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DISCUSSIONS

Some Problems of the Paleozoic Tectonic Reconstructions in Central Asia

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Abstract—In the 1990s, several reconstructions showing the position of tectonic elements of Central Asia in different Paleozoic epochs were put forward. At the beginning of the decade, Zonenshain *et al.* [16] completed their long-lasted work on paleotectonic reconstructions. These reconstructions were used as the basis for palinspastic maps of North Eurasia under the editorship of Kaz'min and Natapov [21]. In 1993–1994, three groups of researches from Moscow [12, 19], Istanbul [32, 44], and Novosibirsk [4, 34] published a set of Paleozoic tectonic reconstructions of Central Asia, which are referred to as tectonic models of particular researchers (Zonenshain, Kaz'min and Natapov) or research groups (Moscow, Istanbul, and Novosibirsk). Subsequently, the initial models were elaborated in detail [3, 18, 26, 27, 30, 43, 45]. All the models demonstrate that the terminal Paleozoic collision of plates, microplates, and island arcs resulted in formation of the composite megaplate of Eurasia. At the same time, different authors had different views of the Paleozoic tectonic history of Central Asia, which are used in their reconstructions. The area of Central Asia is also a part of global paleotectonic reconstructions showing only major continental masses. The best known are the reconstructions by Scotese and McKerrow [40] based on paleomagnetic data. They were employed in the majority of the models under discussion to determine positions of Europe (Baltia), Siberia, and other large-size continents. This study is devoted to some problems of crucial importance to conceptions of tectonic evolution of Central Asia. One of the problems is to determine positions of island arcs and microcontinents in different Paleozoic epochs before their amalgamation with Eurasia. Its solution is reflected in the design of reconstructions suggested by different authors. Another problem concerns the origin of ancient sialic basement of Paleozoic island arcs and microcontinents is closely interrelated with the problem of the Early Cambrian paleotectonic reconstructions.

DESIGN OF RECONSTRUCTIONS

Paleozoic fold systems in Asia are traditionally subdivided into linear and mosaic [14, 22, etc.]. Among the latter are Kazakhstan, West Siberia, and Mongolia, which are characterized by relatively short and differently trended fold zones intricately related to one another. Mosaic tectonic patterns are very characteristic of Paleozoides in Central Asia, and make them distinct from other fold regions of the Earth.

When adapting plate tectonics to the fold systems of Central Asia, the majority of researchers use the idea of their primary mosaic structure. Accordingly, they recognize series of minor oceanic basins, microcontinents, and island arcs. Subduction zones reversing their polarity relative to island arcs are common attributes of paleotectonic maps and geodynamic profiles suggested for different areas in Central Asia [1, 2, 16, 19, 33, etc.].

"Multiplication" of oceanic basins reflects the frequent occurrence of fragments of ancient oceanic crust (ophiolites) in the region. In the fold system, ophiolites either mark the oceanic suture (the trace of an extinct ocean), or they can represent allochthonous bodies incorporated into the fold zone as a result of the following: (1) by obduction of crustal fragments from an oceanic or back-arc basin onto a continental margin; (2) by displacement along strike-slip faults cross-cutting the oceanic and continental crust, and (3) by incorporation into an accretionary prism above the past subduction zone. The accretionary prism may include several ophiolite zones different in age, which cannot be taken, however, for indications of closed oceanic basins. The design of a reconstruction depends heavily on our interpretation of ophiolites. When the latter are considered as crustal remnants of particular oceanic structures, the resultant models show the primarily mosaic distribution of island arcs, microcontinents, and oceanic basins. Accepting the second and third of aforementioned viewpoints on ophiolites, we can easily end with a model of primarily linear design.

In words of one syllable, the problem of choosing a reconstruction design can be formulated in the following manner: whether the present-day tectonic elements of Central Asia represented numerous isolated island arcs of the Early Paleozoic ocean (models of Moscow group, Zonenshain, Kaz'min and Natapov), or they were aligned in a single island-arc system (the Istanbul model). Distinctions in designs are most pronounced in reconstructions for the Early Paleozoic and Silurian times.

