

Reconstruction and breakup of the Rodinia Supercontinent: Constraint from chronology in north Queensland, NE Australia

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Chronological studies by Rb-Sr, K-Ar and CHIME methods reveal that the Halls Reward metamorphic rocks assigned to be Proterozoic, had been produced at ca. 500Ma.

Dating study for detrital zircon grains by CHIME method tell us that grains had been transported from the Grenvillian orogenic belt and very rarely 3700Ma Archean crust.

Tasman Tectonic Line is a eastern margin of the Australia Craton, In north Queensland, Halls Reward metamorphics have been assigned to be Proterozoic rocks and deformed in Early Paleozoic. Cambrian Balcooma arc-volcanics, which is located to the western side of the Halls Reward metamorphics, are of exceptional occurrence as rocks within Australian Craton. The area of Halls Reward metamorphics, therefore, was a unique "cratonic" block

Our Rb-Sr chronological study for the highest grade metamorphic rocks for the Halls Reward metamorphic rocks reveal that the rocks have been metamorphosed at ca. 500Ma. K-Ar dating for mica in the rocks by Kuramoto, Saito(Yamagata University) and other also indicates the same age. CHIME study by K. Yokoyama(National Science Museum) also gives the consistent crystallization age of monazite.

These results clearly indicate that the Halls Rewards metamorphic rocks are deeper crustal rocks situated beneath the Balcooma arc-volcanic belt.

The CHIME data also tell us detrital zircon ages ranging from 3700Ma till 600Ma with a concentration of the Grenvillian age(1000Ma). Above all, 3700Ma zircon grains give an important information for reconstruction of Rodinia. They may have been transported from north America, western Australia, and north China blocks or other blocks with no-report of such old age. The result tell us the significance of CHIME study.