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September 10, 2018

Doctor of Science Evaluation Committee
St. Petersburg State University
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Subject: Skutschas Dissertation Review for Candidacy of Doctor of Science

To the Dissertation Committee:

It is my pleasure to provide a review of Dr. Pavel P. Skutschas' summary of his doctoral dissertation for his candidacy of Doctor of Science. Dr. Skutschas is a trusted colleague of mine and of others in the field of vertebrate paleontology. He is a careful scientist whom I have known and occasionally interacted with beginning in 2012. He has provided me with helpful formal and informal feedback of my work on fossil salamanders. Dr. Skutschas has a strong and growing publication record that exemplifies his research interests, which, in part, is summarized in his dissertation summary entitled *Early stages in the evolution of salamanders (Lissamphibia, Caudata) and the transition from stem- to crown-group salamanders*. His summary is a prime example of how he employs multiple research strategies to improving our understanding of the early evolution of salamanders and their closest allies and demonstrates his ranking as one of the leading scientists on that topic.

The global fossil record of early stem- and crown-group salamanders (i.e., Caudata and Urodela, respectively), particularly from the Mesozoic, largely is based on disarticulated, isolated, and fragmentary remains. As such, reconstructing their evolutionary history often is difficult and requires detailed anatomical, comparative, and phylogenetic methodologies to place them more confidently in the tree of life. Dr. Skutschas' work, as highlighted in his dissertation summary, employs these and other methodologies such as bone histology, X-ray computed microtomography, and paleobiogeographic and community-level analyses to provide a broader understanding of the early evolutionary history of salamanders and their life habits (e.g., feeding strategies). Furthermore, he participates in or is affiliated with others who have conducted the necessary paleontological field work in twelve geologic units of Middle Asia, Kazakhstan, and Siberia. These units preserve some of the oldest and basal-most members of Caudata (e.g., *Kokartus* from the middle Jurassic of Kyrgyzstan) as well as some of the oldest and most primitive members of modern salamander families (e.g., the possible proteid "*Bishara backa*" from the upper Cretaceous Bostobe Formation of Kazakhstan), both, of which, Dr. Skutschas has investigated. Thus, Dr. Skutschas' research program is ideally suited for tackling questions aimed at unraveling the early evolutionary history of salamanders, their morphological transition to more modern clades (e.g., Proteidae), and who they share their batrachian ancestry with. More broadly, his work, for example, has addressed hypotheses regarding the mode of salamander evolution (e.g., through neoteny), body size evolution in stem- to crown-group salamanders, and

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their ecological role in the fossil communities in which they evolved (e.g., aquatic bottom-dwelling suction feeders).

As addressed above and given Dr. Pavel P. Skutschas' past and continued scientific efforts and success in the field of vertebrate paleontology, I fully support him in being awarded the degree of Doctor of Science.

I thank you for the opportunity to review this dissertation and if you have any further questions or concerns, please do not hesitate to contact me.

Sincerely,

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