The mosaic design is characteristic of models of the Moscow group, Zonenshain, Kaz'min and Natapov.

These reconstructions have no analogues in the present-day oceans. Consequently, the tectonic evolution of the region seems exceptional, unlike those of other fold systems of the Earth.

The Istanbul model is of an alternative character. The model suggests that the mosaic structural patterns of Central Asia is secondary and originated in response to strike-slip displacements of fragments of the originally linear island-arc system during the Middle and Late Paleozoic. Such a system has been reconstructed as the Early Paleozoic Kipchak island arc located between the Baltic and Siberian cratons and conjoined with the Tuva-Mongolian arc. It should be noted that the model by Zonenshain shows an intention to amalgamate arc fragments into the extensive island-arc systems, for instance, his reconstruction for the Early Cambrian [16] includes the Chengiz–Tuva island arc over 4000 km long.

To assess the available models, it is natural to call attention to sedimentary formations and magmatic rocks. Unfortunately, this approach is not unambiguous. We know nothing about sediments accumulating exclusively at the termination of an island arc, as we cannot distinguish the natural fossil termination of an island arc from its end truncated by a strike-slip fault. Arguments in support of the natural termination of an island arc, can probably be inferred from data on directions of the material transport from the island arc, but I do not know if such data have ever been obtained. The study of young island arcs and marginal magmatic belts shows that magmatism varies in age and composition along the arc and that magmatic and amagmatic segments can alternate in that direction. Consequently, there are no unambiguous criteria for resolving the dilemma.

The paleomagnetic method allows identification of original paleolatitudes of the studied objects and their position with respect to the paleomeridian. These data are important being independent of tectonic reconstructions. The position of continents, microcontinents, and island arcs in paleotectonic reconstructions should be consistent with the results of paleomagnetic studies. The position of major continents in all paleotectonic reconstructions has been determined on the basis of paleomagnetic data. This approach is inapplicable for island-arc complexes because, due to the lack of necessary data, positioning of island arcs depends to a great extent on the chosen reconstruction design.

Comprehensive paleomagnetic studies of Paleozoic ophiolites were carried out in Central Asia [23]. Their data identify paleolatitudes of past basins with oceanic crust and orientation of sea-floor spreading zones. They cannot be however used to verify and correct the position of sialic blocks and islands arcs in the reconstructions. The high-quality paleomagnetic data on Devonian rocks from such blocks were obtained recently [6, 7, 10, 11, 36, 39], when the reconstructions under consideration were already worked out using only limited paleomagnetic information on the Tarim.

DEVONIAN PALEOMAGNETISM AND PALEOTECTONIC RECONSTRUCTIONS

Analysis of rock magnetization leads to the following conclusions regarding the position of the studied objects in the Middle–Late Devonian [6, 7, 11];

(1) Turkestan margin of the Alai–Tarim microcontinent (one facing the Turkestan ocean) was trending north–south;

(2) the Baubashata marginal region (Fig. 1, A) of the Alai–Tarim microcontinent was at the latitude $8° \pm 0.8°$;

(3) the facies zones in the Turkestanian margin of the Kazakhstan–Kirgiz sialic block were trending north–northeast;

(4) the Chatkal marginal region (Fig. 1, B) of the Kazakhstan–Kirgiz block was at the latitude $23° \pm 1.4°$;

(5) The distance between Baubashata and Chatkal regions was $15° \pm 1.1°$ along the paleomeridian (1700 ± 120 km);

(6) the Chengiz–Tarbagatai margin (the northern one in the Devonian geographical coordinates) of the Kazakhstan–Kirgiz sialic block (Fig. 1, C) was trending close the east–west direction;

(7) this margin was at the latitude $21.3° \pm 3.6°$;

(8) the Rudnyi Altai active margin of the Altai sialic block (Fig. 1, D) was trending northeast;

(9) the middle part of the margin was at the latitude $31.7° \pm 4.1°$;

(10) the distance between Chengiz–Tarbagatai and Rudnyi Altai zones was $10.4° \pm 4.4°$ (1150 ± 500 km);

(11) the Saur island arc (Fig. 1, E) was at the latitude $31.8° \pm 6.8°$.

