

## **The Silurian of a Western Part of the Altai-Sayan Folded Area: A Recognition of Standard Boundaries and Geological Events**

E. A. Yolkin<sup>1</sup>

New paleogeographic reconstruction have been recently made for the Ordovician-Devonian of a western part of the Altai-Sayan folded area (YOLKIN et al., 1994, in press). The Altai-Salair basin was shown to belong that time to marginal seas of the Siberian continent. This basin was developed on the Late Precambrian and Cambrian accretionary-collisional complexes of the eastern part of the Altai-Sayan area or on baikalids and early caledonids (salairids). Exposed Silurian is represented here mainly by shallow water deposits of outer and inner shelf environments. Such general geodynamic situation on the discussed area compells to analyze Silurian Altai-Salair sections from new positions.

Silurian succession of the Altai-Salair basin is complete and is represented by marine terrigenous and carbonate deposits. They contain the cosmopolitic diverse pelagic and neritic fauna. Dark and green shales are common here for the Llandovery; limestone are characteristic for the Wenlock and Ludlow, and red colour clastics with a limestone member inside are provisionally named as Pridoli. All these rocks constitute four clear limited sedimentary T-R cycles. Turns from regressions to transgressions are located at the bases of the Silurian, *sedgwicki* Zone (inside Aeronian), Wenlock and Pridoli Series. The second-order cycles have not been recognized. Deepening events are sharply expressed at the bases of the Silurian, *sedgwicki* Zone and Wenlock Series. They are located within a carbonate platform (or outer shelf zone). Intraformational conglomerates start a normal transgressive succession of the Siberian Pridoli. Outlined sections' characters permit to study sea-level fluctuations and to create a sea-level curve from a sedimentological process point of view. In this case the cross-section in Altai for the Wenlock interval through two shelf zones permits to see that the deepening and transgressive events could be aligned in time.

The standard series are treated here in regional schemes as stages. However, there is no alternative for the SSS scale as an international chronostratigraphical language. The main task now is to define a stratigraphical position of the boundary stratotype levels in local schemes.

In this aspect it could be said the following: The base of the Silurian boundary is defined in Altai sections within graptolite black shales just above their sharp contact with Upper Ordovician reef limestones. This boundary is documented by ranges of *G. persculptus* and *A. acuminatus*. Next two series (Wenlock and Ludlov) boundaries are supported only by shelly fauna and by deepening events as well. The base of the Pridoli Series is accepted provisionally as a start of the latest Silurian transgression. The main evidence was a benthic association recovered from normal marine bedded black limestones that are located within a red colour non-fossiliferous clastic sequence.

<sup>1</sup> Institute of Geology, Russian Academy of Sciences, Siberian Branch, 630090, Novosibirsk-90, Russia

This association (trilobites, brachiopods) certainly belongs to the Pridoli fauna. A clear angular unconformity is fixed at the Silurian/Devonian boundary.

Utility of Standard Stage scale for the Altai-Salair Silurian is still questionable. Here it is possible to recognize by graptolites both chronostratigraphical boundaries within Llandovery Series. However they are located within lithostratigraphic units and can't be traced without findings of these fossils. The Wenlock Series is subdivided into two units together by lithology and by shelly fauna. Possibly they are aligned to the Sheinwoodian and Homerian. The Siberian Ludlow is characterized by a single benthic faunal association. Noteworthy the members of this association are widely distributed including British Islands. The lithology of this Series is homogenous - black bedded limestones, with weakly expressed trend to upwards shallowing.

So, the more important features of the Altai-Salair Silurian are: a complete succession, well expressed sedimentary cyclicity for reconstruction of sea-level curve and a presence of reach worldwide distributed graptolites (for Llandovery) and shelly fauna (for Wenlock-Pridoli).

YOLKIN E.A., SENNIKOV N.V., BUSLOV M.M., YAZIKOV A.YU., GRATSIANOVA R.T., BAKHAREV N.K. Paleogeographic reconstructions of a western part of the Altai-Sayan area through Ordovician, Silurian and Devonian and their geodynamic interpretations. *Geologia and Geofizika*, 1994, N 7-8, in press (Russian Geology and Geophysics, 1994, vol. 35, N 7-8; Allerton Press, Inc./ New York).