

Answer to the comments by P. Gočev on the Matorides in the East Stara-Planina Mountains

The first proofs for the presence of Jurassic rocks near the town of Kotel have been published at the end of the 19th century by Fr. Toula (and not by Б а к а л о в, 1942, as Gočev claims). All paleontological evidence from that time onwards comes from olistolites which have nothing in common with the stratigraphy of the Jurassic sequence in the Eastern Stara-Planina Mountains. The important contribution by Чернявска (1965) elucidated the age of a part of the Jurassic rocks — the Kotel Formation, and only Чумаченко, Чернявска (1989, 1990) proved undoubtedly Early Jurassic age for the unknown to that time turbiditic rocks — the Sinivir and Balaban Formations.

A number of the criticisms of Gočev are based on misunderstandings, and some others are related to different interpretations of the facts. A number of facts cited by Gočev have been observed and published by us. Thus, the sole of the Kotel Formation is represented by the Balaban Formation not only at the village of Tárnak but also along the valley of the river Elešnica (south of Conevo), in the valley of the river Balabandere, in the locality Zelenič, in the Vratnik Pass, etc. The Balaban Formation is related to the Kotel Formation in a common sedimentation cycle, i. e. they naturally follow one after the other in the normal (for the region) sequence. The affirmation by Gočev that the Kotel Formation is characterized not only by olistostrome but also by packets of argillite-quartzitic flysch with olistostrome and breccias is also not a new finding being already proven by Чумаченко, Чернявска (1989, 1990) and Реубернès et al. (1989).

The interpretations by Gočev on the structure of the Kotel Formation near Kotel are groundless. The "mirror symmetry" is not proven, and the "repetition of the Kotel Formation in the section at the town of Kotel" should be paleontologically proven. Moreover, Gočev himself shows on his fig. 2 a normal succession of Triassic and Jurassic rocks.

The opinion that the Mator Planina anticline is a "nomen nudum" being a younger synonym of the Kotel anticline is also not based on real evidence. When introducing the Kotel anticline, Йорданов (1957, p. 94) described it as follows: "The oldest formations in the core of this structure are the Triassic and the Jurassic at Kotel. West of the locality Zeleničeto the core is built up of Turoonian flysch. The northern limb, beginning from east to the west, is first upright. It is formed by the Senonian limestones of the northern type. . . Between the valleys of the rivers Krivata Reka and Boazdere, in the locality Zeleničeto, the Jurassic and the Cenomanian from the core of the anticlines are thrust to the north over the Senonian". It is clear that the Mator Planina anticline (built up entirely of Jurassic rocks and formed before the Late Cretaceous) is something absolutely different from this structure: according to Йорданов (1957, pp. 104-105) the Kotel anticline was predestined in the Late Cimmerian phase in the end of the Tithonian, and definitely formed during the first Pyrenean phase. Sediments with Tithonian age are not known in this area, and thus the opinion of Jordanov about the early onset of the Kotel anticline is void; the Kotel anticline would be a comparatively young (Pyrenean) structure principally different from the Mator Planina anticline.

The affirmation that "the East Balkan Mountains represent a Young Alpine retrocharrige collisional segment" has not been proven with any field evidence. It is not proven also by the interpretation of the deep seismic sections performed by Gočev (fig. 2): on all sections the Jurassic rocks are following over the Triassic which is covering the Paleozoic, i. e. there is a normal succession interrupted by unconformities. A thrust contact could be proven only in the case if the prolongation of the Luda Kamčija Group would be found over younger rocks south of the East Stara-Planina Mountains.

The citations about the intensely folded Triassic and Jurassic sediments are also incorrect. Triassic rocks have not been proven in a normal position (all outcrops are in olistostromes); the Jurassic rocks of the Luda Kamčija Group form the gently dipping limbs of the Mator Planina anticline, and only locally synsedimentary folds typical of the flysch sediments can be observed, as already mentioned by Йорданов (1957) and Паскалев (1988) but always at the background of the gentle limbs of the anticline. The explanation of the Triassic and Jurassic olistolites in the past as a tectonic phenomenon needed "intensely folded Triassic and Jurassic" but without any evidence. It seems that Gočev is following this explanation when trying to interpret the position of the olistolites east of Kotel as a "mirror symmetry" with "tectonic repetition".