Let us compare these conclusions with positions of the Devonian structures in paleotectonic reconstructions of Central Asia (Table 1), which are presented in four models only as the Devonian period has not been analyzed by the Novosibirsk group. All four models are more or less at variance with paleomagnetic data on Devonian rocks. The Moscow and Istanbul models are less inconsistent with these data, while schemes by Zonenshain, Kaz'min and Natapov appear to be ambiguous.

The analysis also shows that reconstructions can be corrected to fit the results of paleomagnetic determinations, though without principal modifications in the design. Only additional high-quality paleomagnetic determinations for various stratigraphic levels can help to solve the problem under consideration.

GENESIS OF ANCIENT SIALIC BASEMENT OF PALEOZOIC ISLAND ARCS AND MICROCONTINENTS

All microcontinents and most of Paleozoic island arcs of Central Asia had the ancient sialic basement. The essence of paleotectonic reconstructions depends

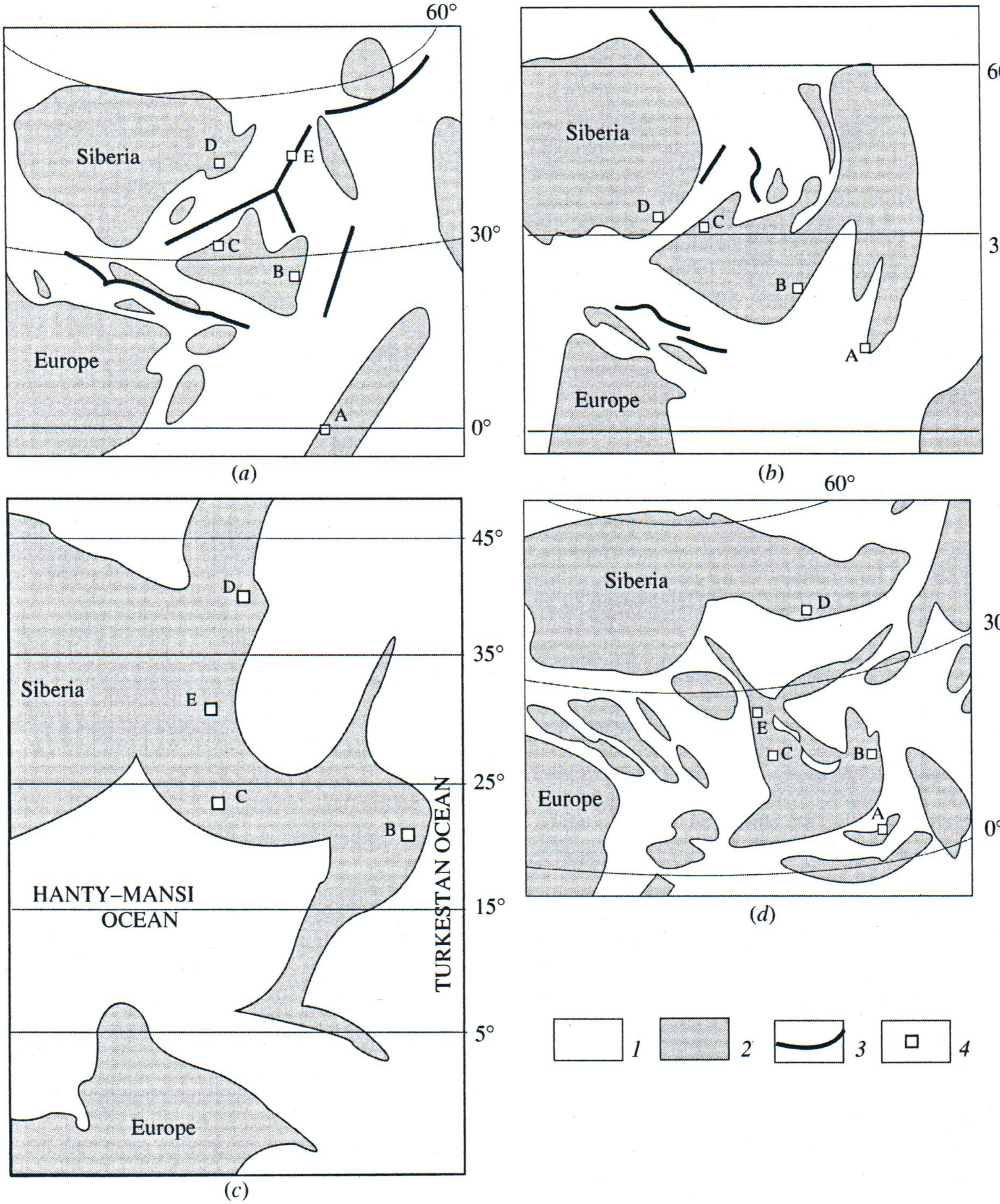

Fig. 1. Position of the objects of paleomagnetic studies (A–E) in Devonian palinspastic reconstructions: (*a*) by Zonenshain, Late Devonian [16]; (*b*) by Moscow group, Early–Middle Devonian [19]; (*c*) by Istanbul group, Late Devonian [44]; (*d*) by Kaz'min and Natapov, Middle–Late Devonian [21]. Original symbols are unified and indicate: (*1*) oceanic crust, (*2*) continental crust, (*3*) ensimatic volcanic arcs, (*4*) site of paleomagnetic study (A–E)

to a large extent on the solution to the problem of the basement origin. Different models suggest different solutions.

