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The sedimentation area of the Mecsek Mts. was not in the West Carpathians

5 text-figs, Slovak summary
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Abstract. In the paleogeographical reconstructions several Hungarian geologists place the Mecsek Mts. during the Mezozoic to the sedimentation area of the West Carpathians, either connect it with the Tatricum or place it to the substratum of the Flysch Belt at the contact of the West and East Carpathians or to the margin proper of the Bohemian massif (European platform) to the neighbourhood of the Silesian unit. With comparison of facial development of the individual stratigraphical levels and tectonic consequences we point to the circumstance that this opinion cannot be maintained. We mention the reasons according to which the sedimentation area of the Mecsek Mts. at least in the Lower Jurassic, should be supposed at the end of the South Carpathians.

Introduction

The Mecsek and Villány Mts. were considered as part of the rigid Pannonian massif until the beginning of the seventies. In the sense of the classicists of Alpine geology it represented a median mass („Zwischengebirge"). New facts, however emerged, which forced to revise this opinion. B. GÉCZY (1973) proved by the analyses of the fauna of Jurassic ammonites from the Villány Mts. close relations to the northern (Subboreal) associations. By drilling works the Szolnok trough with flysch filling of Upper Cretaceous-Paleogene age was discovered directly amidst the so called Pannonian massif (L. KŐRÖSSY, 1959); K. BALOGH (1964) proved the Dinaride character of the Bűkk Mts.

The northern provenance of Jurassic ammonites in the Villány Mts., the presence of the Keuper facies in the Mecsek and Villány Mts. as well as the amount of clastic material building up the Gresten formation of the Mecsek

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Mts. were a stimulation to formulation of hypotheses, according to which the original sedimentation areas of these two mountains were situated at the southern margin of the stable Europe. In accordance with the mobilistic ideas, which rapidly took up prevalence under the influence of new global tectonics, the far-reaching transportation of the Mecsek and Villány Mts. to the present-day positions was explained by strike-slip movement at a transform fault.

According to the scheme of S. KOVÁCS (1980, fig. 5) Mecsek and Villány have formed during the Triassic the direct continuation of the Tatricum towards the East; their continuation was the Zemplín unit and the Bihorian „autochthon". We designate it as variant A.

In the year 1984 M. KÁZMÉR — S. KOVÁCS — Cs. PÉRÓ modified this in the sense that the Villány Mts. were situated in continuation of the Tatricum and were linked with the Bihor Mts. whereas the area of Mecsek Mts. was situated north of them (in the substratum of the present-day Flysch Carpathians) in close proximity to the Scythian platform. (Variant B).

A new variant „C" of original location of the Mecsek and Villány Mts. sedimentary basins was presented and argumented by the Hungarian Working Group of IGCP Project No. 198 („Evolution of the Northern Margin of the Tethys") at he working session in September 1986 in Zürich. A part of this elaboration was the paleogeographical scheme of the Pliensbachian, according to which the Mecsek and Villány basins were originally situated immediately at the margin of stable Europe (Bohemian massif) in direction of continuation of the Gresten zone of the Alps.

On the other hand, the Bihor zone of the Apuseni Mts. was linked with them. According to this scheme, south of them was the Central-Penninic zone including the Hochstegen ridge, with which in eastern direction the Papuk (?), Békés (?) and Codru zones were linked. South of them the South Penninic trough followed, at the southern margin of which the Czorsztyn, Pieninic, Klape and Manin zones and the Tatride zone, the direct continuation of the Lower Austroalpine zone, were situated. The units of the Klippen Belt and Tatricum, according to this scheme, formed a part of the African margin of the Tethys whereas the Mecsek and Villány Mts. were situated at the opposite side of the oceanic trough at the shelf of the European continent. This is a conception diametrically different from the preceding two variants.

Besides that, in this sketch the Mecsek Mts. are placed roughly to the substratum of the Silesian unit and not to the substratum of the Flysch Belt at the boundary of the West and East Carpathians as it was in the preceding works. In the work by M. KÁZMÉR (1986, p. 86) is a mention not commented nearer that the Mecsek Mts. have relations to the Maramureś flysch unit of Rumania and the Pieninic Klippen Belt of the Carpathians.

In our opinion — and so we idenfity with the opinion of M. MAHEĽ (1980, 1983) — the sedimentation areas of the Mecsek and Villány Mts. were never a part of the sedimentation area of the West Carpathians. In the next we shall mention the reasons against all three variants: variant A: S. KOVÁCS (1980, 1982, 1984), variant B: M. KÁZMÉR, S. KOVÁCS — Cs. PÉRÓ (1984) and variant C: the Hungarian Working Group of IGCP No. 198 (1986).

We begin with the analysis of relations of the Mecsek-Villány Mts. with the units of the West Carpathians, first following the individual stratigraphical levels.

Comparison according to stratigraphic horizons

Precambrian. The thick layers of crystalline limestones of the Ófalu phyllite complex in the Mecsek Mts. were ranged by B. JANTSKY (1979) to the Proterozoic. In the table of the lithostratigraphical formations of Hungary (J. FÜLÖP et al. 1983) this complex was assigned to the Devonian, mainly for the occurrence of carbonates. After paleontological evidence of the Silurian in the normal overlier of this complex (H. KOZUR 1984) we considered the Proterozoic age of the Ófalu complex as proved. The abundant presence of carbonates in the Proterozoic testifies against competence to the Proterozoic platform (variant B, C). Carbonates are also missing in the complex of crystalline schists of the Vysoké Tatry Mts. (variant A).

