physicist, František Závíška (1879–1945). The positions of the two physicists remained unchanged for years, but while Závíška was joined in his defense of relativity by Arnošt Dittrich (1878–1959) and František Nachtikal (1875–1939), Hostinský remained alone in his rejection. In my contribution, I look at the debate through the lens of articles and discussions published in the philosophical journal *Ruch filosofický* and the membership journal of the Union of Czechoslovak Mathematicians and Physicists, *Časopis pro pěstování matematiky a fysiky*.

Keywords: History of relativity theory; history of physics in Czechoslovakia; reception of relativity theory.

1. Introduction

Both special and general theory of relativity were, broadly speaking, warmly received by most leading Czech physicists. In the following, I focus on the the debate that was instigated by the publication of Einstein's 1921 Princeton lectures.⁵ Apart from the negative review of the book published by a professor of physics, a number of other people expressed their low opinion of Einstein's theory. These negative reactions, however, were boldly rejected by the physics and philosophy professors. Their defense of Einstein included strong words and reveals their contempt for Einstein's critics.

2. Local setting and early reactions

Two facts are often mentioned in connection with relativity theory and its reception by Czech physicists: first, it is Einstein's professorship in Prague (1911–1912) and second, the latent influence of Ernst Mach (1838–1916), a professor of experimental physics in Prague from 1867 to 1895.⁹ However, when Einstein was in Prague, there were two universities in Prague, a Czech one and a German one, with little mutual communication,⁹ which is often stated as the reason for little actual face-to-face communication between Einstein and Czech physicists.

Special theory of relativity was first explained in courses of theoretical physics held at the universities in Prague.¹² At the Czech university, physics professors seem to have been too busy or too cautious about relativity theory, but although

the professor of physics at the Czech university in Prague František Kolářek (1851–1913) was cautious about accepting relativity theory (and other new theories in the early twentieth century), the Privatdozent František Závíška (1879–1945), working at the same department, introduced a course on it in winter term 1910/1911, even before Einstein came to Prague.

At the German university in Prague, the first official courses on relativity were given only by Einstein's successor, Philipp Frank (1884–1966), who gave a regular course in relativity theory since summer 1914.

The university courses undoubtedly contributed to the spreading of Einstein's ideas among students, but there was also the older generation, of varied levels of education in physics, that was to be informed about the new theory or whose mild or significant complaints about the new theory were to be dealt with.

One of those who popularized relativity was the physicist Arnošt Dittrich. In 1913, he held a lecture on the theory in two parts presented on May 3 and May 31. These lectures were published¹ in the membership journal of the Union of Czechoslovak Mathematicians and Physicists, *Časopis pro pěstování matematiky a fyziky* (Journal for the Cultivation of Mathematics and Physics). In his two lectures, Dittrich not only explained the basics of relativity theory, but also attempted to show how geometry was connected with physics. The tone of the Dittrich's lecture is persuasive rather than fighting. That, however, quickly changed with the response elicited by the publication of Einstein's Princeton lectures.

3. After publication of *Meaning of Relativity* (1922)

The German version Einstein's *Meaning of Relativity*⁵ was extensively reviewed⁷ by Bohuslav Hostinský, professor of theoretical physics at Masaryk University in Brno. His long review was critical throughout, ending with a note that probably brought up an open fight between him and the supporters of relativity theory:⁷ "Should anything of Einstein's theories hold, it will be necessary to rework them completely, and namely in such manner that mathematical exactness would be more important than Mach's philosophy."

Such a negative review could not have been left unanswered by the physicist who held the first lectures on relativity theory in Prague even before Einstein came to Prague in January 1911, František Závíška. In the same issue of the journal, he tried to negate Hostinský's criticism: he tried to show that the objections to relativity theory raised by Hostinský were based mainly on serious errors, while mildly criticizing him for taking a rather short popular text as a basis for criticism rather than the body of publications on relativity theory that had emerged by early 1920s. At the end of his reaction, he even unintentionally, between the lines of his comment, defend Einstein as a person:¹⁶

"H. says about Einstein that he is too conceited. It is not my task to defend Einstein personally, but hopefully I will be allowed to say this: when judging Einstein's theory, both sides exaggerated, those who defended it as well as those who

rejected it; I, however, found too much conceitedness with those who rejected Einstein's theory without having invested at least some effort into trying to understand at least the basics of it."

Arnošt Dittrich defended Einstein's theory just as vigorously² in his reaction to a book by J. Zbořil.¹⁷ The physics teacher Zbořil was apparently also rather critical of Einstein, which is suggested already by the title of his book *Einstein's theory in the light of the truth*. Here are Dittrich's words used to defend Einstein:² "You are advising Einstein to leave the scene, but that is what he has done already, following the nasty letters that were started by the German reviews of the same dubious quality as yours."

