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High sedimentation rates and thicknesses of the Neogene in the Circummediterranean area; application of results of the IGCP No. 25; part 4

JÁN SENEŠ

Geological Institute of the Centre of Geoscience Research, Slovak Academy of Sciences, Dúbravská cesta 9, 814 73 Bratislava

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Abstract

In the fourth part of his series of papers, the author makes us familiar with the high sedimentation rates of the Neogene in some regions of the Mediterranean Tethys and Paratethys. The obtained data are compared with the sedimentation rates of recent seas and oceans and the assumption is confirmed that a predominant part of the Neogene formations originated in geomorphologically varied areas, in a shallower, and not bathyal environment. The author points out the risks of direct application of the data in geodynamic interpretations, since sedimentation rates can be determined only on the basis of the now existing reduced thicknesses of formations. It is therefore considered necessary to evaluate in greater detail also the time and space migration of orogenic phases including the uplift of young mountain belts in the Circummediterranean area. Some more detailed information, together with the here presented brief outline of the sedimentation rates, would then allow a more precise analysis of the development of various Neogene subsidence regions on the whole intercontinental territory.

The enormous thicknesses of the Neogene discovered in the last half-century especially by means of deep boreholes are with right an inspiration to many geologists urging them to more modern paleogeographic and geodynamic considerations. The great thickness of the sediments is undisputably also a result of them being less affected by diagenetic processes than some older formations. The circumstance that they are relatively little dynamometamorphosed provides ideal opportunities for the study by all branches of geology and, above all, it allows more realistic geodynamic and palinspastic interpretations.

In one of my papers I have indicated the areas with high sedimentation rates in the Neogene of the Tethys and Paratethys region (Seneš, 1988), but without giving a more detailed specification of the time and space.

In my opinion more detailed data will provide the basis for the reconstruction of the mobility of many regions with great subsidences and uplifts. Thus it will contribute not only to increasing the accuracy of the time of origin and development of the Neogene basins, but it will also be a key to the determination of the intensity, time and space migration of epeirogenic and orogenic movements in the whole Circummediterranean Neogene.

Similarly as in the previous papers of this series, I use in this one the basic data from the Final Report of the IGCP Project No.25 (Seneš, 1985; Steininger et al., 1985) which provides a modern evaluation of the stratigraphy of the studied extensive intercontinental area.

The latest opinions on the correlation of regional chronostratigraphic units (stages) of the Neogene as well as the map of the geographic setting and numbering of the sedimentation basins can be found in the work of Seneš (1989). The basis for the absolute dating of stage boundaries have been data published by Berggren et al. (1985), Menning (1989), relatively corresponding to the radiometric dating of regional Paratethys stages (Vass and Čech, 1983; Nevesskaya, 1984; Vass et al., 1987; Semenenko, 1987). It is clear that we cannot exclude a certain margin of error in the data, which can by itself affect the accuracy of the calculation of sedimentation rates. This fact is in the following text indicated by the symbols ~ or ±. The presented sedimentation rates could have been originally substantionally higher since a significant part of the formations had in the studied time units either a delayed transgressive character, they frequently show angular discordances, or they were eroded in their terminal part. Only the existing thickness of the strata — representing mostly only a relic — is today measurable for the purpose of calculations. Equally important is the diagenetic thinning, above all of pelitic sediments, especially those older than 10—15 my, covered often by as much as several thousands of meters thick younger sediments of the Upper Miocene and Pliocene (Moore, 1962; Füchtbauer and Reineck, 1963). When measuring the thicknesses we should take into account also the existence of phenomena causing the absence of sedimentation in certain areas (Reineck, 1960). These factors which always multiply the original sediment thicknesses are necessary to include in the calculations and thus in the tables they are denoted by special symbols.

The lowest values of thicknesses still presented in the tables and maps depend on the lenght of the time range of the respective stage. In shorter time intervals I include only thicknesses over 200—300 m, in longer ones those over 600—1 000 m. (Since smaller thicknesses are not included, I would like to stress that the maps *do not have paleogeographic character.)*

Because of geochronologic equivalence of some short-lasting stages of the Paratethys with stages of the Mediterranean which have a wider time range (Burdigalian = Eggenburgian + Ottnangian + Karpatian, or in the relation of the Central and Eastern Paratethys, Badenian = Tarchanian + Tchokrakian + Karaganian + Konkian) I present mostly only data related to the longer stage. Data on the Sarmatian s. str. from the Central Paratethys and Sarmatian s. lato from the Eastern Paratethys are listed separately. If the thicknesses of regional Lower and Upper Pliocene stages are not marked separately in the cited Final Report of the Project, I give only their summary thicknesses and sedimentation rates.*

In the below-mentioned tables I list, except the identifying numbers and names of the sedimentation basins, also the abbreviations expressing the reasons for the necessary positive corrections of the thicknesses caused by diagenesis, angular discordances, transgressive character of sedimentation or denudation-produced hiatus; further there are the abbreviations of the lithologic development of the formations and of the character of the environment of their origin.

I shall use the following abbreviations:

DG — probable reduction of sediments by diagenesis
AD — angular discordance (possibility of hiatus)
TR — transgressive character with a possibility of delayed beginning of flooding and sedimentation within the chronostratigraphic unit (lack of sediments in the basal time span)
EH — erosion relief and hiatus on the top of a sedimentary cycle
PSE — Psephites (gravels, conglomerates, breccias)
PSA — Psammites (sands, sandstones)
PE — Pelites (silt, clay, marl, sandy clays and sandy marls)
LST — Limestones-dolomites (bioherms, marly and sandy limestones)
EV — Evaporites (sensu lato)
FL — Flysch
TB — Turbidites
VC — Volcanoclastics (tuffs, volcanobreccias and agglomerates)
M — marine
B — brackish
L — limnic
FT — fluvio-terrestrial

Sedimentation area: No., denomination, country (Authors see in Steininger—Seneš et al., 1985)			Thickness in m	Time in my	Sedimentation cm/1000y	Necessary correction (+ cm)	Lithology	Environment
1			2	3	4	5	6	7
AQUITANIAN (±23.6—21.8 my). Map 1 = late Egerian = Caucasian								
1			2	3	4	5	6	7
9e.	Ebro, Miranda—Trevino	E	1000	~1.8	55,6	DG	PSE, PSA	L, FT
14a.	Provence, Camarque, Golfe du Lion	F	300		16,7	DG, EH	PE, LST	M
17al,2.	Piemonte B.	I	500		27,8	DG	PE, TR	M
17d3.	Romagna Apennine	I	300		16,7	DG	PSA, FL	M
33d.	Extern. Ionian Zone	GR	300		16,7	DG, EH	PSE, PSA	M
37a.	Corfu,Lefkas	GR	300		16,7	DG, EH	PSA, LST	M
38al,2.	Grevena B.	GR	500		27,8	DG, EH	PSE, PSA, PE	M, FT
38b	Thessalia B.	GR	300		16,7	DG, EH	PSE, PSA	M, FT
58a.	Erzincan-Cayirli	TR	450		25,0	DG, TR	PSE, EV, LST	M
69a3.	Malatya-Gürün B.	TR	300		16,7	DG, TR	PSE, LST	M
72al,2,3.	Gaziantep-Adyiaman — Urfa	TR	300		16,7	DG, AD, TR	PSA, PE, LST	M
72b.	Burc-Kilis, Gaziant.	TR	400		22,2	DG, TR	PSE, LST	M

* For the calculation of sedimentation rates I would like to thank my colleague Anna Nitrianska.

	1		2	3	4	5	6	7
150a.	Mediterran Coast	SYR	300		16,7	DG, AD, TR	PSA, PE, LST	M
82a.	Nile Delta B.	ET	300		16,7	DG	PSA, PE	B, FT
83dl.	Libyan Plateau	ET	300		16,7	DG	PSA	M, B, FT
92a/94a.	Zone Mesorifain — Syncl. Post Nappe	MA	300		16,7	DG	PSE, PSA, PE	M
100b.	Nappes Telliennes	DZ	2000		111,1	DG	PSE, PSA, PE	M, FT
102g.	SE. Titteri	DZ	500		27,8	DG, AD, TR	PSA, PE	M
109.	Khoumire — Mogods	TN	400		22,2	DG	PE	M
111.	Cap Bone	TN	300		16,7	DG, EH	PSE, PSA, PE	M, FT
200a.	Subalpin. Molass., E.	D	1000		55,6	DG ?	PSA, PE, PSE	B, M
200b.	Subalp. Mol., W.	D	500		27,8	DG ?	PSA, PE	B, L
200b.	Allgäuer Molasse	A	1800		100,9	DG, EH	PSE, PSA, PE	L, FT
200c.	Subalp. Molasse	CH	500		27,8	DG ?	PSE	L, FT
201c.	Mittelländ. Mol.	CH	1000		55,6	DG ?	PSA	FT
202a,b.	Molasse Zone	A	300		16,7	DG, EH	PSA, PE, VC	M
203b,c.	Pouzdřany Unit, Ždanice-Subsiles.U.	CS	500		27,8	DG, TR, EH	PSA, PE	M
204a3/205c3,5.	East Carpathian Foredeep	PL	800		44,4	DG, EH	PSA, PE	M
204b.	Carpath. Flysh Z.	SU	300		16,7	DG	PSA, PE, FL	M
204c,d.	E. Carp. Flysh Z.	R	300		16,7	DG	FL	M
205d.	Subcarpath. Fored.	SU	1000		55,6	DG, EH	PSA, PE, EV	M
205e.	Subcarpath. Fored.	R	400		22,2	DG, EH	PSE, PSA, PE	M
206a.	Subcarp. Getic Depr.	R	300		16,7	DG	PSE, PSA	M, L
212.	S. Slovak Danub B.	CS	300		16,7	DG, EH	PSA, PE	M, B
213a,b.	S. Slovak Ipeľ, Rimava, Lucenec B.	CS	300	~1.8	16,7	DG, EH	PSA, LST	M, B
213c.	Börzsöny, Tokaj Mts.	H	300		16,7	DG	PSE, PSA, LST	M,B,L,FT
215.	East Slovakian B.	CS	300		16,7	DG, EH	PSA, PE	M
224al.	Drava B.	YU	500		27,8	DG	PSA, PE	L
224b.	Transtethyan Corr.	YU	400		22,2	DG, AH, TR, EH	PSA, PE	M
227a.	Tuzla B.	YU	400		22,2	DG, AD, TR	PSA, PE	L
232.	S. Moravian Nis B.	YU	500		27,8	DG, AD, TR	PSE, PSA, VC	L
137.	Dugi Otok B.	YU	300		16,7	DG, AD, TR	PE, LST	M
246.	Crimea	SU	400		22,2	DG	PSA, PE	M
247.	Kerch Peninsula	SU	1000		50,0	DG	PE	M
248.	Taman Peninsula	SU	300		16,7	DG	PE	M
249.	S. Ciscaucasia, W.	SU	500		27,8	DG	PE	M
252.	Upper Kura Depr.	SU	700		35,0	DG	PE	M
253.	Sevan, Shirak, Araks, Depr., Erevan Syncl.	SU	300		16,7	DG	PSE, PSA, PE	L, FT
254.	Natchitchevan Depr.	SU	450		22,5	DG	PE, LST	L
255.	S. Ciscaucasia, E.	SU	300		16,7	DG, EH	PE	M
256a,b.	Middle Kura Depr.	SU	1500		75,0	DG	PE	M
258.	Shemako-Kobistan	SU	300		16,7	DG	PSA, PE	M
259.	Low. Kura Depr.	SU	500		27,8	DG	PE	M
260.	Talysh	SU	300		16,7	DG	PE, VC	M
261.	Apsheron Throug	SU	300		16,7	DG	PSA, PE	M
264.	N. Ciscaucasia, E.	SU	300		16,7	DG	PSA, PE	M
276.	Caspian Lawland, E.	SU	700		35,0	DG, EH	PE	M
277.	Mangyshlak	SU	400		22,2	DG	PE	M, B
356.	Qum B.	IR	300		16,7	DG	PSA, LST, VC	M

The in the place enormously high values of sedimentation are an evidence of a considerable mobility of some mountain belts immediately before or even during this short period. The great thickness of limnic and fluvio-terrestrial sediments in the Ebro depression is undoubtedly related to the marked uplift of the Pyrenees, similarly the fast sedimentation of the Molasse Zone in the region of Central Alps in Switzerland, in Bavaria and Austria. The rapidly subsiding basins in the region of Tellian and Great Atlas show already a rapid sedimentation in marine environment (up to 100 cm). The considerable sedimentation in northern and eastern forefield of the Carpathians and in the Kura Depression in the area between the Great and Little Caucasus is also already of marine character.

BURDIGALIAN (±21,8 – 16,6 my). Map 2
= Eggenburgian + Ottnangian + Karpatian
= Sakaraulian + Kozachurian (+ early Tarchanian partim?)