According to the Istanbul model, the rocks of the Pricambrian basement of all structural elements presently located to the north of the Tarim and Chinese platforms were constituents of the European–Siberian continent in the late Pricambrian while the basements of the Tarim and Chinese platforms were of the Indian–Australian origin.

Table 1. Results of testing Devonian paleotectonic reconstructions for consistency with paleomagnetic data

Element of reconstruction	Models			
	Zonenshain	Moscow	Istanbul	Kaz'min and Natapov
Strike of the Turkestan margin of the Alai–Tarim microcontinent	(–)	+	O	(–)
Paleolatitude of the Baubashata region (Fig. 1, A) of the Turkestan margin of the Alai–Tarim microcontinent	(–)	+	O	+
Strikes of facies zones at the Turkestan margin of the Kazakhstan–Kirgiz block	+	+	+	(–)
Paleolatitude of the Chatkal region (Fig. 1, B) of the Kazakhstan–Kirgiz block	+	+	+	+
Distance between the Chatkal and Baubashata regions along the paleomeridian	(–)	+	O	+
Strike of the Chengiz–Tarbagatai margin of the Kazakhstan–Kirgiz block	(–)	(–)	+	(–)
Paleolatitude of the Chengiz–Tarbagatai zone (Fig. 1, C)	(–)	(–)	+	+
Strike of the Rudnyi Altai margin of the Altai block	+	+	(–)	(–)
Paleolatitude of the Rudnyi Altai region (Fig. 1, D)	(–)	+	(–)	(–)
Distance between the Rudnyi Altai and Chengiz–Tarbagatai regions along the paleomeridian	+	(–)	(–)	(–)
Paleolatitude of the Saur island arc (Fig. 1, E)	(–)	O	+	(–)

Note: Symbols: (+) position of the object in the paleoreconstruction consistent with paleomagnetic data; (–) position of the object inconsistent with paleomagnetic data; (O) the object is beyond the reconstructed area or omitted.