Silurian. The presence of the Silurian in the Mecsek Mts. (M. KOZUR 1984) excludes the possibility of correlation with the Tatricum (variant A). We suppose that just this datum was a stimulation to shift the original Mecsek area to the substratum of the Flysch Belt, to the neighbourhood of the Scythian platform where the non-metamorphosed Silurian is known.

Carboniferous. The clastic Stephanian sequence with seams in the Mecsek and Villány Mts. has no analogy in the Tatricum (variant A).The blocks of coal in the West Carpathian Flysch zone as well as in the Klippen Belt are not of Stephanian but always of Namurian age (against C).

Permian. The uranium-bearing Permian in the Mecsek Mts. is strongly developed (2—3 km thickness) with a layer of 150 m rhyolites. In the Tatricum of the West Carpathians it nowhere attains such thicknesses and rhyolites are found sporadically in the Malé Karpaty and Považský Inovec Mts. only. In the Middle Permian of the Mecsek Mts. a palynoflora containing Gondwanian elements (A. BARABÁS — STUHL 1981) occurs, in the Permian palynoflora of the West Carpathians Gondwanian elements have not been found in spite of numerous analyses.

Lower Triassic. The Jakabhegy Formation, a 400 m thick complex of sandstones and conglomerates, in which pebbles of quartz porphyries are dominating and pebbles of granites are also present (M. KASSAI — E. NAGY in G. CSÁSZÁR — J. HAAS 1984), with pebbles up to 30 cm, has no analogy in the whole West Carpathians.

Middle Triassic. The presence of vermicular limestones in the Middle Triassic of the Villány Mts. hardly may be considered as an argument in favour of the neighbourhood with the Tatricum (S. KOVÁCS 1980 and other) as this facies is generally spread. The fauna of brachiopods, lamellibranchs, conodonts and ammonites of the Mecsek Mts. (see M. KÁZMÉR 1986, p. 83) is nowhere known

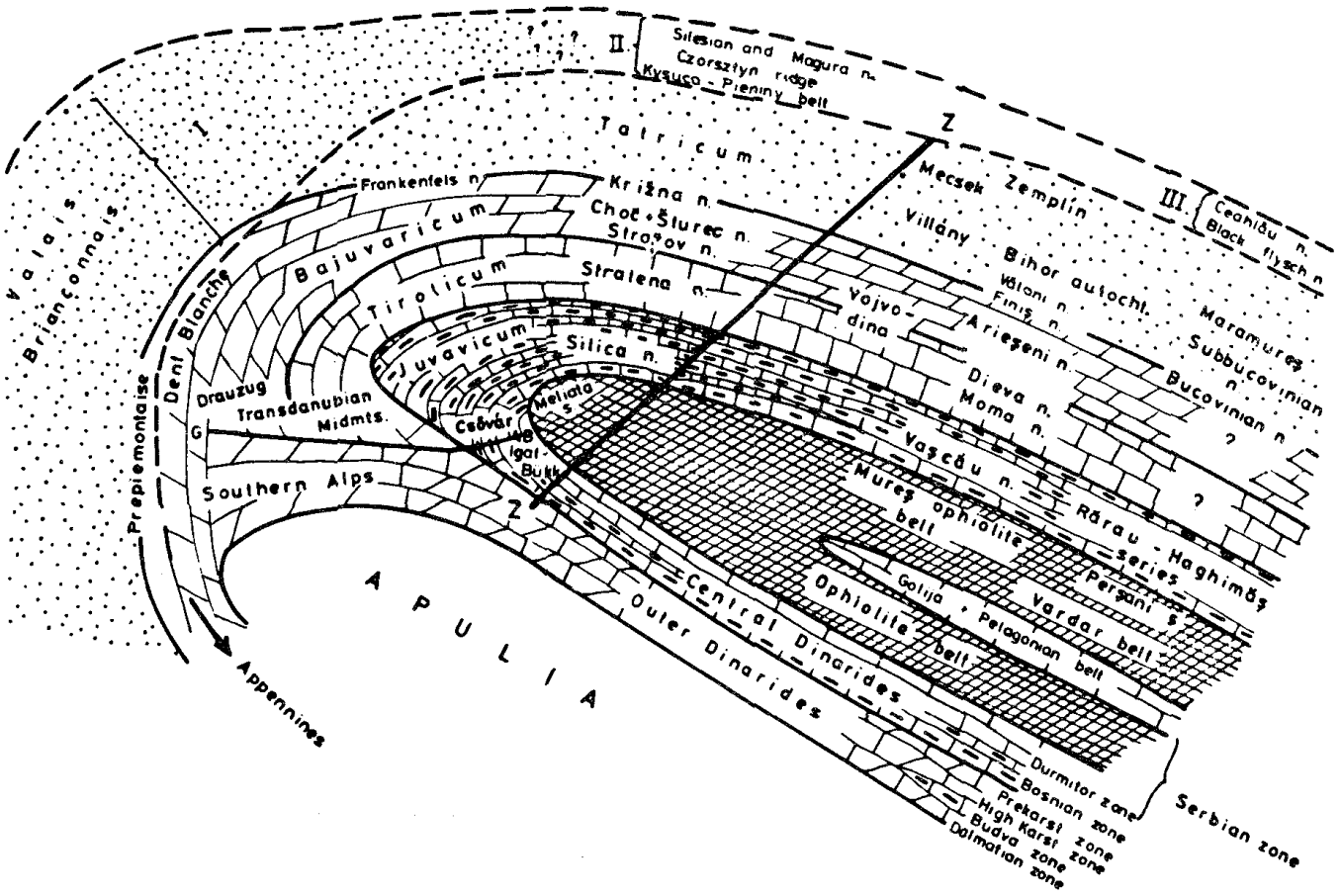

Fig. 1 S. Kovács (1982, Fig. 3): Original arrangement of the Norian isopic zones in the Alpine-Carpathian-Dinaric system.

from the Middle Triassic of the Tatricum, neither intercalations of crinoidal limestones (L. RÁLISCH in G. CSÁSZÁR — J. HAAS 1984 — Misina Formation). In the rich conodont fauna in the Pelsonian *Gondolella bifurcata hanbulogi* dominates (S. KOVÁCS — J. PAPŠOVÁ 1986), an element typical of the southern part of the Tethys, which although does not confirm, but certainly indicates the southern position of the Mecsek Mts. in the Triassic. E. NAGY — L. RAVASZ — BARANYAI (1986) mentioned a tuffitic layer with kaolinite and siderite from the base of the Ladinian complex in the Mecsek Mts. In the Tatricum such a horizon is nowhere known.

