



The unanswered question of the origin of the Antarctic oases

I.N. Sokratova

Arctic and Antarctic Research Institute, 38 Bering str., St.Petersburg, 199397, Russian Federation (sokratova@aari.nw.ru, +7 812 3522688)

The Antarctic oases are named by the analogy with the oases in hot deserts because of their abrupt difference from the environment of the surrounding polar deserts. First attempts to give a scientific explanation to their existence and origin were made immediately after their discovering in the beginning of XXth century. The existence of ice-free areas was interpreted as the result of “retrocession of ice mantle” by the Scott’s expedition. “Geothermal” theories were widely accepted in 1930th-1940th. The emergence of the ice-free areas was explained by volcanic activity, by radioactive activity and even by heat of the underground coal fires. Some of them could be supported by the data of I.A. Zotikov obtained in 60th on enhanced geothermal heat flux in oases. Swedish scientist Ahlmann (1944) expressed the opinion that the oases of the Neue Schwabia are due to the decline of the ice sheet because of the decrease in the atmospheric precipitation and the increase in the wind erosion. The American geologist Apfel (1948) suggested that the territory of the Banger oasis had been previously covered by ice and freed because of divergence of the ice flow from the cite, low air humidity, thin snow cover depth and active soil warming in summer. This was supported by Avsyuk et al. (1956) who named it the “orographic” hypothesis and further developed it emphasizing the climatic components responsible for maintaining the conditions in the oases. Later on, evidences of successive steps in ice cover disappearance at the oases’ territories were found and explained by the climate change. The combination of orography and climate were later used as the explanation of the oases appearance in Antarctica. The recent paleo-geographical studies are not so focused on understanding of the origin of the Antarctic oases as on the reporting of the

paleo-climate evolution at these territories and the sea-level change. Deglaciation of the oases started 10-12 ky ago according to some investigators. However, some relate this to liberation from the continental ice sheet (Ingolfsson et al.) while others (Bol'shiyanov) state that the oases were never covered by the ice sheet and ice extent evolution was related to the local glaciers variability. Therefore, the question on the reasons and timing of appearance of the Antarctic oases is still unanswered. New empirical data can probably provide new theories on the oases appearance and existence, if this would be part of the planned investigations in Antarctic oases.