1		2	3	4	5	6	7
5a	Valencia Platf.	E	500	~5,2	9,6	DG	PSA, LST	M
9a.	Ebro Depr.	E	500		9,6	DG, ?	PSE, PSA	FT
14a.	Provence, Camarque, Golfe du Lion	F	500		9,6	DG	PE	M
17a1, 2.	Piemont B.	I	500		9,6	DG ?	TB	M
17d2, 3.	Emilia, W. Apennine, Romagna Apennine	I	500		9,6	DG ?	PE, LST	M
24.	Calabria, Punta Stilo	I	500		9,6	DG	FL, PSA	M
32.	Umbria	I	500		9,6	DG ?	FL, PE	M
26b.	Sicily, Iblei Mts. E.	I	500		9,6	DG ?	LST, VC	M
22.	Sardinia, Campidano	I	500		9,6	DG ?	PE, LST, VC	M
33c.	Middle Ionian Zone	GR	1500		28,8	DG, TR, EH	PSA, PE	M
37d1.	Zakynthos	GR	500		9,6	DG	PE, LST	M
38a1, 2.	Grevena B.	GR	750		14,4	DG, TR, EH	PSE, PSA, PE	M, FT
38b.	Thessalia B.	GR	500		9,6	DG, AD, TR	PSA, PE, LST	M
50b, c.	N. Thrace B. Ergene. TR	TR	500		9,6	DG	PSA, PE, VC	L, FT
54.	Izmir, Urla	TR	500		9,6	DG	LST	L
58a.	Erzincan-Cayirli	TR	1000		19,2	DG, EH	PE, LST, EV	M
60d.	N. Simav	TR	500		9,6	DG, AD	PSE	FT
70b1, 2, 3.	Erzurum-Karayazi	TR	600		11,5	DG, TR, EH	LST	M
72a1, 2.	Gaziantep, Adyiaman, Urfa	TR	500		9,6	DG, EH	PSA, PE, LST	M
75a.	Tel. Aviv-El Arish	IL, ET	500		9,6	DG, EH	PE, LST	M
80a1.	N. Red Sea B.	ET	1200		23,1	DG, TR	PSA, PE	M
81a1, 5, 7.	Gulf Suez B.	ET	600		11,5	DG, TR	PSA, PE, LST	M
82a1, 3.	Nile Delta B.	ET	500		9,6	DG	PSA, PE	M, B
83d1.	Libyan Plateau	ET	500		9,6	DG	PSA, PE	FT
92a/94a.	Zones Mesorifain/Syncl. Post Nappe	MA	500		9,6	DG	PSA, PE, LST	M
99a/105d.	NE. Gr. Kabylie	DZ	500		9,6	DG, AD	PSE, PSA, PE	M
99b/105f.	Petit Kabylie	DZ	500		9,6	DG, AD	PSE, PSA, PE	M
102f, g.	S., SE. Titteri	DZ	500		9,6	DG, AD	PSA, PE	M
105c.	Dellys B.	DZ	500		9,6	DG, AD	PSE, PSA	M
200a.	Subalp. Molasse, E.	D	900		17,1	DG ?	PSA, PE	M, B
200b.	Subalp. Molasse, W.	D	2000		38,5	DG ?	PSE, PSA, PE	M, B
200b.	Allgauer Molasse	A	500		9,6	DG ?	PSE, PSA, PE	M,B
201c1.	Mitteländ. Molasse	CH	800		15,0	DG, AD	PSE, PSA	M, B
202a, b.	Molassezone	A	1000		19,2	DG, AD, EH	PSE, PSA, PE	M, B
203a.	Waschbergzone	A	500		9,6	DG, AD, TR, EH	PSA, PE	M
202c.	Molasse N. Donau	A	1900		36,5	DG, TR, EH	PSE, PSA, PE	M, B
205a, b.	Subcarp. Fored. S.	CS	1500		28,8	DG, TR, EH	PSE, PE	M, B
204a3/205c3,4,5.	East Carpath. Foredeep	PL	1500		28,8	DG, AD, TR, EH	PSE, PSA, EV	M, L
205e.	Subcarpath. Fored.	R	1900		36,5	DG, TR, AD	PSE, PSA, EV	M, FT
205f.	E. Subcarp. Fored.	R	500		9,6	DG, EH	PSE, PSA, EV	M, FT
206a.	S. Subcarp. Fored.	R	1500		28,8	DG, EH	PSE, PSA, EV	M, B, L, FT
208a.	Vienna B., N.	CS	3000		57,6	DG, TR, EH	PSE, PSA, PE	M, B
208b.	Vienna B., Centr.	A	1000		19,2	DG, AD, TR, EH	PSE, PSA, PE	M, B
209a.	Sopron Mt.	H	1000		19,2	DG, TR, EH	PSE, PSA	L, FT
211.	Megasyncl. Brezov	CS	850		16,3	DG, TR, EH	PSE, PSA, PE	M, B, L
213b.	S. Slovakian Rimava, Lučenec B.	CS	850		16,3	DG, TR, EH	PSE, PSA, PE	M, L, FT
213c.	Börzsöny, Tokaj Mts.	H	1100		21,1	DG, AD, TR, EH	PSA, PE, VC	M, B, L
215.	E. Slovakian B.	CS	2000		38,5	DG, TR, AD, EH	PSA, PE, EV	M, B, L
217a.	Transylvan B., N. NW.	R	2000		38,5	DG, EH	PSE, PSA	B
217b2, 3.	Transylv. B., S. SW.	R	500		9,6	DG, EH	PSE, PSA, VC	M, L, FT
217b4.	Transylvan B., E.	R	1200		23,1	DG, AD, TR, EH	PSE, PSA, PE	M
222.	Mecsek Mts.	H	1000		19,2	DG, AD, TR, EH	PSA, PE, VC	M, L, FT
224a.	Zala-Dráva B.	H	1000		19,2	DG, AD, TR, EH	PSA, PE, VC	M, L, FT
224a1.	Drava B.	YU	500		9,6	DG, EH	PE, LST	L ?
224b.	Transtethyan Corr.	YU	900		17,1	DG, AD, TR, EH	PSE, PSA, PE	M
224c.	Mura B.	YU	500		9,6	DG, AD, TR, EH	PSA, PE, VC	M, L, FT
56.	Dugi Otok B.	YU	600		11,5	DG	PSA, PE	M
247.	Kerch Peninsula	SU	1900		36,5	DG	PE	M
248.	Taman Peninsula	SU	2000		38,5	DG	PSA, PE	M, B
249.	S. Ciscaucas., W. SW.	SU	500		9,6	DG	PE	M, B
250.	S. Ciscaucas., Centr.	SU	600	~5,2	11,5	DG	PE	M

	1		2	3	4	5	6	7
255.	S. Ciscaucas., E.	SU	500		9,6	DG, TR	PE	M, B
251.	Rioni Depr.	SU	500		9,6	DG	PSA, PE	M, B
252.	Upp. Kura Depr.	SU	1000		19,2	DG	PSA, PE	M, B
256a,b.	Midd. Kura Depr.	SU	500		9,6	DG	PE	M
258/261.	Shemako-Kobistan Syncl., Apsheron Trough	SU	500		9,6	DG	PSA, PE	M, B
253.	Sevan, Shirak, Araks Depr., Erevan Syncl.	SU	500		9,6	DG	PSE, PSA, PE	L, FT
260.	Talysh	SU	1000		19,2	DG	PE	M, B
257.	Kussaro-Divichin	SU	500	~5,2	9,6	DG	PSA, PE	M, B
264.	N. Ciscaucasia, E.	SU	800		15,0	DG, EH	PSA, PE	M, B
359/361.	Zagros B.	IR	1000		19,2	DG	PSA, LST, EV	M
356.	Qum B.	IR	1000		19,2	DG	PE, LST	M
358.	Centr. Albourz B.	IR	500		9,6	DG	PSA, EV	M
362.	Baluchistan B.	PA	500		9,6	DG	PSA, PE	M
363.	Lower Indus B.	PA	500		9,6	DG, EH	PSA, LST	M
364.	Upper Indus B.	PA	2000		38,5	DG	PSA, PE	FT

In the relatively large range of the *Burdigalian*, no exceptionally rapid accumulation of sediments of aquatic or continental origin could be observed according to our data, neither in the Mediterranean, nor in the Paratethys region. This circumstance could be an evidence of a gradual wanning of the uplift of mountain belts as well as of the stagnation of greater subsidences. However, it is noteworthy that in the Mediterranean and Eastern Paratethys region the sedimentation of arenaceous and pelitic formations prevails almost during the whole time range, while in the Central and Western Paratethys region, especially in the beginning of this time (Eggenburgian) coarser clastic sediments are predominant and pelitic sedimentation occurs only in its second half (Ottnangian and Karpatian) in an ondobtedly calmer environment. In the Central Paratethys, in the terminal phase of the Burdigalian (Karpatian) a considerable subsidence affected some intramontane basins of the Carpathian region, leading to enormous marine pelitic sedimentation. It attained in the Vienna Basin and some other marginal Intracarpathian depressions the rates of as much as 150—250 cm/1 000 y.

KARPATIAN (± 17,4 — 16,6 my). Map. 3
= upper late Burdigalian
= late Kozachurian (± early Tarkhanian partim?)

	1		2	3	4	5	6	7
202c.	Molassezone N.	A	500		62,0	AD, TR, EH, DG	PSE, PSA, PE	M
205a.	Subcarp. Fored. S.	CS	1200		150,0	DG, AD, EH	PE	M
205b.	Subcarp. Fored. N.	CS	300		37,5	DG, AD, TR, EH·	PSA, PE	M
203c.	Ždanice-Subsilesia	CS	200		25,0	DG, AD, TR, EH	PE	M
204a1/205c1.	Upp. Silesia	PL	350		43,7	DG, AD, TR, EH	PSE, PE	M
204a3/205c3, 5.	E. Carp. Fd.	PL	1000		125,0	DG, EH	PSA	M
? 205d.	Subcarpath. Fored.	SU	500		62,0	DG, EH	PSE, PSA, EV	M?
205e.	Subcarpath. Fored.	R	1000		125,0	DG, EH	PSA, EV	M
205f, g.	Subcarpath. Fored.	R	300		37,5	DG	PSA, PE, EV	M
204c, d.	E. Carpath. Flysh	R	300		37,5	DG, AD, TR	PSE, PSA, PE, EV	M
206a.	S. Subcarpath. Fd.	R	800		100,0	DG, TR	PSE, PSA	L, FT
208a1.	Vienna B., N.	CS	2300		287,5	DG, TR, EH	PSE, PE	M
208a2.	Vienna B., N.	A	500	~ 0,8	62,0	AD, TR, EH, DG	PSA, PE, VC	M
208b.	Vienna B., Centr.	A	1300		162,5	DG, AD, EH	PSE, PSA, PE	M
209a.	Sopron Mt.	H	400		50,0	DG, AD	PSE, PSA	L, FT
211.	Megasyncl. Brezov	CS	500		62,0	DG, EH	PSA, PE, VC	M
213a, b.	S. Slovakian Ipel, Rimava, Lucenec B.	CS	200		25,0	DG, EH	PSA, PE	M
213c.	N. Hungary, Börzsöny, Tokaj Mts.	H	800		100,0	DG, AD, TR, EH	PSE, PSA	M
215.	East Slovakian B.	CS	1600		200,0	DG, TR, EH	PSE, PSA, PE, EV	M
217a.	Transylvan. B., N.	R	500		62,0	DG	PSE, PE	B
230a.	Danubian Corridor	YU	200		25,0	DG, AD	PSE, PE	L
223a, b, c.	Bačka-Banat B.	YU	200		25,0	DG, AD, TR, EH	PSE, PSA, VC	L, FT

	1		2	3	4	5	6	7
222.	Mecsek Mt.	H	600		75,0	DG, AD, TR	PSE, PSA	M
219c.	Transdanubia SE.	H	300		37,5	DG	PSA, PE, VC	M
221a1.	Steirisches B., W.	A	500		62,0	DG, EH	PSE, PSA, VC	L
221a2.	Steirisches B., E.	A	200		25,0	DG, AD, TR, EH	PSE, PE, VC	M
224b2.	Transtethyan Trench.	YU	200	~0,8	25,0	DG, AD, TR, EH	PSA, PE	M
224c.	Mura B.	YU	200		25,0	DG, TR, EH	PSA, VC	M
226.	Sava B.	YU	200		25,0	DG, EH	PSA, PE	M
227a.	Tuzla B.	YU	200		25,0	DG, ?	PSE, LST, VC	L
137.	Dugi Otok B.	YU	300		37,5	DG	PE	M

LANGHIAN (± 16,6 — 15,0 my). Map 4
= early Badenian
= Tarchanian (partim?) + Tchokrakian (partim?)