Upper Triassic. The Keuper facies from the Mecsek and Villány Mts. is compared with the Carpathian or Germanic Keuper. Composition of the clastic material has not been investigated from this viewpoint so far. Below the „Keuper" in the Mecsek Mts. however, is lying a 120 m thick sequence of black limestones and marls with gastropods and ostracodes of a freshwater environment (Kantavár Formation) whereas in the Tatricum and Fatricum of the West Carpathians are always light-coloured dolomites below the Keuper. We remark that the Upper Triassic in red clastic-lagoonal development is also known from North Africa. According to H. Kozur (oral communication) the rich ostracode fauna from the Keuper in the Mecsek Mts. has no one species common with the ostracode fauna of the Germanic Upper Triassic (whereas the ostracode associations in Germany and the Pericaspian region are almost identical).

As no doubts were expressed about common competence of the Mecsek and Northern Apuseni Mts. to the Tisia microplate during the Triassic, we consider as necessary to mention an important datum about the presence of conodonts and holothurian sclerites in the Cordevolian of the Valani nappe (Northern Apuseni), which belong to the West-Mediterranean-Arabian faunistic province (H. KOZUR 1979). The mentioned elements are typical of the southern margin of the Tethys, they were found nowhere in the West Carpathians, Eastern Alps, neither in the Germanic region, testifying against all three mentioned variants of location of the Mecsek Mts.

In the Mecsek Mts. the continental Rhaetian is found; such a facies is known in one core mountains of the West Carpathians only — in the Vysoké Tatry Mts. From total 7 spore species of the Upper Carnian-Norian-Rhaetian (Karolina-vőlgy Formation), mentioned by G. LACHKAR — G. BÓNA — M. J. PAVILLON (1984), with 16 species mentioned from the Norian and Rhaetian of the Vysoké (Západné) Tatry Mts. (J. MICHALÍK — E. PLANDEROVÁ — M. SÝKORA 1976) only one species is common — Ovapollis ovalis.

Liassic. The greatly developed Gresten coal-bearing formation of the Mecsek Mts. (500—3500 m, according to other estimations 200—1200 m), is the most noteworthy member of these small mountains. There are 38 exploitable coal seams. We mention for comparison that in Gresten (Eastern Alps) its thickness is only 60 m with 2 coal seams, in Bihor 170 m and 1 coal seam, in Brašov 200 m and 1 coal seam, in Rešica (Banat) 250 m and 2 coal seams, in Anina (Banat) 300 m and 6 coal seams (E. NAGY 1969).

In the contact region of the South Carpathians and Balkans on the territory of Yugoslavia are 2—3 coal seams of thickness up to 2,5 m in the Lower Liassic (G. LACHKAR et al. 1984). In continuation, in the westernmost part of Bulgaria, are further occurrences of Liassic coal (J. JOVČEV 1965, map): in the Forebalkan two localities west of Michajlovgrad, one west of Vraca, in the southern zone two localities close to the frontier with Yugoslavia (in other areas of Bulgaria only weakly coal-bearing Jurassic is indicated near Teteven and Kolarovgrad).

The greatest affinity to termination of the South Carpathians results from it. In the work by E. NAGY (1969) it is considered as „paleogeographical convergence", in our opinion it indicates spatial linking of facies with the Mecsek Mts.

In the Tatricum there are no Gresten beds; the deposits which were considered as the Gresten beds (Kopieniec Formation) correspond to the Kalkburg beds of the Alps. This testifies against variant A. In the Pieninic Klippen Belt the so called Gresten beds are mentioned from two klippes of the Kysuca or Nižná development (locality Krásna Hôrka in Orava and locality Jedlovinka near Zázrivá of thickness 50 m and 30 m). They are formed by sandstones with arietids and shales without traces of coal. The whole formation is exclusively in marine development. In the Czorsztyn unit the Lower Liassic is different (the Lower Sinemurian with lumachelle-crinoidal limestones with gryphei). No fragments of Liassic coal are known from Cretaceous and Paleogene clastic deposits of the Flysch Belt although we know fragments of Upper Carboniferous coal from there (E. TURNAU 1970) and even no Liassic sporomorphs although redeposited Permian and Lower Triassic sporomorphs are present (T. KORÁB — P. SNOPKOVÁ 1972). It is improbable that the thick sequence of the Gresten beds would not had been uncovered when we know pebbles of the Upper Liassic in Fleckenmergel development from the Magura unit (Strihov beds). This testifies against variant B. The exotic pebbles of the Silesian unit, in spite of great diversity, have provided no Liassic rocks, what testifies against variant C. The thickness of Fleckenmergel (Allgäuschichten) in Mecsek is 2500 m, the maximum in the West Carpathians si 250 m.