The Moscow model suggests an alternative solution, according to which the Pricambrian basement of nearly all Paleozoic microcontinents and island arcs of Central Asia is of the Australian origin (except for the Baratai and Batenevskii blocks, where data on the basement genesis are unknown).

The solution of the Novosibirsk group is intermediate between these two. The group suggested that the ancient basement of all tectonic elements presently located to the north of the Tarim and Chinese platforms is of the European–Siberian origin, except for the Altai block (the Russian and Mongolian parts of the Altai Range), the basement of which is of the Indian–Australian origin. It is also conjectured that this block was wedged between the blocks of another genesis.

According to Zonenshain's model, the Tarim, Karakum, and Pamirs blocks are admitted be of the Indian–Australian origin; the Tom' and Barguzin blocks are of the Siberian origin, while the basement genesis of other blocks is not specified. Kaz'min and Natapov' did not extend their analysis to the Early Paleozoic and Pricambrian.

Arguments in favor of a particular solution can be based on biogeographical, paleomagnetic, and geochemical data. The last two methods have not been applied yet, but data of this kind can be obtained in the future. The geochemical method is based primarily on regional geochemical characteristics of the continental crust, which remain unchanged in the course of tectonic, magmatic, and metamorphic reworking [9]. In principle, this can help to determine from what continent and even of what part of the continent the basement of an island arc or a microcontinent was derived in the past.

Lithology of ancient sedimentary sequences, in its direct or formational interpretation, is often employed in modeling conditions of sedimentation. By correlation of sections or formations, the elongated marginal belts of a continent are depicted [29, 30, etc.]. In this case, it is often assumed that such an interpretation is a weighty argument in favor of one or another viewpoint on the genesis of ancient sequences. Meanwhile, neither sedimentary facies nor formations bear any information about which or near which continent they accumulated. Such a conclusion is nothing but a result of interpretation (frequently, multiple interpretation) of geological data. There may be different interpretations and different attitudes to them. For instance, the upper Pricambrian sections in the northern Tien Shan, Kazakhstan, Mongolia, and the Urals contain characteristic diamictite beds. According to the Moscow model, diamictites of the Urals accumulated on the European platform, while all others represent deposits of the Australian platform. The Istanbul group divides diamictites into approximately equal parts attributable to the Europe–Siberian and Australian deposits.

The biogeographical method operates with the data that are independent of tectonic interpretations, but it is applicable only to the Early Cambrian and more recent epochs. In the Lower Cambrian, as it follows from the majority of the models, the microcontinents and island arcs were usually shaped, but not yet detached from the parental continent or displaced away from it to a short distance. The Moscow model is the only one that presumes a considerable drift of microcontinents in the Vendian. Below we will look at the biogeographical data for the Early Cambrian.

Biogeography of the Early Cambrian and Paleotectonic Reconstructions

Biogeographical reconstructions for the Early Cambrian are mostly of the global character. In their recent work [13], Zhuravlev and Maidanskaya presented the results of statistic analysis of the fossil faunas. The analysis was aimed to determine the degree of faunal similarity in major continents during the Late Vendian and Early Cambrian. The conclusions obtained concern the proximity or remoteness of the continents from one another in terms of past longitudinal positions, as well as the changes in their relative position in the Early Cambrian. The analyzed data file included all species: attached, creeping, and floating. The similarity indices obtained turned out to be variable with time in a fluctuating (recurrent) mode. This type of variations of the similarity indices rather depends upon the changing directions of sea currents than upon the back-and-forth migration of continental masses. In addition, the climatic zoning of faunas has not been taken into consideration. The difference between faunas from Siberia and Baltia, which were located at that time in different climatic zones, can naturally be a response to climatic factors and does not imply that Siberia was remote from Baltia.

For our purposes, biogeographical studies, in which data on Siberia and Central Asia have been taken into account to the greatest degree, are of the prime interest. Studies on trilobites by Repina [24, 25] and recently published results on biogeography of regular archaeocyathids and brachiopods [20, 28], are exactly of this kind.