	1		2	3	4	5	6	7
14a.	Camarque, Golf du Lion, Provence	F	300		18,8	DG	PSA, PE	M
17a1, 2.	Piemont B., Centr.	I	500		31,3	DG ?	PE, TB	M
17d1, 3.	Salsomaggiore, Romagna Apennine	I	300		18,8	DG ?	PSA, PE	M
27b.	Sicily, Madonie-Nebrodi	I	300		18,8	AD ?, DG	PE	M
42a.	SW. Akarnania B.	GR	300		18,8	DG	PSE, PSA, PE	M
80a1.	N. Red Sea B.	ET	500		31,3	DG	PE, EV	M
81a2, 3, 7.	Gulf Suez B.	ET	500	~ 1,6	31,3	DG	PE, EV	M
99a/105d.	NE. Gr. Kabylie	DZ	300		18,8	DG	PSA, PE	M
102f.	S. Titteri	DZ	500		31,3	DG, EH?	PE	M
106b.	Plateau St. Louis	DZ	500		31,3	DG, AD, TR	PE, EV, VC	B
106f.	Bord S. Dahra	DZ	300		18,8	DG, AD	PSE, PSA	FT
106h.	NW. Ouarsenis	DZ	1000		62,5	DG	PSE, PSA, PE	M
107a.	Moyen Cheliff	DZ	1000		62,5	DG, AD	PSE, PSA, EV	M, FT

SERRAVALLIAN (± 15,0 — 11,3 my). Map 4
= middle-late Badenian + Sarmatian s. str. + lowermost early Pannonian (e. Malvensian)
= Karaganian + Konkian + Volhynian + early Bessarabian

	1		2	3	4	5	6	7
1c.	Betic Ranges	E	500		13,5	?	PSE, LST, EV	M
5a, b.	Valencia Platf.	E	500		13,5	?	PE	M
15a.	Moyen Vallée Rhône	F	500		13,5	DG	PSA	M
17d3.	Romagna Apennine	I	500		13,5	—	PSA, PE	M
27b.	Sicily, Madoni-Nebrodi	I	1000		27,0	—	PE	M
33d.	External Ionian Zone	GR	500		13,5	—	PSE, PE	M
42a.	SW. Akarnania B.	GR	500		13,5	—	PSE, PSA, PE	M
46c.	Crete, Iraklion	GR	550	~3,7	14,9	DG, TR	PSE, PSA, PE	L, FT
49a.	Kithera, N. Mesaoria	CY	500		13,5	—	PE	M
81a5, 7.	Gulf Suez B.	ET	300		8,1	DG	PE, EV	M
102a/104a.	M'Sirda	DZ	600		16,2	DG, AD, EH	PSE, PSA, PE	M
102d.	S. Beni Chougrane	DZ	500		13,5	DG, EH	PE	M
106f.	Bord S. Dahra	DZ	1000		27,0	DG, AD	PSA, PE, EV	B, M
106i.	Oued Allalia	DZ	500		13,5	—	PE	M

BADENIAN(± 16,6 — 13,8 my). Map. 5
= Tarchanian + Tchokrakian + Karaganian + Konkian (see areas No 225—260)
= Langhian + early Serravallian

	1		2	3	4	5	6	7
200b.	Subalp. Molasse, W.	D	1000		35,7	DG, EH	PSE, PSA	L, FT
205a.	Subcarp. Fored., S.	CS	700		25,0	DG, AD, TR	PSE, PSA, PE	M
205b.	Subcarp. Fored., N.	CS	1300		46,4	EH, AD, TR, DG	PSA, PSE, PE, EV	M
204a1/205c1.	Upp. Silesia	PL	1000	~2,8	35,7	DG, AD, TR, EH	PSE, PSA, PE, EV	M
204a3/205c3, 5.	East. Carpath. Fored.	PL	1600		57,1	DG, AD, TR	PSA, PE, EV	M
205d.	Subcarp. Fored.	SU	1000		35,7	DG, AD, TR, EH	PSA, PE, EV, VC	M
208a.	Vienna, B., N.	CS	1700		60,7	DG, AD, TR, EH	PSE, PE, PSA, LST	M

	1		2	3	4	5	6	7
208b.	Vienna B., Centr.	A	800		28,6	DG, AD, TR, EH	PSA, PE, LST	M
208c.	Vienna B., S.	A	800		28,6	DG, AD, TR, EH	PSE, PSA, PE, LST	M
210b.	S. Slovak. Danub B. W.	CS	900		32,1	DG, AD, TR, EH	PSE, PSA, PE	M
210a.	S. Slovak. Danub B. Centr.	CS	2000		71,4	EH, DG, AD, TR	PSE, PSA, PE, VC	M, FT
212.	S. Slovak. Danub B., E.	CS	2300		82,1	DG, AD, TR, EH	PSA, PE, VC	M, FT
209c.	W. Hungarian B.	H	800		28,6	DG, AD, TR	PSE, PSA, PE	M
213a.	S. Slovak Ipel B.	CS	700		25,0	DG, AD, TR	PSA, LST, VC	M, FT
213c.	N. Hungary, Börzsöny, Tokaj Mts.	H	2100		75,0	DG, AD, TR, EH	PSA, PE, LST, VC	M, FT
215.	E. Slovak. B.	CS	3500		125,0	DG, AD, TR, EH	PSA, PE, EV, VC	M, B
216a.	Zakarpatia B.	SU	3000		107,0	DG, AD, TR	PSA, PE, EV, VC	M, FT
216b.	Maramures B.	R	1000		35,7	DG, AD, TR	PE, EV, VC	M
217a.	Transylvan. B., N., NW.	R	1000		35,7	DG, AD, TR	PE, EV, VC	M
217b1, 2, 217c, d.	Transylvan. B., WSW., S., SW.	R	500	~ 2,8	17,9	DG, AD, TR	PE, EV, VC	M
217b3.	Transylvan. B., SE.	R	1500		53,6	DG, AD, TR	PE, EV, VC	M
217b4.	Transylvan. B., E.	R	1400		50,0	DG, AD, TR	PE, EV, VC	M
230c.	Danubian Corridor	R	1000		35,7	DG, AD, TR	PSE, PSA, VC	M, L. FT
223c.	Banat B., S.	YU	500		17,9	DG, AD, TR	PSA, PE, LST	M
221a1, 2.	Steirisches B.	A	700		25,0	DG, AD, TR, EH	PSE, PSA, PE, LST	M
224a1.	Drava B.	YU	1200		42.9	DG, AD, TR, EH	PSE, PSA, PE, LST	M
226.	Sava B.	YU	1100		39,3	DG, AD, TR, EH	PE, LST	M
227a.	Tuzla B.	YU	1000		35,7	DG	PSA	M
255.	South Ciscaucasus, E.	SU	1000		35,7	DG, AD, TR	PSA, PE	M, B
257.	Kussaro-Divichin	SU	800		28,6	DG, AD	PSA, PE	M, B
258.	Shemako-Kobistan	SU	900		32,1	DG	PSA, PE	M, B
253.	Sevan, Shirak, Araks Depr., Erevan Syncl.	SU	2100		75,0	DG	PSE, PSA, PE EV, PSE, PSA, PE	B, FT
254.	Nachitchevan Depr.	SU	900		32,1	DG, TR, AD, EH	PSA, PE, EV	M, B
260.	Talysh	SU	1000		35,7	DG	PSA, PE	M, B

In the *Langhian* and *Serravallian*, more rapid marine and in place fluvio-terrestrial sedimentation can be observed in the Mediterranean region only north of the Atlas Telliene, exceeding here 50 cm/1 000 y. In the same time interval, but on the territory of Paratethys (the whole Badenian and Sarmatian s. str.), the high sedimentation rates known from the Karpatian continue to occur (see below).

Badenian — Sarmatian: In spite of the fact that the time range of the Badenian and Sarmatian in the Central Paratethys corresponds only to the Mediterranean stages of Langhian and Early — lower Late Serravallian, it displays considerably higher sedimentation rates. The thickness of the predominantly marine sediments attains, especially in the Intracarpathian depression and in the basins of the Caucasian region, up to 2 000—3 500 m. In these rapidly subsiding areas the sedimentation rates exceeded 70—130 cm/1 000 y.

During *Sarmatian* s. str. (Middle and lower Late Serravallian), the sedimentation attained in the foredeep of the Eastern Carpathians up to 200 cm per 1 000 y and in many Intracarpathian regions it varies minimally between 50 and 100 cm/1 000 y. Similar high values of sedimentation can be observed in the same time in the Eastern Paratethys region, in basins south of Great Caucasus.

SARMATIAN s. str. (±13,8 – 11,8 my). Map 6
= middle + lower late Serravallian
= Volhynian + early Bessarabian

	1		2	3	4	5	6	7
208a.	Vienna B., N.	CS	700		35,0	TR, EH	PSA, PE, LST	B
208b, c.	Vienna B., Centr., S.	A	500		25,0	AD, TR	PSA, PE, LST	B
221a 2.	Steirisches B., E.	A	1000		50,0	AD, TR, EH	PSE, PSA, PE	B, L
210b.	S. Slovak. Danub B., W.	CS	600		30,0	TR, EH	PSA, PE	B
211.	Megasyncl. Brezov	CS	700		35,0	TR, EH	PSA, PE, VC	L, FT
215.	E. Slovak. B.	CS	2200		110,0	AD, TR, EH	PSA, PE, VC	B, L
216a.	Zakarpatia B.	SU	1200	~ 2,0	60,0	AD, TR, EH	PSE, PE, VC	B, FT
216b.	Maramures B.	R	600		30,0	EH	PSA, PE	B
213c.	N. Hungary, Börzsöny, Tokaj Mts.	H	1600		80,0	AD, TR, EH	VC, PSE, PSA, LST	B, FT
220.	Great Plain B.	H	500		25,0	AD, TR	PSE, PSA, PE, LST, VC	B, FT

1			2	3	4	5	6	7
217b1.	Transylvan. B., W., SW.	R	1000		50,0	EH	PSA, PE, VC	B
217b2.	Transylvan. B., S.	R	1300		65,0	AD, TR, EH	PSA, VC	B
217b3.	Transylvan. B., SE.	R	1000		50,0	—	PSA, PE	B
217b4.	Transylvan B., E.	R	600		30,0	—	PSA, PE	B
223c.	Banat B., S.	YU	700	~2,0	35,0	—	PSA, PE	B
229b.	Morava B.	YU	600		30,0	TR	PSA, PE, LST	B
204a3/205c3,5.	E. Carpath. Fored.	PL	2000		100,0	TR, EH	PSA, PE	B
205d.	Subcarpath. Fored.	SU	4000		200,0	AD, TR, EH	PSA, PE	B
206b1.	S. Subcarp. Fored.	YU, R	900		45,0	EH	PSA, PE, LST	B

VOLHYNIAN + BESSARABIAN + CHERSONIAN (SARMATIAN s. lato ± 13,8 — 9,6 my). Map. 6
= Sarmatian s. str. + late Bessarabian + early-middle Pannonian
= middle-late Serravallian + early-lower middle Tortonian

1			2	3	4	5	6	7
240a-f.	Dobrodgea, Balcik, Varna Area	R, BU	200		4,8	AD, TR, EH	PSA, PE, LST	B
247.	Kerch Peninsula	SU	750		17,9	—	PE, LST	B
249.	South Ciscaucas., W.	SU	600		14,3	EH	PSA, PE, LST	B
250.	S. Ciscaucas., Centr.	SU	600		14,3	EH	PSA, PE, LST	B
255.	S. Ciscaucasia, E.	SU	1 150	~4,2	27,4	EH	PSA, PE	B, FT
251.	Rioni Depr.	SU	2 100		50,0	EH	PSE, PSA, PE	B
252.	Upper Kura Depr.	SU	3 300		78,6	EH	PSA, PE, LST	B
256a.	Midd. Kura Depr., W.	SU	1 350		32,1	EH	PSA, PE	B
258.	Shemako-Kobistan	SU	700		16,7	EH	PSA, PE	B
253.	Sevan, Shirak, Araks Depr., Erevan Syncl.	SU	1 000		23,8	EH	PSA, PE, LST	B, FT
254.	Nachitchevan Depr.	SU	900		21,4	AD, TR, EH	PSA, PE, EV	B

TORTONIAN (± 11,3 — 6,4 my). Map. 7
= upper early-late Pannonian + early-middle Pontian
= late Bessarabian + Chersonian + Maeotian + early-middle Pontian

1			2	3	4	5	6	7
2b4.	Granada B., NE., SE.	E	500		10,2	AD, TR	PSA, PSE	M
3b1, 2, 3.	Betic Ranges, Almerian Corridor	E	400		8,2	AD, TR	PSA, PSE, PE, TB	M
6a, b.	Valles — Penedes	E	700		14,3	—	PSE, PSA	FT
17c.	Veneto — Friuli	I	1000		20,4	—	PSE, PSA	M, L
17d2.	Emilia, W. Apennine	I	400		8,2	EH	PSA, PE	M
20a.	Corsica, Plain E.	F	500		10,2	AD, TR	PE	M
22.	Sardinia, Campidano	I	300		6,1	—	PE, LST	M
25.	Sicily, Caltanisetta	I	900		18,4	AD, TR	PSE, PSA, PE	M
27b.	Sicily, Madonie — Nebrodi Mts.	I	400		8,2	AD, TR	PSE, PSA, PE	M
27d.	Sicily, Castelvetrano	I	1500	~4,9	30,6	EH	PSA, PSE, LST	M
30b.	Intra Apenn. B., Molise	I	500		10,2	?	TB	M
37dl.	Zakynthos	GR	700		14,3	—	PE	M
46c.	Crete, Iraklion	GR	300		6,1	EH	PSE, PSA, PE	M, B
49a	Kithera, N. Mesaoria	GR	300		6,1	?	PSA, PE	M
52b1.	Carsamba-Bafra	TR	1000		20,4	AD, TR, EH	PSE, PSA, VC	M
62c2.	SW Anatolia, Stand.	TR	300		6,1	AD	PSE, PSA, VC	L, FT
69a3.	Malatya-Gürün B.	TR	600		12,2	AD	PSE, PSA, VC	L, FT
70a.	Hinis B.	TR	500		10,2	AD, TR	PSE, PE, EV, VC	FT
151.	Mesopotamian B.	SYR	700		14,3	—	PE, LST, EV	B
81a3, 8, b2.	Gulf Suez B.	ET	1000		20,4	EH	PSA, PE, LST, EV	M
92a/94a.	Zones Mesorifaines, Post nappe	MA	1000		20,4	AD, TR	PSA, PSE, PE	M, FT
92b/94a.	Prerif Interne/Syncl., Post Nappe	MA	1000		20,4	AD, TR	PSE, PSA, PE	M, FT
95a.	Gharb, (Centr.)	MA	500		10,2	AD, TR	PE	M
96b.	Guercif, S.	MA	2600		53,1	AD, TR	PSE, PSA, PE	M, FT
103b.	Hodna B., E.	DZ	1500		30,6	AD, TR	PSE, PSA, PE	M, B
106b.	Plateau St. Louis	DZ	1000		20,4	AD, TR	PE	M
106f.	Bord. Dahra, S.	DZ	550		11,2	?	PE, EV	M, B
106g.	Bas-Cheliff	DZ	1000		20,4	?	PSA, PE, VC	M
110.	Bizerte	TN	2800		57,1	AD, TR	PSA, PE, EV	M, B, L

The *Tortonian* has thicknesses of over thousand meters, except in northern Italy, mostly only in the southern regions of the Mediterranean area, above all in the basins and nappes of Atlas and Tunesia. The maximum, with sedimentation rates of almost 60 cm/1 000 y, lies in the region of Bizerte. The equivalent, as far as their age is concerned, and decreasingly saline sediments of the Paratethys show similar sedimentation rates of the Pannonian and Pontian time only in places.