In the Gresten beds of the Mecsek Mts. a layer of 10 m rhyolite tuffs is known in the Upper Hettangian (or Lower Sinemurian) (M. KÁZMÉR 1986), established in the whole observed course of 25 km. One of the tasks should be seeking for the volcanic centres of this volcanism. There is no evidence of volcanism in the Liassic from the whole region of the West Carpathians (testifies against variant A). Neither in the Gresten beds of the Eastern Alps it is known. In boreholes below the fore-deep A. TOLLMANN (1985, p. 420) mentions the Porrauer Diabas-Komplex from the base of the Mesozoic. The mentioned „metadiabases" and sediments connected with them are ranged to the Upper Liassic-Lower Dogger. They are passing laterally into the „Untere Quarzarenitserie" with intercalations of coal and Upper Liassic-Lower Dogger sporomorphs (F. BRIX et al., 1977); A. TOLLMANN designated them originally as the Gresten beds (on the Czechoslovak side they should pass into the Bořetice and Diváky beds); later (A. TOLLMANN 1985) he compares them with the Waidhofen beds. The mentioned volcanics could not have been the source for rhyolite tuffs in the Mecsek

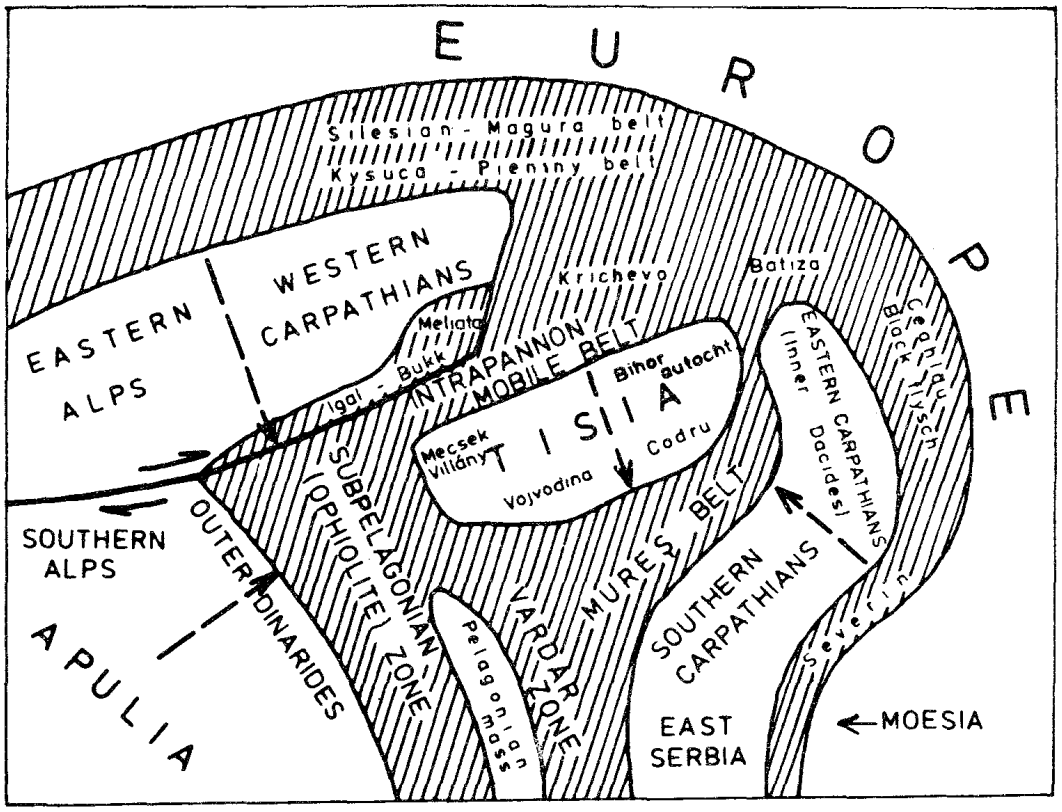

Fig. 2 S. KOVÁCS (1982, Fig. 4): Approximate position of Tisia at the end of the Jurassic — beginning of the Cretaceous.

Mts., because they are basic on the one hand and essentially younger on the other hand. If the Mecsek Mts. were situated in the substratum of the Carpathian Flysch Belt, the pyroclastic material should be derived from volcanoes of the adjacent platform in Poland. Such a volcanism is, however, not known (P. A. ZIEGLER 1982, p. 18), what testifies against variants B, C. It is remarkable that trachyte and diabase volcanism is mentioned from the Liassic of the Getic nappe in the South Carpathians, however, from a higher level (Pliensbachian-Toarcian) overlying the Gresten coal-bearing formation. In spite of that we consider this spatial relation as possible; for instance, in the Barrandien thin intercalations of acid pyroclastic rocks are known in the Lower Cambrian, but acid lavas are found in the Upper Cambrian only.

Dogger — Malm. The higher Jurassic members are generally of similar development in the Villány Mts. and Tatricum. Then, it is necessary to stress,

we cannot explain the faunistic differences between the mentioned regions established by B. Géczy (1973) and A. Vörös (1977, 1984) by facial causes and the more they are of paleogeographic importance. The hiatus before the Dogger, stromatolites in the Lower Callovian, red limestones in the Bathonian and perhaps also grey limestones with „pelagic oolites" in the Villány Mts. (Szársomlyói Limestone Formation-Oxfordian-Tithonian), which could correspond to the microoncolite limestones of the High Tatric unit were probably a stimulation for S. Kovács (1980) to formulate variant A. It is, however, necessary to be aware of the fact that stromatolites were found in one profile of the High Tatric unit and in no other core mountains in the Tatricum (otherwise they are common in this horizon of Tethyan Europe, e.g. in the Betic cordiller). The ammonite fauna in the Callovian of the Villány Mts. belongs to the richest in the world, contrasting with the poor fauna from limestones in the Vysoké Tatry Mts. In the Mecsek Mts. red nodular limestones are found in the Bathonian, Oxfordian and Kimmeridgian-Lower Tithonian (M. Kázmér 1986). In the Flysch Belt of the West Carpathians blocks of red nodular limestones are known, but always with Oxfordian fauna only (Krosno unit near Bachovice in Poland, Magura unit near Cetechovice, Moravia). In the flysch of eastern Slovakia (Strihovce beds) are pebbles of various Jurassic facies, however, there are no red limestones among them (against variant B). In the Mecsek Mts. are no traces of such a typical Tithonian facies as the Štamberk limestone with detritus of coral reefs (against variant C).