The "new regional thrust line" south of Razboyna and Oseniški Vrah as well as the Glogovec klippe is entirely fictitious structure. Both tectonic structure should be first not only checked for but also proven by Gočev himself!

"The core of the Mator Planina anticline is not exposed on the surface", and it had to be found by the deep boreholes (although their positioning is not the best one). However, if the interpretation by Gočev would be taken for correct, the Triassic core could be considered as proven. His fig. 2 shows an almost unfolded platform built up of a superposition of Paleozoic, Triassic and Jurassic rocks. Thus, the whole "allochthonous character" of the Luda Kamčija Group is far from being inambiguously proven. The rocks of the group, according to Gočev's interpretation of the three deep boreholes (fig. 2) lay either over or beneath the Upper Cretaceous sediments. The section of the borehole P-1

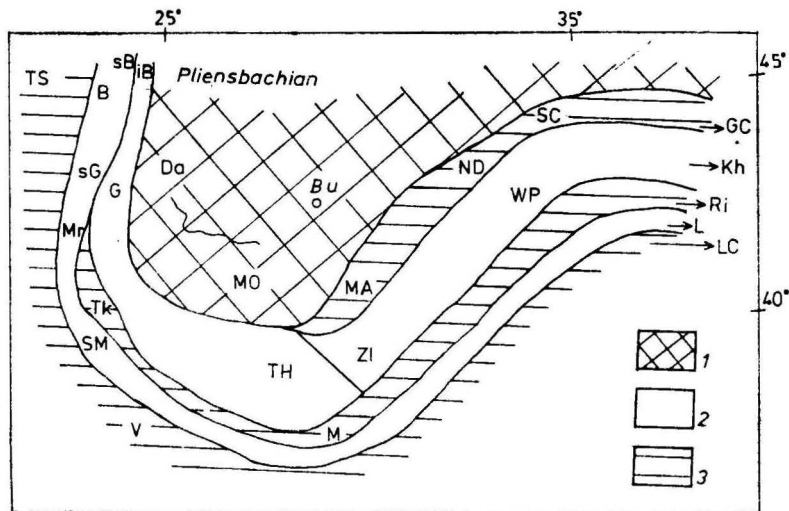


Fig. 1. Geodynamics of Bulgaria and its connections with the neighbouring regions at the end of the Pliensbachian Age

1 — southern board of Eurasia (Moesian platform); 2 — fragments with continental Earth's crust; 3 — sutures with oceanic or thin continental crust.

B — Bucovinian; Da — Danubian; G — Getic; GC — Great Caucasus basin; iB — infra-Bucovinian; Kh — Khrām massif; L — Lock massif; LC — Lesser Caucasus; M — Mandrica; MA — Matoids; MO — Moesia; Mr — Moravic; Nd — North Dobrogea; Ri — Rioni; sB — sub-Bucovinian; SC — South Crimea; sG — sub-Getic; SM — Serbo-Macedonian; TH — Thracian massif; TK — Trekljano; TS — Transylvanian ocean (suture); V — Vardar ocen (suture); WP — Western Pontides; ZI — Zlatarski ridge