If we assume the duration of the *Pannonian (Malvensian)* to be roughly 3 million years, we can consider the sedimentation in brackish-freshwater lakes of that time to be geodynamically corresponding probably only to a period of low activity. It is comparable also with the sedimentation of recent extensive brackish seas and lakes (approx. 10—20 cm/1000 y.). Except the Eastern Carpathian foredeep, the sedimentation value exceeds 30 cm only in marginal Intracarpathian depressions; in the central part of the South Slovakian Danube Basin it is over 50 cm/1 000 y. These positive anomalies indicate a shift of tectonic mobility within the Central Paratethys. Gradual subsidence of central Intracarpathian and Intradinarid regions as well as of the frontal regions of the Eastern Carpathians started already in the Sarmatian. However, flooding of the Western Carpathians and of the Alpine foredeep already did not take place.

The sedimentation rates of the Upper Bessarabian, Chersonian and Maeotian in the Eastern Paratethys have similar values as those of the Central Paratethys, the maximal occurring still in the Rioni and Upper Kura Depression. In the short time of the Maeotian itself (0.8 my) the sedimentation rate in the Rioni Depression attained at least 160 cm/1 000 y.

PANNONIAN (= MALVENSIAN) (±11,8 – 8,8 my). Map 8
= upper late Serravallian + early-middle Tortonian
= late Bessarabian + Chersonian + Maeotian

	1		2	3	4	5	6	7
208a.	Vienna B., N.	CS	550		18,3	AD, TR	PSA, PE	B
208b, c.	Vienna B., Ce., S.	A	600		20,0	AD, TR	PSA, PE	B
209c.	W. Hungarian B.	H	300		10,0	—	PSA, PE, VC	B
210a.	S. Slovak. Danube B. Central	CS	1600		53,3	AD, TR	PSA, PE	B
210b.	S. Slov. Danub B., W.	CS	1000		33,3	AD, TR	PSA, PE	B
212.	S. Slovak Danub B., E.	CS	900		30,0	AD, TR	PSA, PE	B
214.	Centr. and S. Slovak Freshwater Bs.	CS	600		20,0	EH	PSE, PSA, PE, LST	L
215.	E. Slovakian B.	CS	400		13,3	AD, TR	PSA, PE, VC	L
216b.	Maramures B.	R	500		16,7	AD, TR	PE, VC	B, FT
205f, g.	Subcarpath. Fored.	R	1000		33,3	AD, TR	PSE, PSA, PE, LST	B, L, FT
206a, b.	S. Subcarp. Fd., W., S.	R	600		20,0	AD, TR	PSA, PE	B
217b1, 2.	Transylvan B., W., SW., S.	R	900	~ 3,0	30,0	AD, TR, EH	PSA, PE, VC	B
217b4.	Transylvan B., E.	R	700		23,3	EH	PSE, PSA, PE	B, FT
220.	Great Plain B.	H	700		23,3	—	PSA, PE	B, L
218a1.	Banat B.	R	300		10,0	AD, TR	PSE, PSA, PE	B
223c.	S. Banat B.	YU	300		10,0	—	PSA, PE, LST	B
224a.	Zala-Dráva B.	YU	500		16,7	—	PSA, PE	B, L
224a1.	Drava B.	YU	900		30,0	AD, TR	PSA, PE, LST	B, L
224b1.	Transtethyan Corr.	YU	500		16,7	AD, TR	PE	B
224c.	Mura B.	YU	500		16,7	AD, TR	PSA, PE	B
226.	Sava B.	YU	1000		33,3	AD, TR	PSA, PE, LST	B, L
233a.	W. Moravian B.	YU	500		16,7	—	PSA, PE	B, L
234a.	Sarajevo B.	YU	700		23,3	—	PSE, PSA	L, FT
236a.	Blagovgrad Graben	BG	700		23,3	AD, TR, EH	PSE, PSA	FT
239.	E. European Platf., Birland Depr.	R	500		16,7	—	PSE, PSA, VC	B, FT

PONTIAN (±8,8 – 5,8 my). Map 9
= middle-late Tortonian + early Messinian
= Pontian (of the Eastern Paratethys)

	1		2	3	4	5	6	7
210a.	S. Slovakian Danub Basin, Centr.	CS	2000		66,7	—	PSA, PE	B, L
212.	S. Slovak. Danub B., E.	CS	600		20,0	—	PSA, PE	L
215.	East Slovakian B.	CS	600		20,0	AD, TR, EH	PSE, PSA, PE	L
216a.	Zakarpatia B.	SU	300	~3,0	10,0	?	PSA, PSE, PE	B, FT
220.	Great Plain B.	H	800		26,7	—	PSA, PE	B, L
218a1.	Banat	R	300		10,0		PSE, PSA	L, FT
223a.	Bačka B.	YU	1000		33,3	—	PSA, PE	B,L

1			2	3	4	5	6	7
223b.	Banat B., N.	YU	2000		66,7	—	PSA, PE	B
223c.	Banat B., S.	YU	1500		50,0	—	PSA, PE	B
225.	Slavonia-Syrmian B.	YU	800		26,7	—	PSA, PE	B, L
226.	Sava B.	YU	2000		66,7	AD, TR	PSA, PE	B
227.	Tuzla B.	YU	1000		33,3	—	PSA, PE	B, L
224a1.	Drava B.	·YU	2500		83,3	EH	PSA, PE	B, L
224a.	Zala-Dráva B.	H	500		16,7	—	PE	B, L
224b1.	Transtethyan Corr.	YU	500		16,7	—	PSA, PE	B, L
209c.	W. Hungarian B.	H	300		10,0	—	PE	L
229b.	Morava B.	YU	1000		33,3	EH	PSA, PE	B, L, FT
233a.	W. Moravian B.	YU	700		23,3	EH	PSA, PE	L, FT
34.	Kosovo-Methohia B.	YU	300		10,0	—	PSA, PE	L
235a.	Sofia B.	BG	300		10,0	AD, TR	PE	L
205f.	Subcarpath. Fored., Bistriţa-Buzau	R	1200	~ 3,0	40,0	—	PSA, PE, LST	B, L
205g.	Subcarpath. Fored. Dimboviţa-Buzau	R	600		20,0	—	PSA, PE	B, L
206a.	Getic Depr., Dimb.	R	500		16,7	—	PSA, PE	B, L
248.	Taman Peninsula	SU	300		10,0	—	PE, LST	B
249.	S. Ciscaucasia, W.	SU	800		26,7	AD, TR	PSA, PE, LST	B, L, FT
251.	Rioni Depr.	SU	1350		45,0	AD, TR	PSA, PE	B
252.	Upper Kura Depr.	SU	1000		33,3	—	PSE, PSA, PE	FT
258.	Shemako-Kobistan	SU	400		13,3	AD, TR ?	PSE, PSA, LST	B
253.	Sevan, Shirak, Araks Depr., Erevan Syncl.	SU	500		16,7	—	PSA, VC	L, FT
280b.	W. Turkmenistan	SU	600		20,0	AD, TR, EH	PSA, PE	B

The paleogeografpic distribution of the sedimentation areas is in Paratethys similar as in the Pannonian, however, the subsidences in the southern Intracarpathian and Intradinarid basins were accelerated (the Sava Basin over 60, the Drava Basin over 80 cm/1 000 y). Since the terminal part of the Pontian corresponds at least to a part of the Messinian, we consider the general outline of the paleogeographic relations, including those of evaporite Mediterranean showing a tendency of subsidence of the decreasingly saline Paratethys in the Pontian correct.

The sedimentation in marine and evaporit development attains in the Guadalquivir Depression at least 360 cm/1 000 y, in non-marine development in the region of Gharb in Marocco 200 cm. Both regions are nevertheless paleogeographically situated rather in the Atlantic sphere that in the Mediterranean. A 150 cm sedimentation rate appears in the Denizli region of Southwestern Anatolia, however, the sediments are of limnic and fluvio-terrestrial origin. Average thickness in a typical hypersaline development in the Messinian is about 500 m, indicating with regard to the short duration of the stage a substantial subsidence, with undoubtedly considerable contribution of sediments from the Alps, Atlas and Taurids. As far as the 300—350 m thick limnic sediments of Mesopotamia — classified as Messinian — are concerned, it is probable that paleogeographically and facially they belong rather to a "pontian-facies" of Paratethys.

MESSINIAN (±6,4—5,4 my). Map 10
= late Pontian + early Dacian
= late Pontian + early Kimmerian

1			2	3	4	5	6	7
1a.	Guadalquivir D.	E	3600		360,0	AD	PSA, PE, EV	M
3b.	Betic Ranges	E	300		30,0	?	PSA, PE, LST, EV	M
5b.	Valencia Platf.	E	300		30,0	?	PE, EV	M, B
8.	Iberic Depr.	E	300		30,0	—	PE, LST, EV	M, B ?
17b.	Po B.	I	500		50,0	AD	PSE, PSA	FT
17c.	Veneto-Friuli	I	900		90,0	EH	PSE, PSA, PE	B
17d3.	Romagna Apennine	I	300	~1,0	30,0	EH	PSA, PE, EV	B, M
20a.	Corsica	F	500		50,0	EH	PSE, PSA, PE	M
18a1.	Val d'Elsa B.	I	300		30,0	AD,EH	PSE, PSA	FT, L
18b.	Volterra B.	I	400		40,0	EH	PSA, PE, EV	M, L
23.	Calabria, Crotone	I	450		45,0	EH	PSE, EV	M, FT
25.	Sicily, Caltanisetta B.	I	1500		150,0	—	PSE, LST, EV	M, FT
33d.	Extern Ionian Zone	GR	500		50,0	AD	PSE, PSA	M
37a.	Corfu	GR	500		50,0	EH	PSE, PE	M, B

	1		2	3	4	5	6	7
46a.	Crete, Khania	GR	400		40,0	AD	PSE, LST, EV	M, FT
49b.	Dhali, Mesoaria	CY	300		30,0	EH	PSE, PSA, EV	M
58c	Erzurum-Pasinler	TR	350		35,0	VC	VC	FT
64d.	Denizli	TR	1500		150,0	AD, EH	PSE, PSA	L, FT
69a3.	Malatya — Gürün B.	TR	800		80,0	—	VC	FT
70a.	Hinis B.	TR	400		40,0	—	PSE, PSA, VC	FT
75a.	Tel Aviv B.	IL	300		30,0	AD, EH	PSE, PE, EV	M, FT
82a2.	Nile Delta B.	ET	600	~1,0	60,0	—	PSE, PSA, PE	M, B, FT
92a/94a.	Mesorifain	MA	600		60,0	AD, EH, TR	PSE, PSA, PE	M, FT
92b/94a.	Prerif interne	MA	600		60,0	AD, TR, EH	PSA, PE	M
92c.	Prerif externe	MA	250		25,0	EH	PSA, PE	M
94a.	Syncl. intern p. n.	MA	600		60,0	EH	PSE, PSA, PE	M, FT
95a.	Gharb. (Centr.)	MA	2000		200,0	—	PSA, PE	M
95c.	Detroit Sud Rifain	MA	400		40,0	EH	PSE, PE	M
97a/93a.	Melilia-Kebdana	MA	500		50,0	AD, TR, EH	PSA, PE, LST, VC	M, L
97c.	Boudinar	MA	400		40,0	TR	PSE, PSA, PE, VC	M
104f.	Dahra	DZ	400		40,0	AD, TR, EH	PE, EV	M
106b.	Plateau St. Louis	DZ	500		50,0	EH	PSA, PE, LST, EV	M, B
106g.	Bas-Cheliff (Axial)	DZ	800		80,0	—	PE, EV	M, B
110.	Bizerte	TN	600		60,0	EH	PSA, PE, EV	M, L
111.	Cap Bon	TN	400		40,0	EH	PSE, PSA, PE, EV	M
112.	Sahel	TN	500		50,0	—	PSA, PE, EV	M, FT
151.	Mesopotamian B.	SYR	350		35,0	—	PSA, PE	L
353.	Mesopotamian B.	IRQ	300		30,0	EH	PSA, PE	L

ZANCLEAN (±5,4—3,4 my). Map 11
= ± Dacian (±5,8—3,6 my).
= ± Kimmerian (±5,8—3,4 my).