Lower Cretaceous. A conspicuous phenomenon in the Mecsek Mts. (less in the Villány Mts.) is a strong alkalic basalt volcanism within the range of the Berriasian-Valangian (maximum) to Barremian. As an abundant volcanism of similar character (more ultrabasic-teschenites) is in the Silesian unit of the Flysch Belt roughly synchronous (sporadically the Tithonian, Valanginian to Lower Aptian — E. Menčík et al. 1983), this circumstance was perhaps the main stimulation for formulation of variant C. The essential difference, however, is that in the Silesian unit it accompanies the preflysch and flysch formation whilst in the Mecsek Mts. typical pelagic limestones.

Pelagic marls with olisthostromes of Hauterivian—Barremian age with abundant basalt conglomerates (Magyaregregy Conglomerate Formation) have nowhere an analogy in the West Carpathians. On the contrary to variant A it may be still remarked that in the High Tatric unit volcanic rocks (limburgites) are found in the Upper Tithonian—Berriasian only. The extent of basic volcanism in the Mecsek Mts. and in boreholes in the substratum of the Neogene is quantitatively so significant that M. Książkiewicz (1977, fig. 3) supposed the existence of an oceanic crust in the Jurassic-Lower Cretaceous only in this zone whereas he considered all zones of sedimentation of the West Carpathians as situated on a continental crust.

Location of the Mecsek-Villány Mts. and Northern Apuseni at the northern margin of Tethys is contradicted by the presence of bauxites in the Valanginian-Barremian in the Villány Mts., Bihor „autochthon" and Valani nappe. Formation of bauxites in these more northern geographical latitudes is improbable

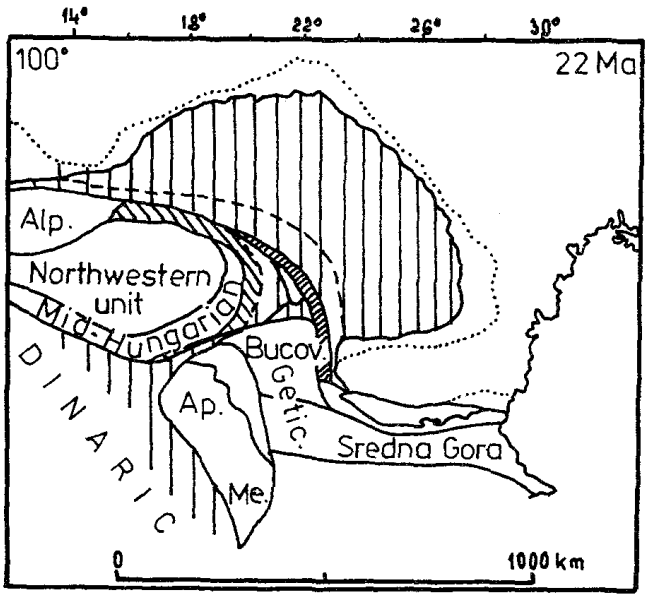

Fig. 3 Situation of Tisia (Me = Mecsek Mts., Ap = Apuseni) at the beginning of the Miocene in the kinematic model of Z. BALLA (1986, Fig. 2).

already for paleogeographical reasons. Nowhere in the northern-external zones, even not in the Eastern Alps, bauxites older than the Upper Cretaceous are known. In the West Carpathians nowhere hiatuses are known in the Lower Cretaceous, accompanied by bauxites, even not in the Pieninic Klippen Belt; there are no traces after redeposited Al-hydroxides also in the Flysch Belt. The occurrences of bauxites in the West Carpathians are distinctly post-Middle Cretaceous (Senonian, certainly pre-Eocene). On the contary to that, e.g. in Yugoslavia, numerous deposits of bauxite covered with the Valangian are known: Vršar, Rovini, Nijegas in Montenegro, elsewhere covered with the Barremian-Aptian: Bosenska Krupa, Mljet, Mikšič (J. Ilavský et al. 1979, p. 170). In the Villány Mts. a higher horizon of bauxites is also found, which could be of Albian age. Albian bauxites ar also found in the Bakony Mts. (Alsópere Bauxite Formation) and Getic nappe of the South Carpathians (Hateg basin, M. SĂNDULESCU in M. MAHEĽ et al. 1974, p. 273).

It results from the above mentioned that the Mecsek—Villány—Northern Apuseni must have been in southern positions and already in areal proximity to the Bakony Mts. in the Lower Cretaceous, as testified also, besides the bauxites, by the presence of the Lower Albian pachyodont facies in the Bakony, Villány, Bihor Mts. (such Albian facies is nowhere known in the West Carpathians) and layers of characeans in the Lower Cretaceous: Bakony, Villány, Bihor Mts. (not found in the Lower Cretaceous of the West Carpathians).