These short reactions depict the fierce tone of the ensuing debate, mainly between Hostinský, finding faults with relativity theory, and Czech physicists defending relativity theory, Závíška, Dittrich, and Nachtikal. They were also joined by Vorovka, a philosopher of mathematics.

4. Philosophical take on relativity theory

The mathematician and philosopher of science Karel Vorovka presented¹³ a view that Einstein's relativity theory is a proof that philosophy can contribute to the development in physics. As editor in chief of the journal, Vorovka joined the debate started by Dittrich's review of Zbořil's book with a fierce remark,¹⁴ defending, among other things, Dittrich's right to use irony in his criticism.

Vorovka also pointed out that a number of obscure booklets fighting against relativity theory was being published around the world with one common flaw, namely that their authors had not taken the time to read and understand Einstein's reasoning. In this respect, he is in accord with the objection Závíška raised against Hostinský. Vorovka even suggested that the Union of Czech Mathematicians and Physicists should open a counseling service for everybody wishing to disprove Einstein's theory. Alas, he said, such an initiative would be too costly, assuming that there would be many people in need of help, and it was not clear who would finance this. At the end of the article, Vorovka gave the following example to show the opponents of relativity theory how mistaken they were: if children write on the sleeve with their noses, we scold them for the *relative* movement that they have caused and we do not ask whether this was caused by the movement of the arm or the neck.

5. Misunderstanding Einstein's Theory

The positions of the two groups, one represented by Hostinský and the other by the three physicists, Dittrich, Nachtikal, and Závíška, did not change significantly in the few following years. In 1926, Hostinský published another article criticizing relativity theory, this time in the philosophical journal *Ruch filosofický*.⁸ His negative article elicited prompt and piercing response from two of the other three. Dittrich

responded in a very expressive tone, remarking that “Mr. Hostinský, a professor of theoretical physics at Masaryk University, still has not understood the main principles of relativity theory.”⁴ Dittrich referred to Závíška’s earlier explanation of the matter on the pages of the journal *Časopis pro pěstování matematiky a fyziky*.¹⁶ Nachtikal’s comment¹¹ was no less biting, pointing out even mistakes in Hostinský’s reasoning.

Ultimately, Hostinský’s response to Dittrich and Nachtikal, published in the same issue, accompanied by further clarifications by Dittrich and Nachtikal and complemented by a short note from the editorial board of *Ruch filosofický*, praising the contribution of Dittrich and Nachtikal, damped the debate for some time, with neither side changing their position.

The defense of Einstein’s theory was never personal, but always scientific. The arguments of the astronomer Arnošt Dittrich were rooted in his own work on relativity theory and astronomy, whose first papers on the topic were published in 1902 and 1904.¹⁰ Závíška’s reactions, on the other hand, were firmly grounded in his knowledge of relativity theory as he attempted to describe it to the public in his book.¹⁵

Relativity theory was also early on connected with research in geometry. In the Czech setting, Dittrich was the first one to explore the connection, but since he did not hold an influential position, his work is often overlooked. In the mid 1920s, Závíška in¹⁵ promised to combine his efforts with the geometer Václav Hlavatý (1894–1969) and write a joint book combining relativity theory and geometry, but this book never appeared, although Hlavatý in his book on non-euclidean geometry amply refers to relativity theory.⁶

6. Conclusion

The reception of Einstein’s relativity theory in Czechoslovakia was not completely straightforward, but it seems from the discussion that those defending it were in a comfortable majority, with just a single opponent from the rank of physics professors. The fact that Einstein was a professor of physics at the German University in Prague for 18 months (from January 1911 to June 1912) is well known and often referred to by Czech physicists; however, since the first lectures on relativity theory were held in Prague even before Einstein’s arrival, it had probably not played a role in the rather warm and welcome reception of relativity theory by Czech physicists.

While the old physics professors in Prague were cautious in accepting or rejecting relativity theory, thus not offering an authoritative view on the new theory to their young colleagues, the younger generation engaged in a fierce fight. The supporters of relativity theory in the Czech lands also seem to have been informed very well about the public debates on relativity theory in Germany, which is reflected in their emphatic reactions.

In the overall picture, it seems that adverse reactions to relativity theory were not present among university professors of physics, with the exception of Hostinský;

and this was despite the fact that the scientific focus of most Czech physicists was other than the relativity theory.

Acknowledgments

This work was supported by Czech Science Foundation (GAČR) grant (*Mathematics, Physics, and Politics: the Life and Work of Václav Hlavatý (1894-1969) in the International Context*), reg. no. 15-11070S.

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