Archaeocyathids. Regular archaeocyathids appeared in the Siberian platform at the beginning of the Tommotian. By the end of that time, there were twelve aboriginal genera and twice as many in the early Atdabanian, when interchange between genera of Siberia and Altai–Sayan region began. In Kazakhstan and Middle Asia, the history of archaeocyathids started in the middle Atdabanian with the advent of two Siberian lower Tommotian genera. In the late Tommotian, there were already three Siberian genera and nine in the early Botomian. In the late Atdabanian, the Siberian archaeocyathids reached Australia (6 genera). In the early Botomian, there were already 12 Siberian genera [20].

The Siberian archaeocyathids reached Australia approximately 10 m.y. after their origin. The organisms migrated in a form of larvae together with other plankton [31]. These organisms migrated from one radiation center and cannot help us to find the answer to the tectonic problem under consideration.

Brachiopods. The same is true for the brachiopods. The majority of their classes appeared in Siberia in the Toyonian and Atdabanian. They reached Australia 10–15 m.y. later (Table 2). Brachiopod larvae float in the pelagic zone for a long time (lingulids do it for about a month) and can be carried by currents far away.

Triolobites. Long before the appearance of plate-tectonic reconstructions, the Lower Cambrian biographical provinces inhabited by contrast trilobite faunas had been known [37, etc.]. This fact attracts attention to trilobites as to a group suitable for verification of paleotectonic reconstructions and for solving the problem of the genesis of the ancient basement of island arcs and microcontinents. Let us examine the paleotectonic models in the light of data on biogeography of the Early Cambrian trilobites.

Trilobites are seldom in the Tommotian sediments. In the Atdabanian, two biogeographical units could be neatly delineated: the Indo–Australian and Pacific–Atlantic regions.

The Indo–Australian biogeographical region persisted unfailingly till the end of the Early Cambrian. The region was a habitat of the trilobite family Redlichiidae, whose species are known from the lower Cambrian rocks of Australia, India, Iran, as well as of the Tarim, Chinese, and Korean platforms [24, 35].

The Pacific–Atlantic biogeographical region encompassed the area of present-day Asia to the north of the Tarim and Chinese platforms (North Asia), as well as Europe, North Africa, and North America. Within the region, several biogeographical provinces are distinguished, and interrelations between them changed from one age to another. For our purposes, North Asia is of interest. This area was populated by trilobites of the suborder Olenellina in the Atdabanian and by the family Protolenidae in the Botomian and Toyonian [24]. The individual Altai–Sayan province that appeared in the region was spread over the Urals, Kazakhstan, and Mongolia–Okhotsk sector, and all areas had many trilobite spice in common, similar to those of the Siberian platform [25].

Data on trilobites from the Talas–Karatau zone of the northern Tien Shan [17] evidence that this region and Siberian platform represented communicating basins in the Tommotian and Atdabanian, while they were almost isolated from each other in the Botomian and Toyonian. Moreover, the Toyonian rocks bear abundant *Redlichia chinensis* Walcott, the species characteristic of rock sequences in China, Korea, India, and Australia. This fact shows that the northern Tien Shan basin was communicating with the Indian–Australian biogeographical province in the Toyonian.

The distinctions between the Indian–Australian and Pacific–Atlantic biogeographical regions are usually considered as indications of isolating role of the Cambrian ocean, which inhibited migration of the benthic fauna. The ocean is known under names Tethys or Proto-Tethys [24, 25, 38, 41], both inappropriate for the Cambrian basin, since they cause associations with other epochs and structures. The basin could be probably called Paleo-Tethys (Paleozoic Tethys). This term, however, has already been applied to various oceanic structures, commonly to the Paleozoic ocean that left the suture within the Alpine foldbelt [2, 42, etc.]. This still makes sense, because the Alpine foldbelt is successor of the Tethys. Sometimes the oceanic basin under discussion is mistaken for the Paleoasian ocean [24, 25] that is incorrect, because the latter is described [15] as a basin, which separated continental blocks of Siberia and Kazakhstan (Kokchetav–Muyunkum). Both blocks are element of the Pacific–Atlantic biogeographical region.