Tectonic difficulties of the proposed variants

Displacement is supposed along transform faults. In all three variants the Mecsek Mts. must have crossed several distinct sedimentary — facial zones during the displacement. Such transform faults of transversal orientation must have been manifesting significantly also in the following history and with formation of tectonic units, however, we have no evidence of it. In the variant A. S. Kovács (1984) mentions that displacement of the Mecsek Mts. took place already in the Jurassic, what is very improbable (in variant C they even must have crossed a trough with just spreading oceanic floor). If we place this process into the Lower and Middle Cretaceous, the Mecsek Mts. would have moved against the originating nappes, transported in opposite direction. At the same time it would be difficult to explain, why no nappe was overthrust on the Mecsek Mts. under these circumstances.

Relations of the Mecsek Mts. and South Carpathians (Banat)

So far as the area of sedimentation of the Mecsek Mts. was, in fact, located originally at the margin of the North European platform in the Jurassic, we suppose that it is necessary to seek for spatial relations rather to the South Carpathians than West Carpathians. We call attention to these following facts.

The occurrence of metamorphosed limestones in crystalline rocks of the Mecsek Mts. as well as in the Prebaikalian complex of the South Carpathians (gneisses, amphibolites, marbles). In both regions the Upper Carboniferous and Permian are in continental development, in both regions coal seams are present in the Stephanian. The Permian contains only acid volcanics in both regions. In the Lower Scythian of the Mecsek Mts. and Getic nappe are conglomerates, they are missing in the West Carpathians except sporadical angular fragments of vein quartz in basal quartzites of the Tatricum. The pebbles of red granites present in these conglomerates of the Mecsek Mts. could be rather derived from crystalline rocks of the South Carpathians. As the Triassic of the Danubian autochthon was removed by erosion, it cannot be compared directly; however, just the great erosion affecting even the Permian indicates the possibility that the clastic material for the Gresten complex of the Mecsek Mts. was supplied from there. After the Mecsek Mts. just in the Banat we are finding the greatest number of coal seams in the Lower Liassic of the whole Alpine — Carpathian region. In the South Carpathians as well as in the Mecsek Mts. the continental Lower Liassic is gradually passing into the marine Middle Liassic. In the South Carpathians trachytes, which are the only acid volcanics known in the Jurassic in the East-Alpine-Carpathian region and could have spatial linking with Lower Liassic acid tuffites of the Mecsek Mts. (the rocks from exposures are, however of younger, Middle Liassic age), are resting on the Lower Liassic. The horizon with Fe-oxides is in the Upper Bathonian-Lower Callovian in the Danubian autochthon, also in the Villány Mts. In both regions are two horizons of red

nodular limestones, one in the Dogger, the second in the Malm. In the Mecsek Mts. the lapilli of basic volcanics were found in the Kelloway-Oxfordian (I. FÖZY — Cs. LANTAI — K. SCHLEMMER 1985). There are no traces of volcanic rocks of this age in the West Carpathians. In the East Carpathians an Oxfordian volcanism is know near Poiana Botizei (G. BOMBITA — H. SAVU 1985). In the Getic nappe is a Tithonian-Neocomian pelagic facies as in the Mecsek Mts. and a typical Barremian-Aptian Urgonian facies as in the Villány Mts. The carbonate flysch Sinaia Formation of the Severin nappe contains abundant Tithonian--Neocomian volcanics, which can be compared with volcanics of the Mecsek Mts. (however, linked with the flysch complex and not with pelagic limestones as in the Mecsek Mts). In the Getic nappe bauxites of Albian age are found, perhaps analogous with the higher horizon of bauxites in the Villány Mts.

The rotation of the Mecsek by more han 90° is most probable also in the opinion of several Hungarian geologists (for instance, Z. BALLA 1986). This implies that the measured directions of supply from the north (mainly at Liassic clastics) testify to the supply from the east supposed by us.

The possibility of linking of the Mecsek Mts. with the South Carpathians is also evident from the works of some Hungarian geologists. For instance, A. VÖRÖS (1984) writes that the Jurassic fauna of molluscs and brachiopods from the Mecsek and Villány Mts. has closest relations to the fauna from the Apuseni, East Carpathians, South Carpathians, Germany and France.

We are finding the Mecsek Mts. with the South Carpathians also in the schemes of the kinematic model of Z. BALLA (1986), in his opinion still at the beginning of the Miocene the Mecsek Mts. were situated in southern neighbourhood of the Geticum, according to the sketches they underwent clockwise rotation and a movement towards the west to their present-day position during the Miocene. With such a solution the necessity of conspicuous crossing of so many facial zones as, e.g. in variant A, could be abandoned. The model of Z. BALLA has some points contiguous to our opinion of location of the Mecsek Mts. in neighbourhood of the Geticum, of their former more southern position. The difference is mainly that westward movement of the Mecsek Mts. in our opinion was probably taking place still in the Lower Cretaceous and not in the Upper Miocene. If at the beginning of the Miocene the Mecsek Mts. were actually in the same position as drawn by Z. BALLA (1986), then it is difficult to uderstand why they were not affected even by traces of banatite volcanism. The disintegration of Tisia still before the Middle Cretaceous provided us the possibility to understand why the Northern Apuseni have a typical nappe structure and the Mecsek Mts. have not.

According to the kinematic model of Z. ROTH (1986) the „Transylvanian block" (thus also the Mecsek Mts.) was situated by several hundreds of km more southerly, what would explain well formation of bauxites on it during the Lower Cretaceous. Z. Roth considers a far-reaching movement to the north with a weak western component only (it is a model diametrically different from all three variants A, B, C, which required a movement to the south or SW).