	1		2	3	4	5	6	7
2b.	Betic Ranges	E	1000		50,0	TR, EH	PSA, PE, EV	L, FT
20a.	Corsica, E.	F	1000		50,0	TR, EH	PE	M,B
18a3.	Radicofani B.	I	1500		75,0	AD,TR,EH	PSE, PSA, PE, EV	M
28.	Marches, Abruzzes B.	I	500		25,0	TR, EH	PSA, PE	M
27c.	Sicily, Sicani-Trapan.	I	750	~2,0	37,5	AD, TR, EH	PE, TB	M
60b,d.	Gediz, N. Simav	TR	300		15,0	AD, TR	PSE, PSA, PE	L
64c2.	SW. Anatolia	TR	400		20,0	?	PSE, LST	L, FT
96b.	Guercif S.	MA	900		45,0	?	PSE, PSA, LST	L, FT
106d,g.	Bas Cheliff	DZ	1000		50,0	TR, EH	PSA, PE	M
251.	Rioni Depr.	SU	500		20,8	?	PSE, PSA	B
257.	Kussaro-Divichin	SU	2500	~2,4	104,2	EH	PSE, PSA, PE	L
258.	Shemako-Kobistan	SU	2000		83,3	EH	PSA	L

PIACENZIAN (±3,4—1,8 my). Map. 11
= ± Romanian (± 3,6—1,8 my).
= ± Aktchagylian (± 3,4—1,8 my).

	1		2	3	4	5	6	7
17d3.	Romagna Apennine	I	1000		62,5	—	PSA, PE	M
253.	Sevan, Shirak, Araks Depr., Erevan Syncl.	SU	500	~1,6	31,3	AD, TR	PSA, PE	L, FT
255.	S. Ciscaucasia E.	SU	700		43,8	—	PSA, PE, LST	B
256.	Middle Kura Depr. W.	SU	1000		62,5	AD, TR	PSE, PSA	B, FT

The large Pliocene marine transgression in the Mediterranean is clearly reflected in the considerable subsidence also in the Paratethys region, in the form of rapid lacustrin and fluvio-terrestrial sedimentation. Regardless of the probably short time difference (0.4 my) between the basement of the Pliocene stages in the Mediterranean relic of Tethys and in Paratethys, there are without doubt high sedimentation rates and thus of course a considerable intensity of subsidence in basins and of young uplifts in the majority of European and Western Asian mountain belts. The 1 000 to 2 000 m of the Pliocene represents in the earlier formed, Upper Miocene basins an average value of over 30 cm/1 000 y.

However extreme values of sedimentation rates have been determined in the *Lower Pliocene*, in a marine environment, too, e.g. in the Radicofani Basin (75 cm/1 000 y), as well as in limnic environment, especially in the Caspian region in Kussaro-Divichin and in the Shemako-Kobistan area north of Great Caucasus (over 100 cm/1 000 y).

Upper Pliocene, in marine development in the region of Romagna, and in freshwater-brackish to terrestrial-fluviatile development in the region between Great and Little Caucasus, displays sedimentation rates exceeding 60 cm/1 000 y. The sedimentation rate was in this time quite extreme on the territory of the even earlier strongly subsiding Eastern Carpathian forefield, attaining values far higher than 300 cm/1 000 y, i.e. a thickness of over 6 000 m.

A very interesting phenomenon occurring in the Pliocene as a whole is the rapid, probably in great above-sea heights occurring sedimentation of limnic and fluvio-terrestrial formations in Anatolia, with values of as much as 60 cm/1 000 y (the boundary between the marine Pliocene of the Mediterranean and freshwater developments in the area of Paratethys). In the rest of the Near East, in Egypt and in the Caucasian region, the sedimentation rates exceeded by far 50 cm and in eastern Turkmenistan they represented minimally 80 cm/1 000 y. All these values indicate a considerable geodynamic activity during the Pliocene, especially in Middle and East Europe and West Asia.

PLIOCENE: ZANCLEAN + PIACENZIAN (±5,4—1,8 my). Map 11
= Dacian + Romanian (± 5,8—1,8 my).
= Kimmerian + Aktchagylian (± 5,8—1,8 my).

	1		2	3	4	5	6	7
14a.	Provence, Camarque, Golfe du Lion	F	1000		27,8	AD,TR	PSA, PE, LST	M, L
17d1.	Salsomaggiore	I	1000		27,8	AD, TR	PE	M
17d2.	Emilia, W. Apennine	I	1000		27,8	AD, TR	PSE, PSA, PE	M
18a1.	Val d'Elsa B.	I	1100		30,6	TR, EH	PSE, PSA, PE	M
18b.	Volterra B.	I	1500		41,7	AD, TR	PSE, PSA, PE	M
23.	Calabria, Crotone B.	I	1000		27,8	AD	PE	M
42a, b.	SW. Akarnania. Pyrgos	GR	1000		27,8	AD, TR	PSA	M, B, L
50c.	Ergene B. Central	TR	2200		61,0	AD	PSE, PSA,PE	L, FT
58a.	Erzincan-Cayirli	TR	1100		30,6	AD	PSE, PSA, VC	L, FT
58d.	Erzurum-Askale	TR	1700	~3,6	47,2	AD	PSE, VC	L, FT
70a.	Hinis. B.	TR	1100		30,6	?	PSE, PSA, LST	Lm FT
151.	Mesopotamian B.	SYR	1500		41,7	AD ?	PSE, PSA, PE	L, FT
353.	Mesopotamian B.	IRQ	1000		27,8	AD	PSE, PSA	L, FT
75a.	Tel Aviv-El Arish	IL, ET	2000		55,6	AD, TR	PSA, PE	M
78.	Jordan Rift Valley	IL	2000		55,6	TR, EH	PSA, PE, EV	B
81a5.	Gulf Suez B.	ET	1000		27,8	TR	PSA, PE	L, FT
82a1, 2, 5.	Nile Delta B.	ET	2300		63,9	AD, TR	PSA, PE	M, B
110.	Bizerte	TN	1000		27,8	AD,TR	PSA, PE	M
111.	Cap Bon	TN	1000		27,8	AD, TR	PSA, PE	M
355.	NE. Iraq B.	IRQ	1000		27,8	?	PSE	FT
205f.	Subcarpath. Fored.	R	7800		195,0	—	PSE, PSA, PE	L, B, FT
205g.	Subcarpath. Fored.	R	1200		30,0	AD, TR	PSE, PSA, PE	B, L
206a.	S. Subcarp. Fored.	R	800		23,0	AD, TR, EH	PE	B, L, FT
220.	Great Plain B.	H	1100		27,5	—	PSE, PSA	L, FT
224a.	Zala-Dráva B.	H	1800		45,0	—	PSE, PSA	B, L
223b.	Banat B., N.	YU	1500		37,5	—	PSA	L, FT
223c.	Banat B., S.	YU	1000		25,0	EH	PSA	L, FT
224b1.	Transtethyan Corr.	YU	1000		25,0	—	PSE, PSA, PE	L
224c.	Mura B.	YU	1400	~4,0	35,0	—	PSE,PSA, PE	L
226.	Sava B.	YU	1400		35,0	—	PSA, PE	L
249.	S. Ciscaucasia, W.	SU	1300		32,5	—	PSA, PE	B, L, FT
252.	Upper Kura Depr., E.	SU	1700		42,5	AD, TR, EH	PSE, PSA	B, L, FT
256b.	Middle Kura Depr. E.	SU	2300		57,5	AD, TR, EH	PSE, PSA	B, L, FT
259.	Lower Kura Depr.	SU	2300		57,5	AD, TR, EH	PSA, PE, VC	B, L
280b.	W. Turkmenistan S.	SU	3200		80,0	AD, TR, EH	PSA, PSE, LST, VC	B, FT

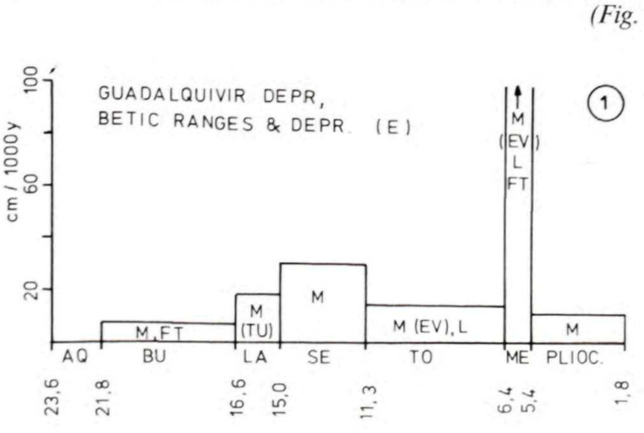
Comparing the above mentioned data with the sedimentation rates in recent seas and on continents, we can state that these were in the Neogene in places extremely high.

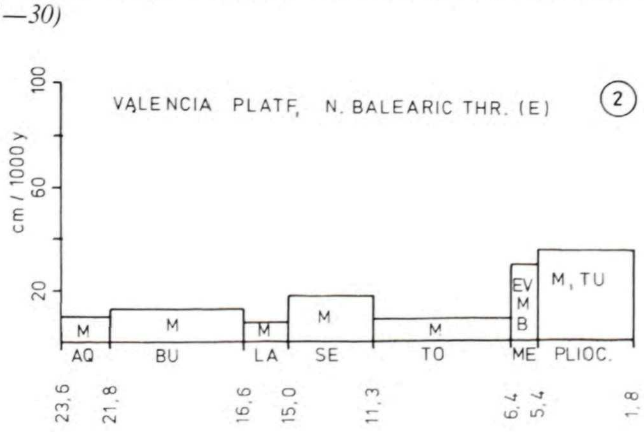
In the recent Adriatic Sea, in the northern and eastern shelf regions, the sedimentation attains only about 2—3 cm/1 000 y (Paul, 1970). Van Straaten's (1965) estimate for the North Adriatic Depression is only 1 cm. Of course, these values are considerably higher in the western Adriatic regions, affected by the contribution of material especially from the river Po (Bombatti and Venzo, 1967). The average overall sedimentation rate of the Holocene Mediterranean Sea does not exceed 10 cm/1 000 y. More rapid sedimentation has been determined in the Black and Caspian Sea, the values attaining as much as 20 cm per 1 000 y. These seas produce above all calcareous pelites. In the Baltic Sea, organogenic black clays are sedimenting at a rate of 30 cm/1000 y. In contrast to these geographically more or less isolated areas, the sedimentation in the abyssal and bathyal of oceans is quite slight. Sedimentation rates of 1.8—4.0 cm per 1 000 y have been measured in the Atlantic Ocean, between Africa and South America; in the Pacific they vary mostly only between 0.4 and 1.5 cm/1 000 y (Goldenberg and Koide, 1962; Moore, 1962). The sedimentation in protected smaller or extensive bays of oceans or inner seas is definitely more rapid. Paul (1970) estimated the sedimentation rate in Limfjord of Northern Adria to be as much as 40 cm, and in Drammefjord in Norwegia the sedimentation attains even 150 cm/1 000 y. Both examples represent extreme exceptions caused by a calm, current-free environment and a considerable contribution of terrigene material. However, similar high or even higher values have been estimated for geographically extensive ocean gulfs, for the areas near the mouths of large river systems. Thus, the sedimentation in the deep Gulf on California attains 60 to 100 cm, the maximum measured in the Gulf of Texas was as much as 383 cm/1 000 y. The evaporite-pelit sedimentation attains in the shallow Gulf of Kara-Bogaz 50—70 cm/1 000 y (Kukal, 1964).

