

IN APPRECIATION OF THE WORK OF ALEXANDRE FRODA

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After I began work on the foundations of classical mechanics with J.C.C. McKinsey in 1951, I became aware of the important contributions to the foundations of classical mechanics by Alexandre Froda. I did not learn about his early work until McKinsey and I had already published several papers.

However, when Leon Henkin, Alfred Tarski and I organized in 1956 an International Symposium on the Axiomatic Method with Special Reference to Geometry and Physics, we invited Froda to be a principal speaker on the foundations of physics. The Symposium was held in Berkeley from December 26, 1957 to January 4, 1958. Unfortunately Froda was not permitted by the Roumanian government to come to the Symposium.

We did, however, publish his paper, *La Finitude en Mecanique Classique, ses Axiomes and leurs Implications*, in the Proceedings of the Symposium, edited by the three organizers and published by North Holland Publishing Co. in 1959.

Froda's paper reflected work begun in his earlier book on the foundations of classical mechanics published in Roumanian in 1952. It was this earlier book that made me aware of his work. As he indicated in his Symposium paper he worked in the tradition of Herz, Mach and Hamel, with acknowledgments also to Appell and Zoretti.

What is important and still quite modern in its viewpoint about Froda's work in mechanics

is its emphasis on constructive and finitistic methods, a subject more or less neglected in the tradition of classical analysis and classical applied mathematics, especially in terms of foundational consideration of explicit axioms of mechanics.

The axioms of finitude that he introduced in his Symposium paper were these, formulated only intuitively and informally here:

- I. The forces acting on a mechanical system should be bounded.
- II. The forces which produce a movement should not change their their orientation an infinite number of times in a finite time interval.

In connection with the first axiom he also dicusses the problem of infinite forces in classical particle mechanics, such as those produced by an inverse square law of attraction. It is worth noting that the paradoxical features of such laws still plague modern quantum mechanics.

In conclusion it is fair to say that the significance of Froda's fundamental contributions to the foundations of classical mechanics were not appreciated as much as they should have been. Especially his interest in constructive problems of finitude, although implicit in much actual working practice in physics and applied mathematics, was not fully appreciated, in spite of the interest in such questions in the foundations of mathematics several decades earlier. The problems he dealt with continue to be of current interest.