We show also a further possibility, which explains the affinity of the Triassic

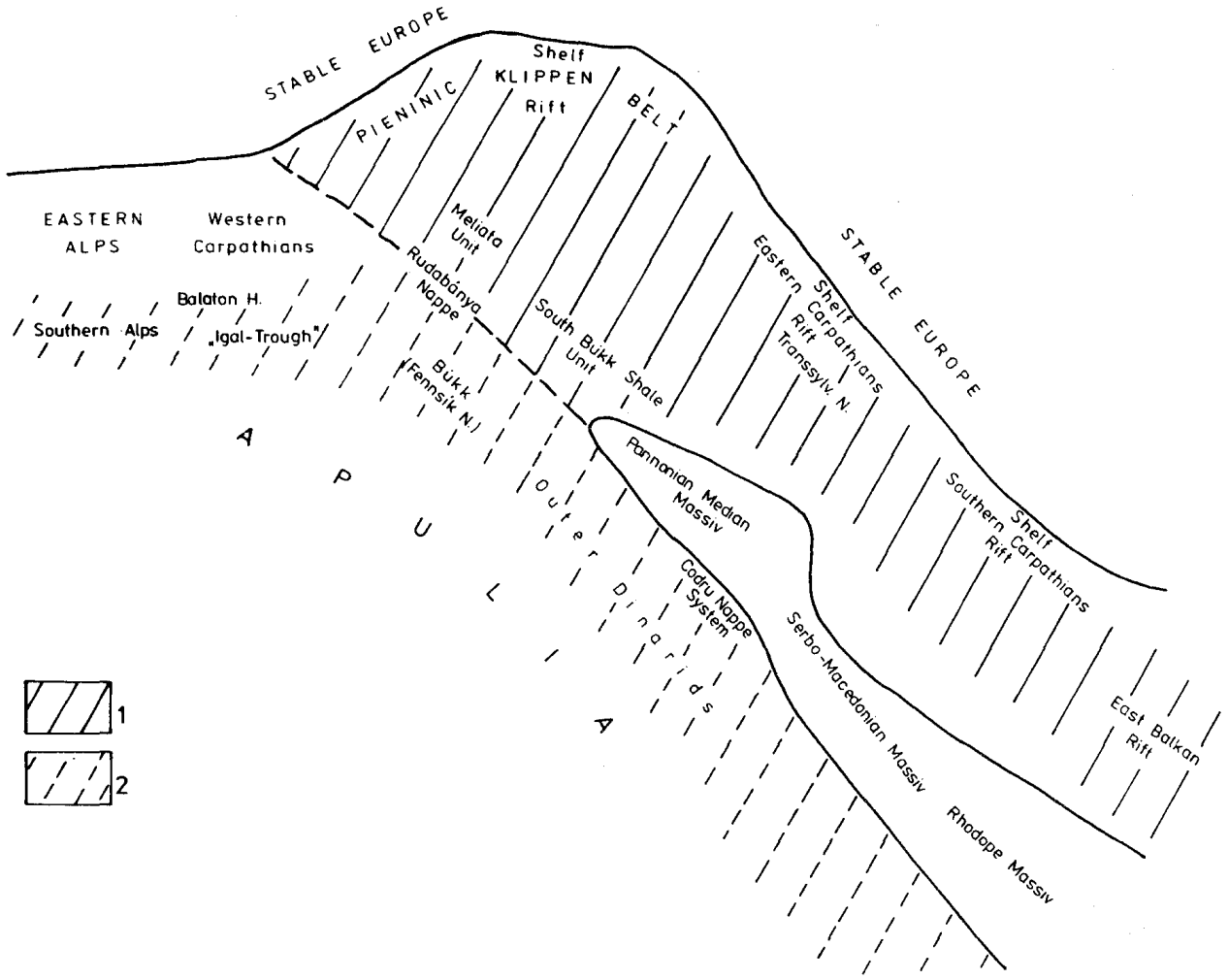

Fig. 4 Highly schematized idea of the paleogeographical situation in the Pelsonian to Lower Carnian according to H. KOZUR—R. MOCK (1986, Fig. 2a). 1. Eastern rift system, 2. western rift system, less active in that time.

