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Unusual geomagnetic field behavior at Precambrian-Phanerozoic boundary?

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Detailed paleomagnetic investigations show that numerous Lower Cambrian sections of the Siberian platform contain two far different ancient magnetization components (directions). One of these components (further denoted as “Khramov’s” one) yields the paleomagnetic pole which is located at the base of the Siberian Phanerozoic (beginning from Middle Cambrian) APWP to the south of Australia, another one (further denoted as “Kirschvink’s” component) corresponds to pole disposed in the western part of the Indian Ocean. Available data indicate that both the components exist in reality and are not the artifacts of treatment. The simplest explanation of coexistence of these directions in Lower Cambrian of the Siberia is to suppose that whereas the “Kirschvink’s” component is primary one, “Khramov’s” component is metachronous and has been formed as the result of Middle-Late Cambrian remagnetization. The primary origin of the “Kirschvink’s” component implies very fast Early Cambrian motion of paleomagnetic pole and supports IITPW hypothesis (Kirschvink et al., 1997). Although there are some serious arguments against all-Siberian Middle-Late Cambrian remagnetization, relative proximity of “Khramov’s” and Middle Cambrian poles makes this suggestion still probable. From this point of view it would be interesting to compare the Ediacarian paleomagnetic pole of the Siberian platform with Kirschvink’s, Khramov’s and Middle Cambrian ones. In the case if the former would be located in relative proximity of Kirschvink’s pole it would support IITPW hypothesis, otherwise it would create additional complications for it. We have studied red and green siltstones of Ediacarian Redkoles formation, exposed in outcrops along Angara river and its tributary Irkineeva river (East Enisey Ridge, southwestern Siberian platform). High temperature component, isolated in these rocks, successfully passes fold, reverse and consistency tests, that indicates its primary or near primary origin. Obtained pole has the coordinates: Plat = -60.8°, Plong = 68.1°E, A95 = 5.1°. Thus,

if one accepts that Kirschvink's component reflects the Early Cambrian geomagnetic field direction indeed and Khramov's component is metachronous one, we should admit that beside Early Cambrian big leap between Kirschvink's and Middle Cambrian positions, paleomagnetic pole had also to take 45° jump from its Redkoles (Ediacarian) location to Kirschvink's (Early Cambrian) one. This looks hardly probable and prompts us to look for another explication. We speculate that possible explication could be unusual geomagnetic field behavior around the Precambrian-Phanerozoic boundary.