The present-day demarcation line between the Lower Cambrian Indian–Australian and Pacific–Atlantic biogeographical regions runs along the northern margin of the Tarim and Chinese platforms. The northern margin of the Tarim (the Paleozoic Alai–Tarim continent) represents the suture left by the Turkestan ocean [5, 8]. The eastern extension of the suture lies to the north of the Chinese platform [43].

In accordance with the Istanbul model, the Turkestan ocean of the Early Paleozoic time separated sialic blocks of the Euro-Siberian and Indo–Australian origin thus fitting to the general arrangement of the Early

Table 2. Migration of Lower Cambrian regular archaeocyathids and brachiopods, according to [20, 28]

Fossils	Appearance in the region			
	Siberia	Altai, Sayan	Kazakhstan, Tien Shan	Australia
Archaeocyathids	Tom$_1$	Atd$_1$	Atd$_2$	Atd$_3$
Brachiopods (orders):				
Paterinida	Tom$_1$	Atd$_1$	Bot$_3$	Bot$_3$
Obolellida	Tom$_2$	Atd$_3$	Bot$_1$	Bot$_3$
Orthida	Atd$_3$	Atd$_4$	Bot$_3$	Toy
Lingulida	Atd$_3$	?	Atd$_3$	Bot
Acrotretida	Atd$_4$	?	Bot$_1$	Bot$_3$

Note: Stages: (Tom) Tommotian; (Atd) Atdabanian; (Bot) Botomian; (Toy) Toyonian.

Cambrian biogeographical provinces. The considerable distinctions between trilobite faunas of the northern Tien Shan and Siberia at the Botomian time [17], can be explained by the opening of the Khanty–Mansi backarc basin, as is suggested by the Istanbul group. The occurrence of the Indian–Australian trilobites in the Toyonian sequences of the northern Tien Shan may be a consequence of contraction experienced by the Turkestanian ocean by that time.

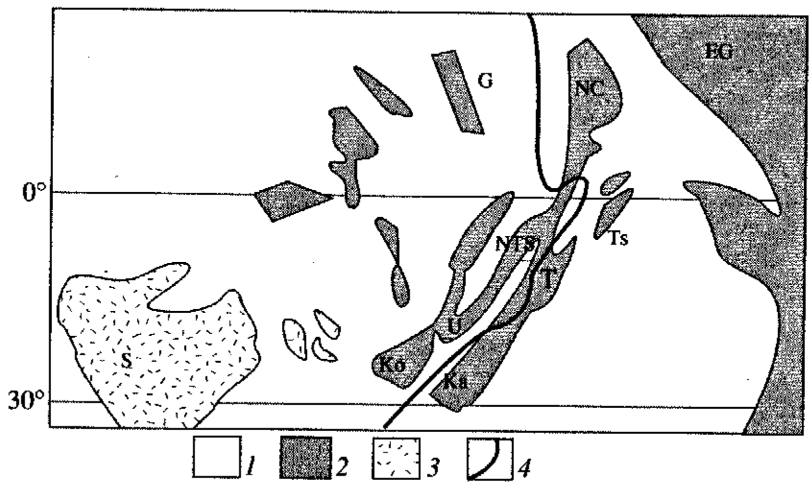

Fig. 2. Position of the demarcation line between the Early Cambrian Indian–Australian and Pacific–Atlantic biogeographical regions [24, 25] in the paleogeodynamic reconstruction of the Moscow group for the latest Vendian and the first half of the Early Cambrian [19]: (*1*) oceanic crust; (*2*) continental crust of the Indian–Australian ("Gondwanan") origin; (*3*) continental crust of the Siberian and unknown origin; (*4*) demarcation line between Indian–Australian and Pacific–Atlantic biogeographical regions of the Lower Cambrian; (S) Siberia; (Ko) Kokchetau; (Ka) Karakum; (U) Ulutau; (T) Tarim; (NTS) North Tien Shan; (Ts) Tsaidam; (G) South Gobi; (NC) North China; (EG) "East Gondwana" (India–Australia).

