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Dear Professor Faryad:

This is in response to your request of 18 July 2016 for my opinion of the quality, competence, and general scholarship of the Ph.D. Thesis of Mr. Václav Špilla.

The Thesis is entitled: "Thermokinetic model and quantitative description of magmatic textures." The subject matter concerns the overall crystallization history of silicate magmas, which is a subject that I have been concerned for over forty years. Moreover, it explicitly involves the nucleation and growth of crystals in such systems that can be described by the methods of Crystal Size Distribution theory, or CSD theory, which I was instrumental in introducing to this field of igneous petrology. This is only to say that I am intimately familiar with all aspects of the present Thesis and have seen, and sometimes reviewed, the already published papers comprising most of this Thesis.

In brief, the final record of magmatic crystallization found in rocks records a detailed history of crystal nucleation and growth in response to the spatial variations in cooling experienced by the body of magma. In order to unlock and understand this record, a comprehensive theory is needed to model the intricate interplay between the kinetics of crystallization and the spatial variations of cooling within the body of magma. CSD theory, as initially borrowed from engineering, allows this to be done using a series of differential equations, but the technique is not simple as it involves a thorough knowledge of mathematics, chemistry and geology (petrology). And it is absolutely critical to apply this knowledge in the correct fashion, with the correct boundary conditions, so that Nature is properly portrayed. Both forward and reverse modeling is necessary, along with realistic cooling and rheological models, in order to achieve meaningful results. A good portion of the foundations for this type of work has been furnished by my own work and that of my students and associates.

On all accounts and in every phase of the present work, one descriptive word comes to mind: Magnificent. This is simply an absolutely first class piece of scientific research. Not only does it accurately portray the existing state of the field but also lifts the field to new levels of understanding. Needless to say, I enthusiastically support the defense of this work and the awarding of the Ph.D. degree. This work adds luster to your institution. Bravo! to Mr. Špilla.

Sincerely yours,

Bruce D. Marsh
Professor Emeritus