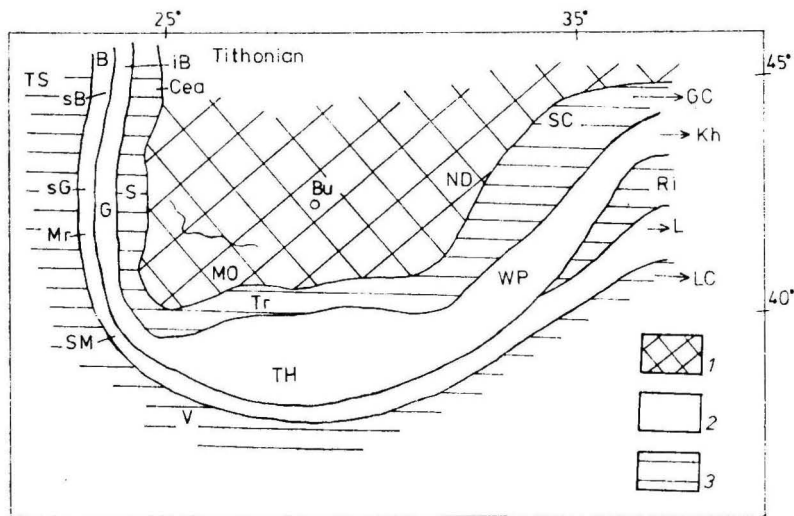


Fig. 2. Geodynamics of Bulgaria and its connections with the neighbouring regions at the end of the Tithonian Age

1 — southern board of Eurasia (Moesian platform); 2 — fragments with continental type of the Earth's crust; 3 — sutures with oceanic or thin continental crust.

B — Bucovinian; Cea — Ceahlau; G — Getic; GC — Great Caucasus basin; iB — infra-Bucovinian; Kh — Khrām massif; L — Lock massif; LC — Lesser Caucasus; MO — Moesia; Mr — Moravic; ND — North Dobrogea; Ri — Rioni; S — Sinaia-Severin; sB — sub-Bucovinian; SC — South Crimea; sG — sub-Getic; SM — Serbo-Macedonian; TH — Thracian massif; Tr — Trojanids; TS — Transylvanian ocean (suture); V — Vardar ocean (suture); WP — Western Pontides

Solnik does not confirm the opinion that "the rocks of the Luda Kamčija Group are directly thrust over Tithonian and Lower Cretaceous complexes". According to the unpublished data kindly supplied by I. Sapunov, the Lower and Middle Jurassic rocks of the Luda Kamčija Group are thrust at a depth of 1210 m over Upper Cretaceous limestones of "northern type" which at a depth of 2007 m cover transversively the BerriAsian rocks of the Tiča Formation. The Mator Planina anticline is obviously also not a "monocline" as pretended by Gočev — no monocline has a crest and northern and southern limbs as proven by Чумаченко, Чернявска (1989). The seismic sections in their interpretations by Gočev are far from proving that the "southern margin of Eurasia" is under-thrusted southwards at minimum 40 km beneath the Luda Kamčija Group along the Čudnite Steni dislocation: the "edge of Eurasia" reaches no farther south than Kotel!

The relations between the "charriage of the Kotel trough", the "Northern Strandzhides" (if such existed in the Jurassic?!) and the Trekljano zone in the Kraiste area are also not proven. My opinion will be exposed elsewhere but I would like to emphasize that there is no similarity between the Jurassic sediments of the Luda Kamčija Group, on the one hand, and the Trekljano Group (in the Kraiste region) and its continuation in the Mandrica area (in the East Rhodope Mountains), on the other. The sediments of the Luda Kamčija Group have been deposited in the same basin (now preserved as a suture) with the sediments of Northern Caucasus, the south Crimea (Eskiordin Formation) and North Dobrogea (Nalbant and Deniztepe flysch), and this basin was a western prolongation of the Paleotethys of some authors (e. g. Şengör et al., 1984) (figs. 1, 2). However, Gočev is right that the basin of the Matorides cannot be a western prolongation of the Jurassic ocean between the Great and Minor Caucasus, and that it has its "natural prolongation into the Early Jurassic flysch trough of Svantetia". My present opinion (figs. 1, 2, 3) coincides with this concept.

I would like to make some remarks to the illustrations (figs. 1, 2 and 3) of Gočev. The caption of fig. 1 is incorrect as far as not only the Kotel Formation but also Sinivir and Balaban Formations are shown on the sections. However, according to my observations the last two formations are present only as olistolites which is inconsistent with the two thrusts (Glogovec Nappe and Glogova Nappe) shown. The thrust contact is under interrogation mark which indicates the doubts of Gočev himself. Another omission is that the formation with index K_2 cm (Cenomanian) has been proven by Peybernès et al. (1989) as Upper Albian — Cenomanian.