The common Lower Cambrian trilobites from the Altai, Sayan, Kazakhstan, and Urals and their affiliation with the Siberian fauna are inconsistent with the Indian–Australian origin of the Altai block, as is suggested in the Novosibirsk model. Other components of the model do not contradict the biogeographical zoning of the Early Cambrian, and the whole model can be corrected according to this zoning.

In the model by Zonenshain, the Early Cambrian position of the North Korean continental block is incompatible with biogeographical data. This model can also be corrected by moving the block nearer to the Indian–Australian continent.

The Moscow model is much more inconsistent with the biogeographical zoning. For the Early Cambrian time, it suggests that the demarcation line between the Indian–Australian and Pacific–Atlantic biogeographical regions crosses the land and seas (Fig. 2). It is unlikely that such a line could correspond to the persistent ecological barrier for the neuritic fauna during millions of years. Other aspects of the Moscow model, such as the Indian–Australian origin of almost all sialic blocks of Central Asia and their Vendian drift from Australia to Siberia, do not agree with the Lower Cambrian biogeographical zoning either. The biogeographical data, require radical changes in this model.

CONCLUSIONS

In the 1990s, several models of tectonic evolution of Central Asia during the Paleozoic and corresponding paleotectonic reconstructions were published by Zonenshain [16], the Moscow [19, etc.], Istanbul [44, etc.], and Novosibirsk [34, etc.] research groups, and by Kaz'min and Natapov [21]. Discussed above were the problems concerning the design of reconstructions and the origin of ancient basement in tectonic elements of Central Asia. These problems are solved in different ways by different models.

1. **The Design of Paleotectonic Reconstructions.** A considered data independent of tectonic ideas (those on paleomagnetism and fauna), and compared them with the paleotectonic reconstructions for two time levels. The high-quality paleomagnetic data obtained recently were used to analyze available models for the Middle–Late Devonian, while the biogeographical zoning of the Early Cambrian trilobites was taken to check paleotectonic schemes for this level. The results of this analysis suggest the following conclusions:

a) The Devonian reconstructions. These are missing in the Novosibirsk model, whereas all other schemes do not agree with the paleomagnetic data in one way or another. The Moscow and Istanbul models are less considerably inconsistent with these data, than models by Zonenshain, Kaz'min and Natapov. In any case, all the Devonian reconstructions should be corrected to fit the paleomagnetic data.

b) The Lower Cambrian reconstructions. The Istanbul model is entirely compatible with the biogeographical zoning of the Early Cambrian trilobites. Some inconsistencies with the biogeographical data, which are characteristic of models by Zonenshain and Novosibirsk group, can be corrected. The model suggest by Kaz'min and Natapov does not consider the Early Paleozoic. The Moscow model is incompatible with the Lower Cambrian biogeography and should be radically changed from this viewpoint.

The improvement of paleotectonic reconstructions for Central Asia would be possible if the high-quality paleomagnetic data on the Lower Paleozoic rocks from island arcs and microcontinents could be obtained.

2. **Genesis of the Basement of Paleozoic ensialic island arcs and microcontinents.** The biogeographical zoning of in the Early Cambrian suggest the Indian–Australian origin of the basement of the Tarim and Chinese microcontinents and the European–Siberian origin of the sialic basement in the present-day tectonic blocks and zones located to the north of the Tarim and North Chinese platforms.

The problem of the ancient basement genesis in Paleozoic microcontinents and ensialic island arcs of Central Asia can be solved on the basis of geochemical parameters characterizing the crust of these structures and major Paleozoic continents, such as Baltia, Siberia, Australia and India.

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