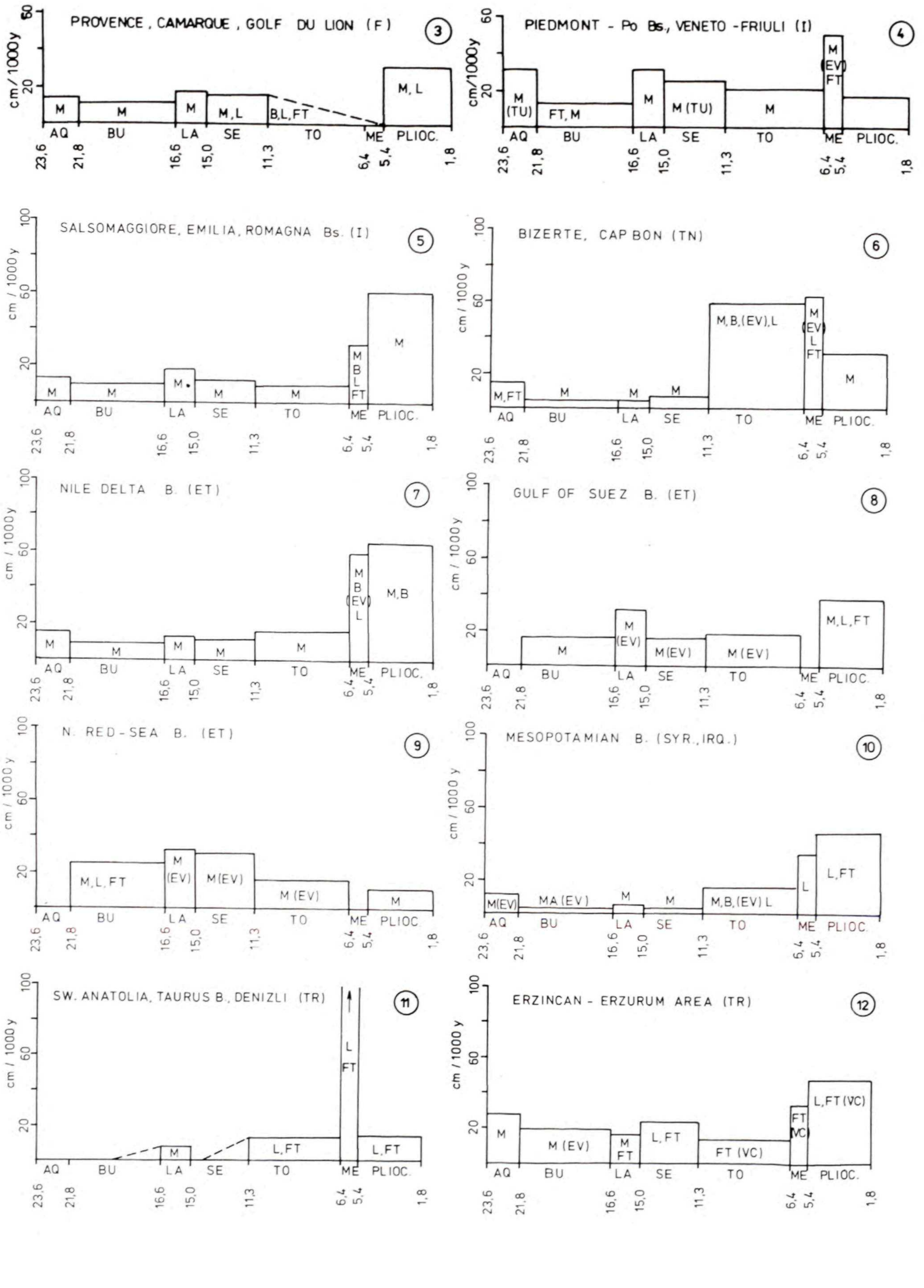
The mentioned relatively high sedimentation rates in the marine environment of the Neogene are thus decidedly an evidence of a considerable ruggedness of the relief in the Circummediterranean region, as well as of sedimentation taking place mostly in a shallower, but calmer open shelf littoral rather than in bathyal environment. In many paleogeographically probably varied regions we assume, especially in the Early and Middle Miocene, considerable uplifts and denudation accompanied by intensive transport of material in river systems from mobile young orogenic regions as well as from consolidated platforms on the margin of the Circummediterranean area. This is also the case in limnic and other terrestrial environments, where smaller lakes and other higher-lying intracontinental depressions display enormously rapid sedimentation, especially in the regions of mountain belts (the same can be observed e.g. in recent Alpine lakes, where sedimentation attains an average of up to 300 cm/1 000 y. (Kukal, 1964). This high sedimentation rate, however, does not apply to brachyhaline to freshwater, geographically extensive Upper Miocene and Pliocene lakes, especially in the Paratethys region. The conditions were here the same as in other marine regions of the Circummediterranean region, where the sedimentation rates were totally dependable of the intensity of the orogenies, transportation and activity of territorially more extensive subsidence regions.

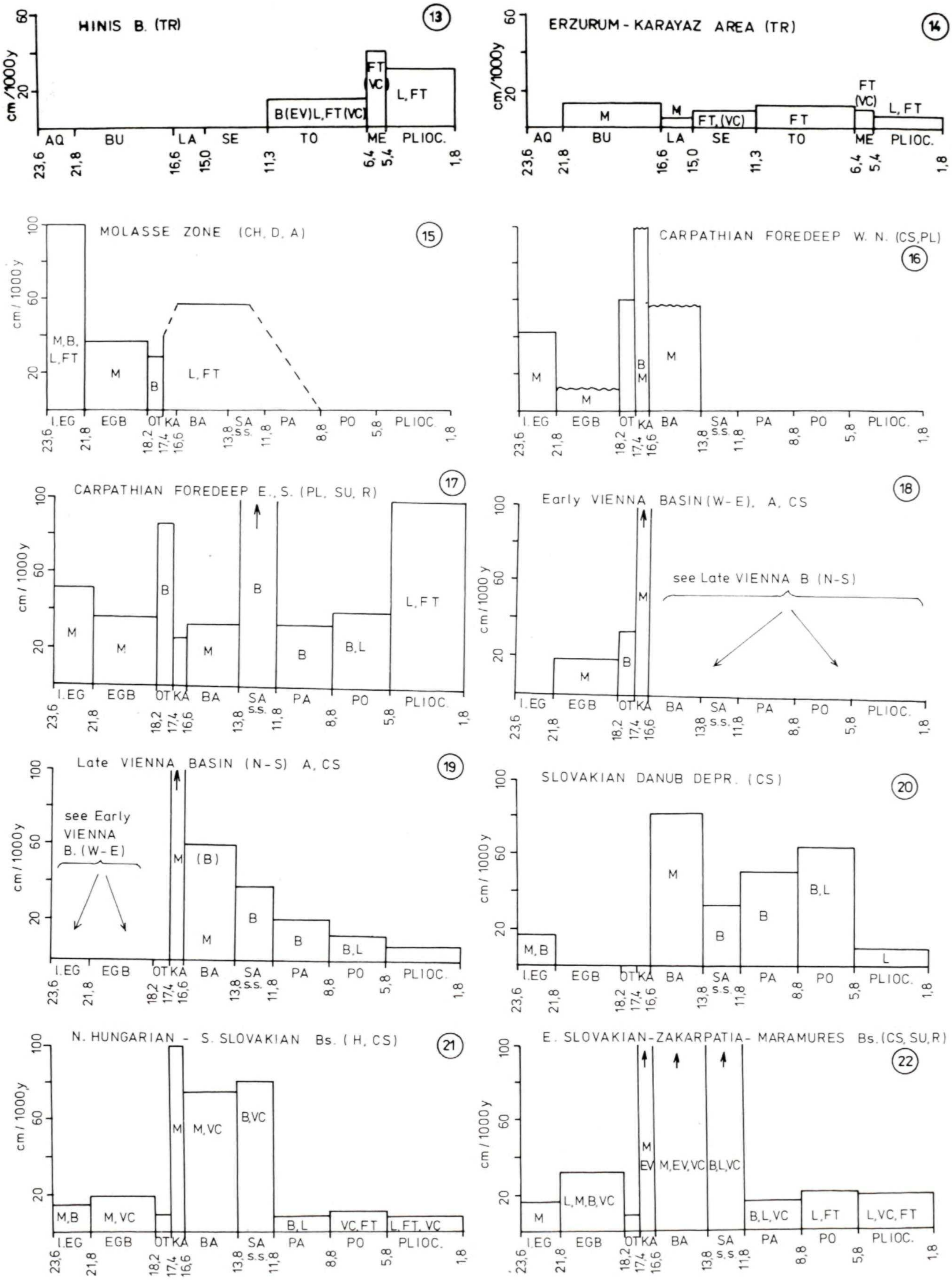
If, on the basis of the latest knowledge, we shall be able to illustrate graphically the intensity of orogenies in time and space and to make a synthesis of this with the general data presented in this paper, we shall definitely be able do evaluate more precisely the time relation of the evolution of many Neogene basins to the mobility of young mountain belts in Europe and Western Asia.

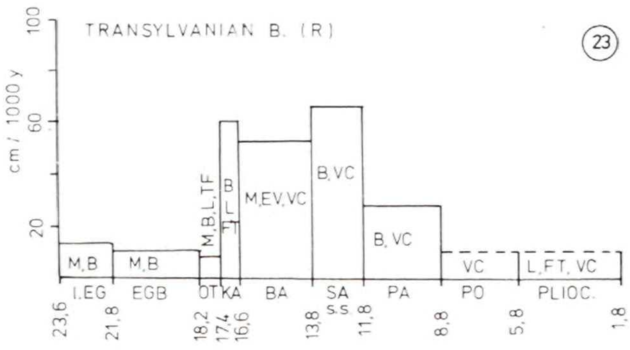
Time succession of estimated minimal sedimentation rates in the Neogene of some Circummediterranean areas (Fig. 1—30)

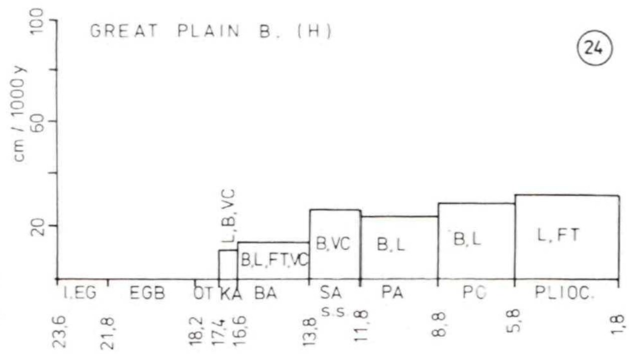


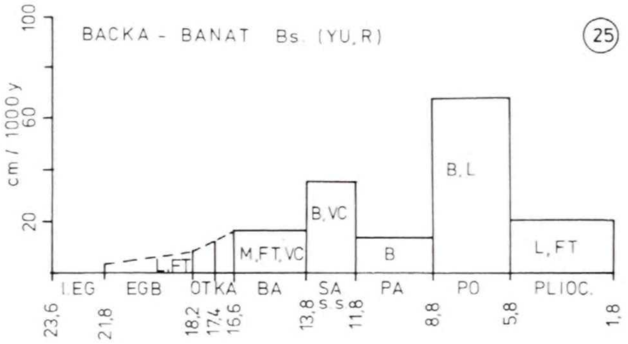


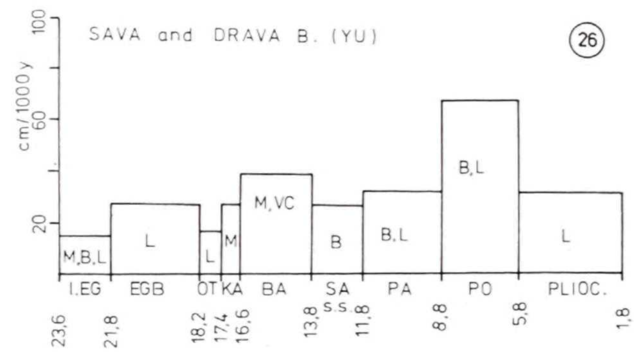

PROVENCE, CAMARQUE, GOLF DU LION (F)
3
cm/1000y
PIEDMONT - Po Bs., VENETO - FRIULI (I)
4
SALSOMAGGIORE, EMILIA, ROMAGNA Bs. (I)
5
BIZERTE, CAP BON (TN)
6
NILE DELTA B. (ET)
7
GULF OF SUEZ B. (ET)
8
N. RED-SEA B. (ET)
9
MESOPOTAMIAN B. (SYR., IRQ.)
10
SW. ANATOLIA, TAURUS B., DENIZLI (TR)
11
ERZINCAN - ERZURUM AREA (TR)
12
AQ BU LA SE TO ME PLIOC.
23,6 21,8 16,6 15,0 11,3 6,4 5,4 1,8

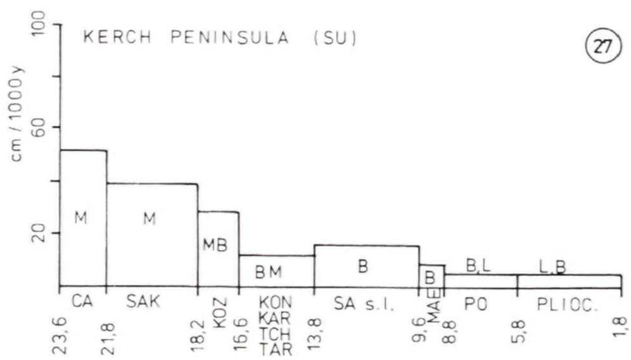

HINIS B. (TR)
13
ERZURUM - KARAYAZ AREA (TR)
14
MOLASSE ZONE (CH, D, A)
15
CARPATHIAN FOREDEEP W. N. (CS, PL)
16
CARPATHIAN FOREDEEP E., S. (PL, SU, R)
17
Early VIENNA BASIN (W-E), A, CS
18
see Late VIENNA B (N-S)
Late VIENNA BASIN (N-S) A, CS
19
see Early VIENNA B. (W-E)
SLOVAKIAN DANUB DEPR. (CS)
20
N. HUNGARIAN - S. SLOVAKIAN Bs. (H, CS)
21
E. SLOVAKIAN-ZAKARPATIA- MARAMURES Bs. (CS, SU, R)
22
cm/1000y
AQ
BU
LA
SE
TO
ME
PLIOC.
I.EG
EGB
OT
KA
BA
SA s.s.
PA
PO
B(EV)L,FT(VC)
FT (VC)
L,FT
M,B, L,FT
M
B
M,EV,VC
B,L,VC
L,M,B,VC
B,L,VC
L,VC,FT
M,VC
B,VC
VC,FT
L,FT,VC
M,B
B,L
L
M (B)

