The Distribution of the Adriatic-Ionian Sedimentation Area / Greece

by

G. THORBECKE
Geologisches Institut, Freiburg

The adriatic-ionian facies consists mainly of three formations : **1.** Dolomites (Triassic-Liassic), **2.** Cherty Limestones (Jurassic - Eocene) 3. Flysch (Eocene - L. Miocene). — That means shelf sedimentation from Triassic to Liassic and pelagic sedimentation from M. Jurassic to L. Miocene. The outcrops of the adriatic-ionian sediments are shown in fig. 2. According to the outcrops and partly new correlations [KUSS & THORBECKE 1974] the adriatic-ionian sedimentation trough follows from the Peloponnesus the south Aegean insular arc. This much wider distribution of the adriatic-ionian sediments has severe paleogeographic and geodynamic consequences :

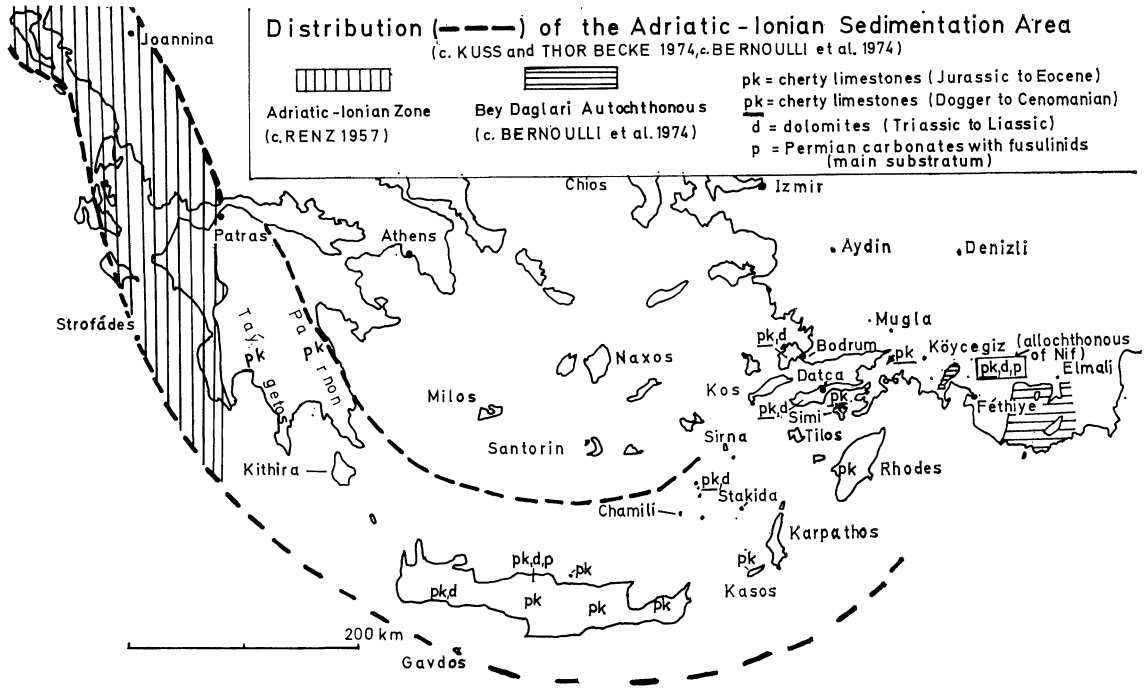

FIG. 1. — Table of correlation of Adriatic-Ionian sediments (c. KUSS & THORBECKE 1974, p. 62-71).

1. There must have been an extension of the adriatic-ionian trough east of Rhodes because corresponding sediments appear in Southwest Turkey. But the Turkish adriatic-ionian sediments directly east of Rhodes are allochthonous. Either the adriatic-ionian trough extended from Rhodes to the north of the

Rapp. Comm. int. Mer Médit., **23**, 4a, pp. 187-190, 1 fig., (1975).

	W. Greece/Ionian Islands (RENZ 1955, p. 14)	Peloponnesus (BIZON & THIEBAULT 1974)	Crete	Kasos	Rhodes MUTTI *et al.* 1970	SW Turkey/Islands north + west of Rhodes, BERNOULLI *et al.* 1974
Flysch	Flysch (U. Eocene - Burdigalian) big thickness	Flysch, relicts (L. Oligocene)	Kalkphyllit/ Kalkmergel, relicts, Globigerinids,? Eocene		Katavia-Flysch, ∿1500 m (L. Oligocene) Kakoskala Marly Limestone 80 m, (M.Eoc.-U.Eocene)	
Cherty Limest (pk)	Plattenkalke (Paleoc.-Lutetian) Hippuritenkalke (U. Cretaceous) Vigla-Schichten (Jura.-L.Cretac.)	Platten- Kalk	Talea Ori Plattenkalk ∿ 1500 m (Jurassic - ? Eocene)	Platten-Kalk ?	Akramitis L.∿480 m (Turonian - M. Eocene) Angremaris L. ∿ 170 m (Kimmeridge L. Cretaceous) ?	Karabörtlen-Formation Camova-F. (Tur.-Maastr. (not of Ionian facies) Cal Dag Limestone (Dogger-Cenomanian ∿ 850 m
	Posidonienschiefer/Ammonitico Rosso (U.Liassic)	?	Holszcheit-Schiefer (W.Crete only)			Gereme -
Dolomites (d)	Pantokratorkalke (U. Trias.-M.Lias) Hauptdolomit (U. Triassic)	?	Talea Ori Stromatolith-Dolomit, ∿ 1100 m U. Trias.-Lias			Formation, ∿ 400m (Triassic-Liassic)
	Fustapidima-Kalke (Carnian) Gypsum (Triassic) (c.BP Ltd. 1971)		Emersion Sisses-Schichten ∿ 620 m (Triassic) neritic limest) Fodele-Formation ∿1700 m, mainly limestones, fusulinids (M. Permian-U.Permian)			Red arkoses Limestones, Dolomites with neoschwagerinids

Menderes Massif or to the South of Southwest Turkey during Triassic to L. Cretaceous. That means that the Lycian nappe with adriatic-ionian sediments originated from the north of the Menderes Massif or from the south of Southwest Turkey. In any case somewhere between Rhodes and Southwest Turkey should exist a borderline which separates allochthonous from autochtonous adriatic-ionian sediments.

