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State of stratigraphic knowledge of Quaternary deposits in European Russia: Unresolved issues and challenges for further research

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ABSTRACT

The paper is devoted to summary and analysis of the Quaternary stratigraphic investigations and state of the stratigraphic schemes of the different regions of the European part of Russia.

The previous summary on the Quaternary of Russia was done in 1984. Thus, this paper presents a brief analysis of the state of the Quaternary investigations in European Russia for the first time since last 30 years. Paper describes history of the Quaternary investigations of the European Russia as well as zoning (structural-facies zones) of the territory in correlation with the conditions of the Quaternary sedimentation. Summary of the Quaternary deposits developed in each zone and validity of stratigraphic units as well as state of the Regional Quaternary schemes is given for each structural-facies zone. Regional schemes are correlated with units of the General Stratgraphic chart of Russia and with International Chart. Analysis of the stratigraphic knowledge on the Quaternary deposits in various structural-facies zones in the European part of Russia has enabled to formulate the unresolved and discussable points and direction for the future investigations of the Quaternary studies. 1. Due to the change of boundary between the Neogene and Quaternary systems and involvement of the Palaeopleistocene stage in the Quaternary, stratigraphic horizons in this interval require additional study, and the most representative sequences should be selected as unit stratotypes for different zones. 2. In the areas of ice cover, various opinions on the age and number of glacial horizons in the Upper-Middle Neopleistocene, their distribution boundaries are still debatable. 3. In some areas and regions (Fore-Caucasus, Caucasus, Urals, Black Sea), differentiation of continental deposits is poorly substantiated by fauna. Their stratification is based on palaeoclimatic reconstructions, geomorphological analysis, and comparison with substantiated by fauna marine sequences of Ponto-Caspian Sea or continental sequences in the Fore-Urals and Western Siberia. Here, the most urgent task is to search for and study sequences in the transitional zone incorporating continental, ingressive, and marine sediments. 4. Development of regional charts for the Quaternary is relevant for the Caucasus, the Black Sea coast regions.

1. Introduction

European Russia is part of Russia geographically related to Eastern Europe: its eastern border runs along the eastern piedmont of the Ural Mountains and the Ural River, the southern border is the Caspian Sea and the Caucasus Mountains (Greater Caucasus Range) where is state border with Georgia, Azerbaijan, and Kazakhstan; the western border aligns with state border between Russia and Ukraine, Poland, Lithuania, Belarus, Latvia, Estonia, Finland, and Norway. Its area is about 3960 thousand km^2, or approximately 40% of the entire territory of Europe.

Tectonically, this area covers the East European, Timan-Pechora, and the Scythian platforms and Fore-Caucasian and Fore-Uralian depressions, Caucasus and Ural folded areas (Fig. 1).

Most of the area is occupied by the East European (Russian) Plain that in the east adjoins the Ural Mountains and from the

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