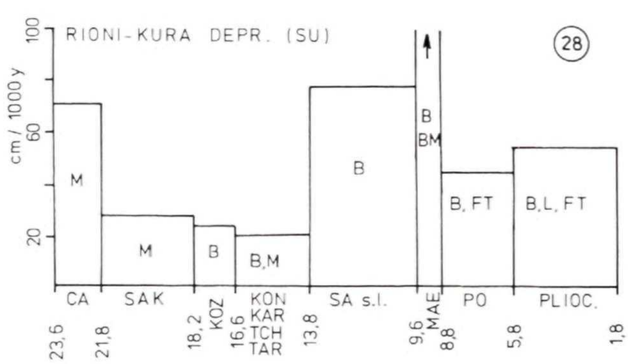

TRANSYLVANIAN B. (R)
23
cm / 1000 y
100
60
20
M,B
M,B
M,B,L,TF
B
L
FT
M,EV,VC
B,VC
B,VC
VC
L,FT,VC
I.EG
EGB
OT
KA
BA
SA s.s.
PA
PO
PLIOC.
23,6
21,8
18,2
17,4
16,6
13,8
11,8
8,8
5,8
1,8

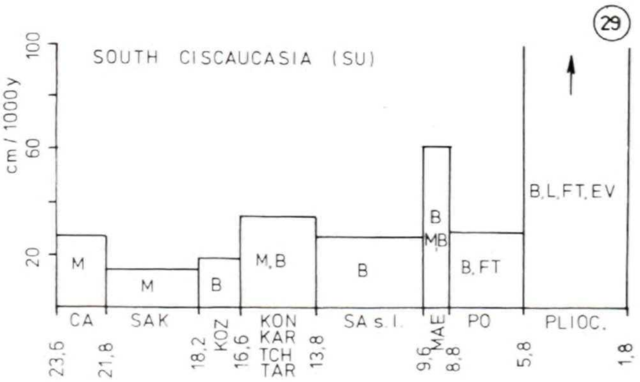

GREAT PLAIN B. (H)
24
cm / 1000 y
100
60
20
L,B,VC
B,L,FT,VC
B,VC
B,L
B,L
L,FT
I.EG
EGB
OT
KA
BA
SA s.s.
PA
PO
PLIOC.
23,6
21,8
18,2
17,4
16,6
13,8
11,8
8,8
5,8
1,8

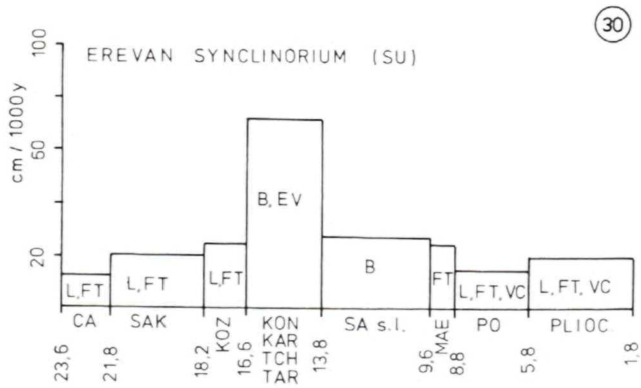

BACKA - BANAT Bs. (YU,R)
25
cm / 1000 y
100
60
20
L,FT
M,FT,VC
B,VC
B
B,L
L,FT
I.EG
EGB
OT
KA
BA
SA s.s.
PA
PO
PLIOC.
23,6
21,8
18,2
17,4
16,6
13,8
11,8
8,8
5,8
1,8

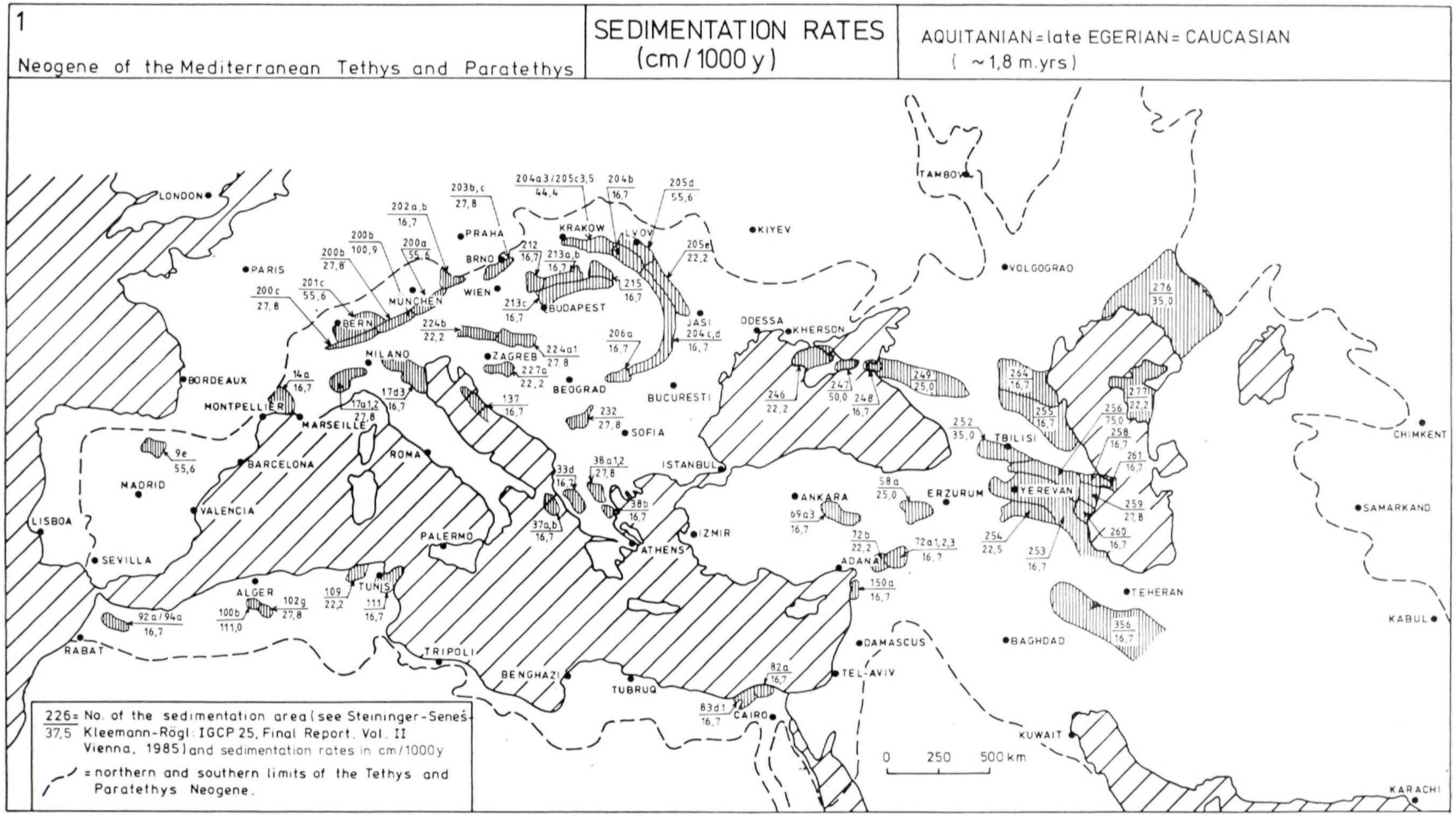

SAVA and DRAVA B. (YU)
26
cm/1000 y
100
60
20
M,B,L
L
L
M
M,VC
B
B,L
B,L
L
I.EG
EGB
OT
KA
BA
SA s.s.
PA
PO
PLIOC.
23,6
21,8
18,2
17,4
16,6
13,8
11,8
8,8
5,8
1,8

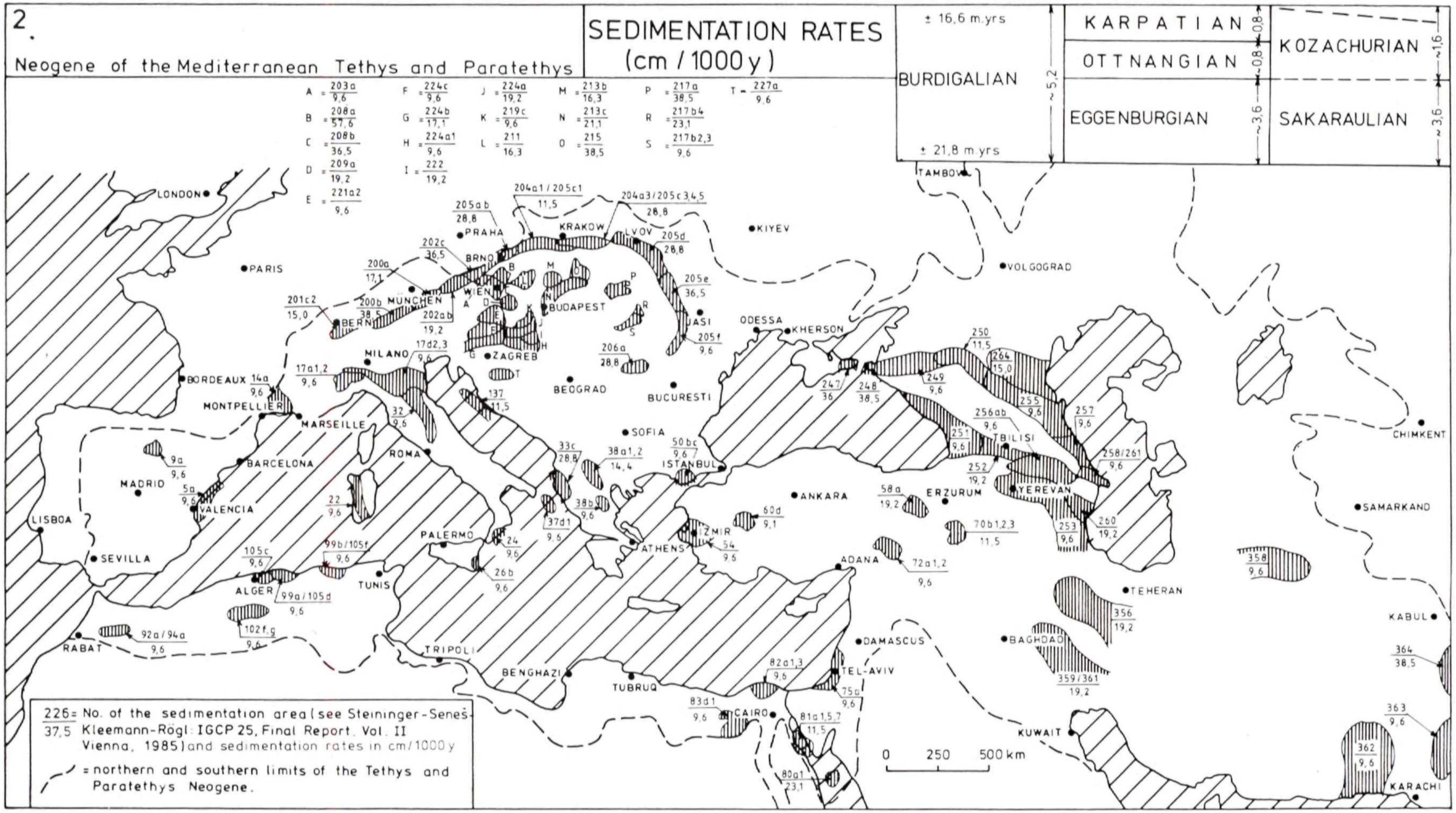

KERCH PENINSULA (SU)
27
cm / 1000 y
100
60
20
M
M
MB
BM
B
B
B,L
L,B
CA
SAK
KOZ
KON
KAR
TCH
TAR
SA s.l.
MAE
PO
PLIOC.
23,6
21,8
18,2
16,6
13,8
9,6
8,8
5,8
1,8


RIONI-KURA DEPR. (SU)
28
cm / 1000 y
100
60
20
M
M
B
B,M
B
B
BM
B,FT
B,L,FT
CA
SAK
KOZ
KON
KAR
TCH
TAR
SA s.l.
MAE
PO
PLIOC.
23,6
21,8
18,2
16,6
13,8
9,6
8,8
5,8
1,8