2. The Cretean Tripolitza sediments, permotriassic phyllites, shallow marine limestones (Jurassic - Biarritzian/Priabonian) and flysch (mainly Preabonian) are not autochthonous as assumed up to now, they are allochthonous and consequently the Permian phyllite and the other Tripolitza sediments of Peloponnesus, too. In Crete and the Peloponnesus cristalline massifs do not exist as it had been thought before. The transition of the adriatic-ionian trough to a neighbouring sedimentation area could exist near the Argolis peninsula.

3. According to RENZ [1957] the adriatic-ionian sedimentation area was situated between Crete and the Cyrenaica. Now we know that it was situated further north. From hence arises the problem : Which Preneogene rocks form the Eastern Mediterranean Ridge? The drilled samples give no knowledge of it. According to the geology of Cyprus the Preneogene rocks of the Eastern Mediterranean Ridge could consist of pelagic sediments (Triassic with cherts, radiolarites, tuffs and Halobies; Upper Cretaceous to Paleogene cherty limestones, HENSON *et al.* 1949) and of ophiolites (periodites, serpentinites, diabases; Troodos Massif). So Cyprus might be a key-area regarding the geology of the Eastern Mediterranean Ridge.

***

Interventions

D. Richter. — You put the so-called " cherty limestone group " into the Adriatic-Ionian sedimentation zone. After my knowledge the carbonate sequence of this " cherty limestone group " includes on the Peloponnesus the Oligocene, while in the Ionian zone proper in continental Greece the limestone deposition was terminated in the Priabonian and the Oligocene is represented by the conformably overlying flysch. Furthermore, the limestones of the Ionian zone show a completely different facies compared to that " cherty limestone group ". Thus it seems likely that the sedimentation area of the " cherty limetone group " on the Peloponnesus forms a particular new zone wedging between the Ionian zone and the Gavrovo Tripolis zone and probably widening towards Crete.

Réponse — The flysch of the Adriatic-Ionian autochthonous of Peloponnesus « un flysch calcaire à l'Oligocène inférieur » started at L. Oligocene, too (c. BIZON & THIÉBAULT 1974, *Comptes-rendus*, 278, Série D 9-12).

The two equivalents " Vigla-S., Hippuritenkalke, Plattenkalke " of W. Greece/Ionian Islands and the " Plattenkalk " of Peloponnesus are *both* cherty limestones (besides low epizonal metamorphism of the " Plattenkalk ") and both have the same tectonic position.

K. O. Heimann. — You mentioned the Triassic gypsum substratum of the Ionian zone in Western Greece.

I remember having heard of Triassic gypsum on Crete. — If they don't occur in the tectonical unit described, do you know to which nappe they are attributed?

Réponse — The gypsum you refer to belongs to the Tripolitza Phyllites (Permo-Triassic) which directly overlie the Adriatic-ionian autochthonous of Crete with a tectonic contact. In my opinion the Tripolitza Phyllites belong to the Tripolitza Nappe. This Cretean gypsum of the Tripolitza sedimentation area is possibly an equivalent of the Adriatic-ionian gypsum of W. Greece. Thank you for your question. It led me to the idea that remains of this Cretean gypsum should exist and should be found on the Cyclades, possibly representing an " indicator stone " for the home area of the Cretean Tripolitza Nappe.

C. J. Mulder. — You remarked that Cyprus could be considered as geological continuation of the Eastern Mediterranean ridge. Offshore seismic work shows that the East Mediterranean Ridge passes south of Cyprus partly merging into non — or slightly disturbed Neogene basins. Also Central Cyprus (Troodos) represents a very marked gravity and magnetic high. No indication for any comparable anomaly exists for the Eastern Mediterranean Ridge.

Réponse. — That is right. In analogy to the east west extension of the Adriatic-ionian sedimentation area (400 km between W. Crete and Rhodes) and its eastern prolongation (probably south of SW Turkey) the sedimentation area, which existed between this east west part of the Adriatic-ionian sedimentation area and Africa during the Mesozoic to Paleogene, possibly stretched east west, too. In this case Cyprus could have been an eastern part of this Preneogene Eastern Mediterranean sedimentation area now destroyed by geodynamic movements. I am sorry that I cannot give evidence rather than the speculation above based on analogy.

H. Closs. — Does the result of your investigations mean, that the thrust movements of the nappes are much bigger than estimated up to now.

Réponse. — Yes. The distribution of the Adriatic-ionian sedimentation area during the Mesozoic reveals a thrust movement only for the Cretean Tripolitza Group (Permo-Triassic T. Phyllites,? Rhaeto-Liassic, Jurassic - M. Eocene T. Limestones and U. Eocene - ? L. Oligocene T. Flysch) over a distance of more than 100 km (distance from north coast to south coast of M. Crete already 60 km) from North to South within the South Aegean during Oligocene. A similar amount of thrust movement should be added in Peloponnesus, too, because of the allochthonous character of its Tripolitza Group west of the Parnon Mountains.

*
* *