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-- To whom it may concern --
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Date
13.10.2022

**Examiner's report
of the thesis**

**“GEOCHEMICAL INDICATION OF LANDSCAPE-CLIMATIC EVENTS AND ANTHROPOGENIC
ACTIVITY DURING THE LATE PLEISTOCENE-HOLOCENE ON THE SITES OF PREHISTORICAL
PEOPLE OF EASTERN EUROPE”**

for the Doctor degree in geological and mineralogical sciences

Scientific specialty 1.6.4.

Mineralogy, Crystallography. Geochemistry, Geochemical searches of minerals

It is a pleasure to write this recommendation letter for acceptance of the degree of candidate of geological and mineralogical sciences submitted by Marianna Alexeevna Kulkova.

At first, I would like to clarify that I do not know Ms. Kulkova in person and will thus be able to only judge her written performance.

At least since the last 10 years Ms. Kulkova's research is very interdisciplinary and focuses on transformational processes in a wide array of societal formations and environmental settings. She studied transformations in societies occurring on different temporal, spatial and social scales during later Pleistocene and Holocene. By exploring past environmental and archaeological archives with the aid of high quality archaeological and paleo-environmental methods and at different landscapes as well as social constellations, she was able to detect the socio-environmental dimension of transformations.

In her thesis Ms. Kulkova decided to group her research themes and notions in four groups with continuous increasing complexity:

- (1) Geochemical investigations help to reveal landscape-paleoclimatic conditions, including the changes with time at the archaeological sites of different geographical zones of Eastern Europe.
- (2) Generalization of mineralogical and geochemical investigations of sediments at those investigated sites help to reveal global climatic events and their correlations with the rapid climatic cycles.
- (3) With the aid of multidimensional mathematical statistics to process the large geochemical data set, both lithological and anthropogenic components of sediments as well as finds on the archaeological sites can be used to even spatially distinguish living, household, and crafting zones at the ancient settlements.
- (4) By using information of landscape paleoclimatic conditions and the anthropogenic activity not only regional climatic chronological schemes but also a global paleoclimatic reconstruction for the Later Pleistocene-Holocene are possible to get developed.

Combination of the results of all themes and notions, respectively, allowed Ms. Kulkova to create a complete picture regarding the material culture as well as the social, economic, and ideological aspects of societies in the studied settlements that lead to cultural and historical transformations.

The publication record of Ms. Kulkova speaks for itself regarding her highly interdisciplinary approach as well as the high quality of her research.

Within the last 10 years Ms. Kulkova published as lead author or co-author 39 peer-reviewed articles in internationally well-recognized journals.

In addition, she published 2 monographs in Russian and 2 in English about scientific methods in archaeology, neolithic radiocarbon chronology, cultural relations and development of natural environments of Eastern Europe. In one of the monographs she even was one of the editors.

Further, she is author of four teaching books in Russian on chronological methods, applied geochemical research methods to reveal paleo landscape, adaptation of ancient communities to environmental changes in the Holocene, as well as on geoarchaeological problems of the Upper Dnieper and Western Dvina (Western Russia).

Ms. Kulkova should be granted the award of Doctor of Geological and Mineralogical Sciences Scientific at St. Petersburg State University - specialty 1.6.4. Mineralogy, Crystallography. Geochemistry, Geochemical searches of minerals.

With kind regards,



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