It is a pity that the interpretations on fig. 2 are not accompanied by the primary seismic documents. It is not clear why the term "4. Rocks of the Glogova thrust system" has been introduced, and among them a subdivision "T₃-J₁₋₂" is shown on section 89A — 88. Its sense is not clear but I would suggest that Gočev is showing in this manner the existence of the Mator Planina anticline, with the marker level of Balaban Formation underlayed by the turbiditic sediments of the Sinivir Formation, and covered by the olistolite-bearing argillites of the Kotel Formation. No data for the thrust structure marked by the "charriage of the black flysch" could be found on fig. 2: the contact between the Jurassic rocks of the "Glogovec thrust system" with the underlaying "carbonatic

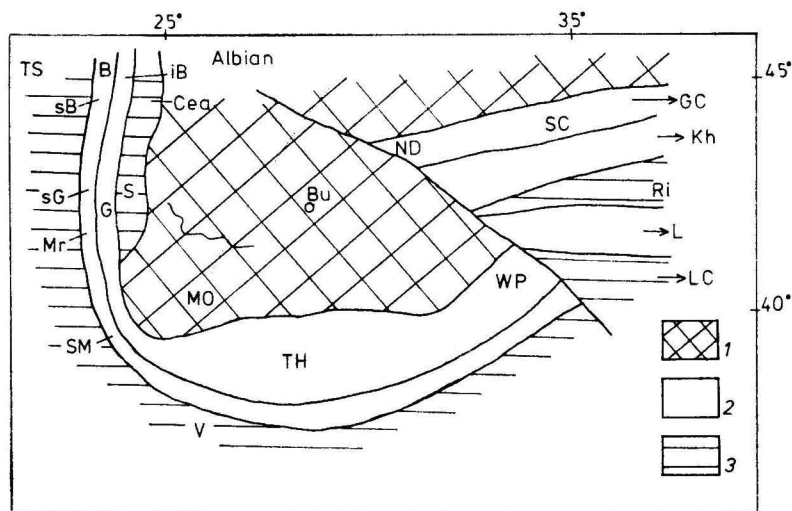


Fig. 3. Geodynamics of Bulgaria and its connections with the neighbouring regions at the end of the Albian Age

1 — southern board of Eurasia (Moesian platform); 2 — fragments with continental crust; 3 — sutures with oceanic or thin continental crust.

B — Bucovinian; Cea — Ceahlau; G — Getic; GC — Great Caucasus basin; iB — infra-Bucovinian; Kh — Khrum massif; L — Lock massif; LC — Lesser Caucasus; MO — Moesia; Mr — Moravia; ND — North Dobrogea; Ri — Rioni; S — Sinaia-Severin; sB — sub-Bucovinian; SC — South Crimea; sG — sub-Getic; SM — Serbo-Macedonian; TH — Thracian massif; TS — Transylvanian ocean (suture); V — Vardar ocean (suture); WP — Western Pontides.

Upper Triassic breccia etc." can be easily explained by a normal Triassic — Jurassic sequence locally additionally complicated.

A number of discrepancies exist between figs 2 and 3. Thus the unit "Glogova thrust system" (fig. 2) is named "Circum-Rhodope — Strandzha zone" on fig. 3. The position of the unit "Balkan Gresten" as well as the position of the "Kiranlar Gresten" within the "Circum-Rhodope — Strandzha zone" are unclear. "Gresten" is a shallow continental-marine development of the Lower Jurassic sediments in the Eastern Alps, and should not be used as names of tectonic units, and least of all, for tectonic units formed "after the Austrian tectogenesis — Palealpides, and in the beginning of the Subhercynian retrocharriage — Mesoalpides". It is hardly possible that one zone may contain in the same time "Black flysch — radiolarites", "Black flysch — Kotel" and "Kiranlar Gresten" — these sediments are formed in different paleogeographic environments, and there are no common features which could back with arguments such a unification.

The sense of the terms "Black Flysch" and "Black Flysch — Kotel" is not clear — what is their place in the mobilistic concepts of Gočev? The differences between "Glogova nappe" (fig. 1b) and "Glogova nappe system" (fig. 2-4) are not clear too.

Finally, I would like to thank Dr. Gočev for his attention to my modest stratigraphic, paleogeographic and paleotectonic ideas developed in the papers discussed.

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