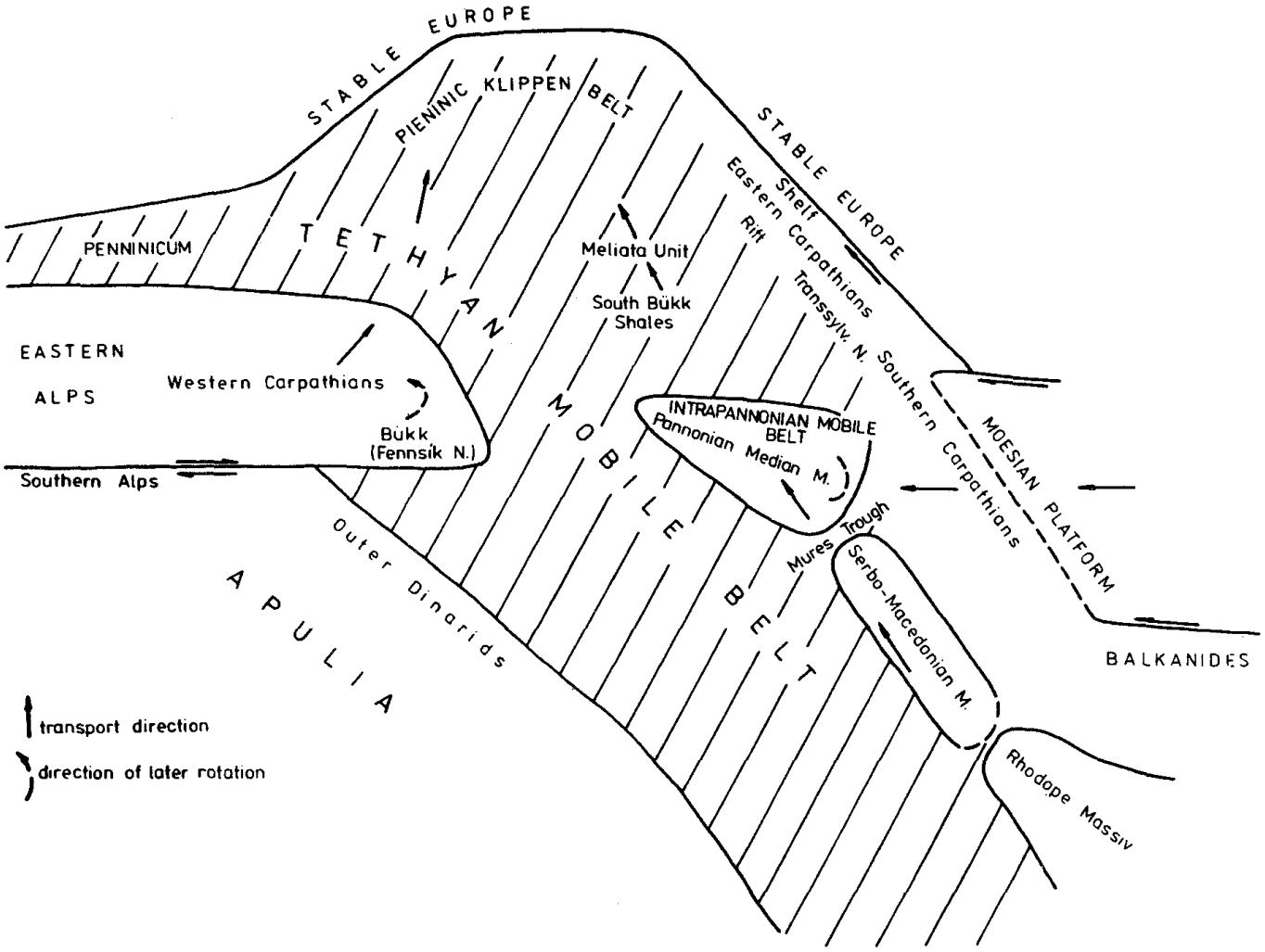

Fig. 5. Highly schmatized idea of Lower Malm paleogeography (according to H. KOZUR—R. MOCK 1986, Fig. 3).

fauna from the Mecsek Mts. to the southern faunas and of the Jurassic faunas from the Mecsek Mts. to northern faunas.

The idea of the position of the Mecsek and Villány Mts. according to H. Kozur and R. Mock (1986) tries to solve the problems in a complex way: Tisia, the Serbo-Macedonian massif and Rhodope massif (originally forming one whole) were the margin of Apulia in the Triassic. Latest in the Ladinian these units were separated from stable Europe by a eastern rift oceanic trough, which was gradually opening from east to west. In the Upper Triassic the western rift system (west and south of Tisia) began to be formed, which was little active at the beginning and made faunistic communication between Tisia and the shelf of Apulia possible (Fig. 4).

The area of sedimentation of the Eastern Alps and West Carpathians is still in close neighbourhood of stable Europe in the Triassic, as manifested by clear sedimentological and faunistic relations.

In the uppermost Triassic the eastern rift started to close (Kimmerian movements and Tisia came nearer to the margin of stable Europe.

An essential paleogeographical turn took place in the Jurassic (Fig. 5). With gradual opening of the oceanic western rift Tisia was cut off from the southern margin of Tethys; at the same time the eastern rift closed and faunistic and sedimentological influences between Tisia and stable Europe set in. Both regions are characterized by a fauna of the northern shelf of Tethys (Submediterranean province of B. Géczy 1973).

In the Jurassic the western rift (Vardar ocean) was gradually prolonged to the west, the Penninic trough or trough of the Vahicum and Penninicum was opening, cutting off the region of the Eastern Alps and West Carpathians from the shelf of stable Europe.

The whole region south of the Penninic rift became a part of the African or Apulian shelf, what is also distinctly manifested by faunistic relations. The regions with not only distinct faunistic but also sedimentological relations to stable Europe in the Triassic were inhabited by southern Tethyan faunas in the Jurassic (Mediterranean faunistic province of B. Géczy 1973).

Translation: Jozef Pevný

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MILAN MIŠÍK — RUDOLF MOCK — MILOŠ RAKÚS — ANTON BIELY

Sedimentačný priestor Mecseku a Severných Apusenov sa nenachádzal v Západných Karpatoch

Resumé anglického textu

Sedimentačný priestor Tisie nebol bezprostredným pokračovaním priestoru Západných Karpát. Porovnania fácií ukazujú, že bihorská jednotka a príkrov Valani nie sú ekvivalentami tatrika a krížňanského príkrovu. Z ďalších argumentov vyberáme: prítomnosť uhlia stefanu a najmä liasu v Mecseku, bauxitov v spodnej kriede Villány, Bihoru a príkrovu Valani, pyroklastické vložky v liase a najmä mohutný bazaltový vulkanizmus v spodnokriedových vápencoch Mecseku, porovnávanie hiátov, chýbanie tak charakteristických západokarpatských elementov ako je „melafýrová séria" permu a lunzské vrstvy karnu, prítomnosť južných prvkov v triasových konodontoch, skleritoch holotúrií a ostrakódoch Tisie, chýbanie geologických pozorovaní o premiestnení Mecseku-Villány zo severného okraja západokarpatského priestoru do dnešnej pozície. Je upozornené na úzke vzťahy Tisie k Južným a Východným Karpatom.