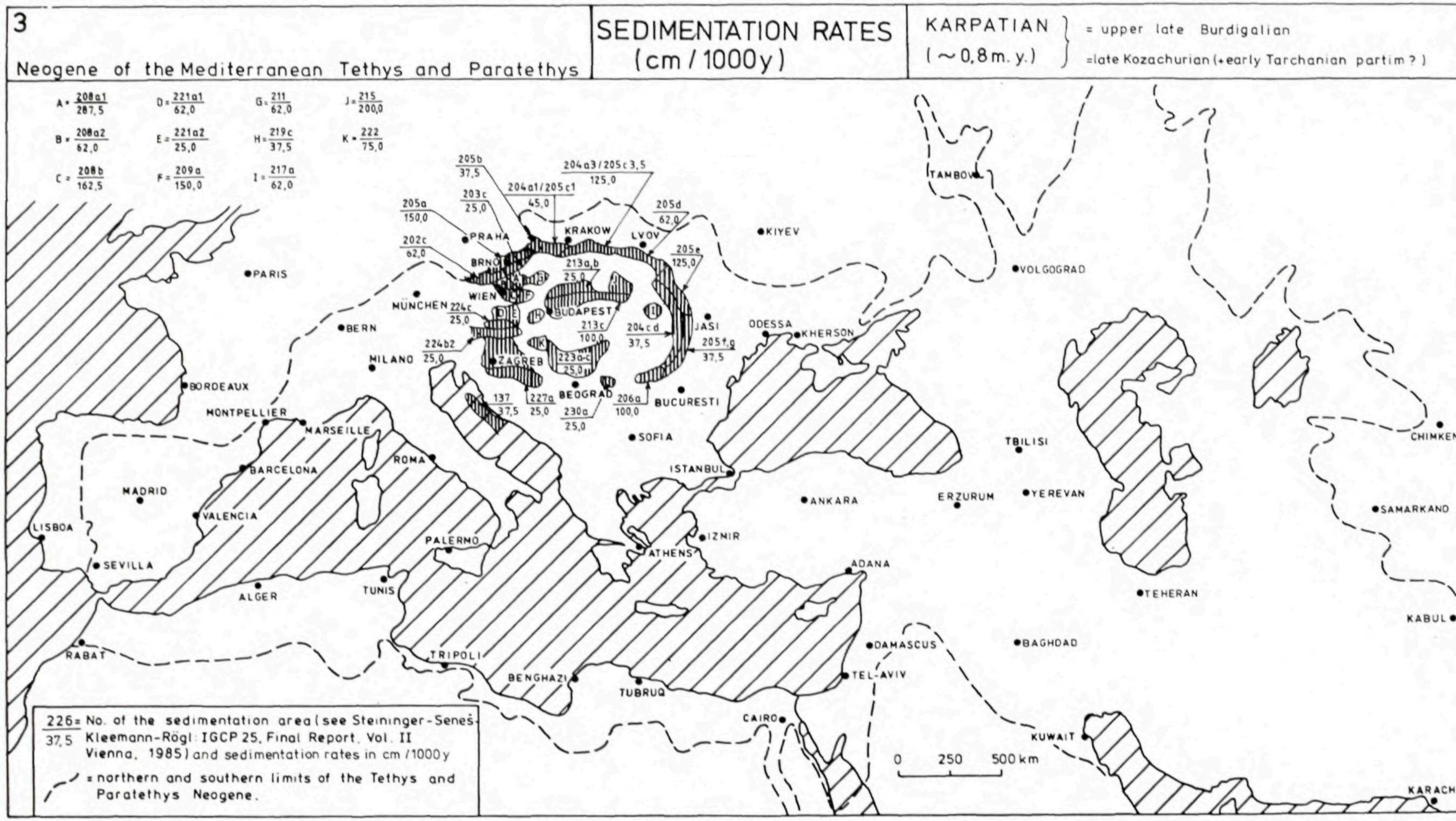

SOUTH CISCAUCASIA (SU)
29
cm / 1000 y
100
60
20
M
M
B
M,B
B
B
MB
B,FT
B,L,FT,EV
CA
SAK
KOZ
KON
KAR
TCH
TAR
SA s.l.
MAE
PO
PLIOC.
23,5
21,8
18,2
16,6
13,8
9,6
8,8
5,8
1,8

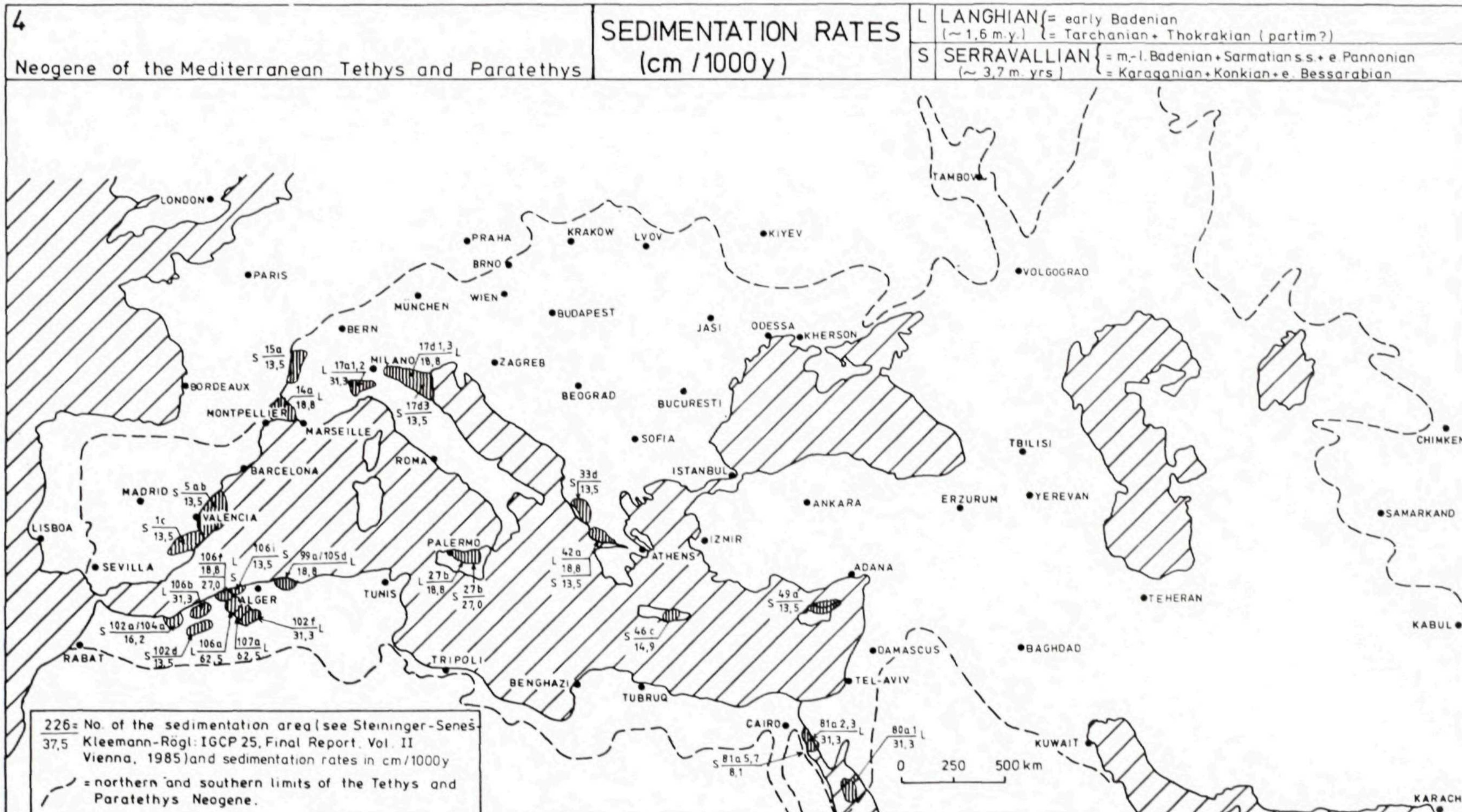

EREVAN SYNCLINORIUM (SU)
30
cm / 1000 y
100
50
20
L,FT
L,FT
L,FT
B,EV
B
FT
L,FT,VC
L,FT,VC
CA
SAK
KOZ
KON
KAR
TCH
TAR
SA s.l.
MAE
PO
PLIOC.
23,6
21,8
18,2
16,6
13,8
9,6
8,8
5,8
1,8

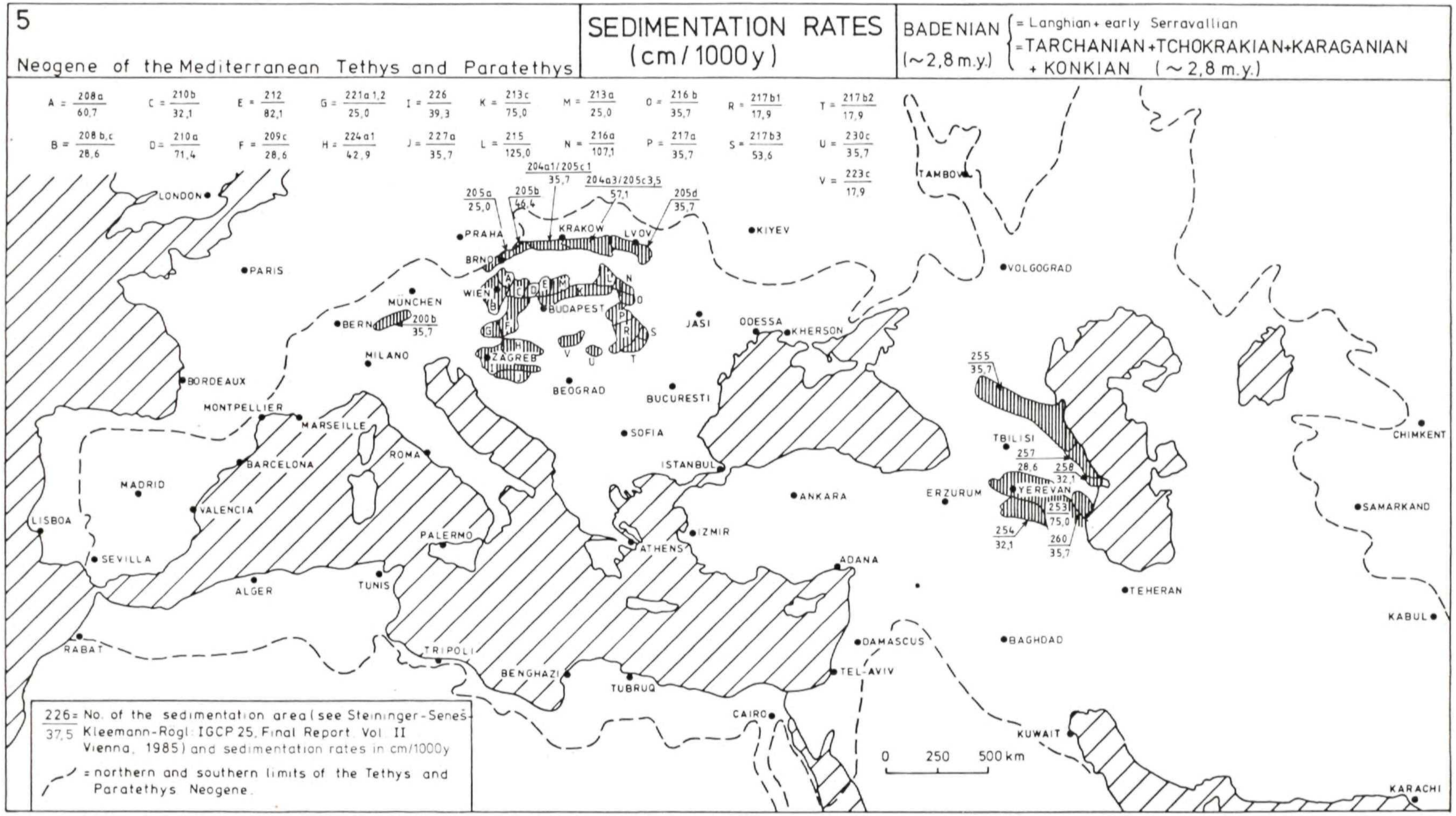

1
Neogene of the Mediterranean Tethys and Paratethys
SEDIMENTATION RATES
(cm / 1000 y)
AQUITANIAN = late EGERIAN = CAUCASIAN
(~1,8 m.yrs)
LONDON
PARIS
BORDEAUX
MONTPELLIER
MARSEILLE
BARCELONA
MADRID
VALENCIA
LISBOA
SEVILLA
RABAT
ALGER
TUNIS
TRIPOLI
BENGHAZI
TUBRUQ
CAIRO
TEL-AVIV
DAMASCUS
BAGHDAD
KUWAIT
KARACHI
TEHERAN
KABUL
SAMARKAND
CHIMKENT
VOLGOGRAD
TAMBOV
KIYEV
ODESSA
KHERSON
TBILISI
YEREVAN
ERZURUM
ANKARA
ADANA
IZMIR
ISTANBUL
ATHENS
SOFIA
BUCURESTI
BEOGRAD
ZAGREB
BUDAPEST
WIEN
BRNO
PRAHA
KRAKOW
LVOV
JASI
MÜNCHEN
BERN
MILANO
ROMA
PALERMO
0 250 500 km
226 = No. of the sedimentation area (see Steininger-Seneš-Kleemann-Rögl: IGCP 25, Final Report, Vol. II Vienna, 1985) and sedimentation rates in cm/1000y
37,5
= northern and southern limits of the Tethys and Paratethys Neogene.



2.
Neogene of the Mediterranean Tethys and Paratethys
SEDIMENTATION RATES
(cm / 1000 y)
± 16,6 m.yrs
BURDIGALIAN
~5,2
± 21,8 m.yrs
KARPATIAN
~0,8
OTTNANGIAN
~0,8
EGGENBURGIAN
~3,6
KOZACHURIAN
~1,6
SAKARAULIAN
~3,6
226 = No. of the sedimentation area (see Steininger-Senes-Kleemann-Rögl: IGCP 25, Final Report, Vol. II Vienna, 1985) and sedimentation rates in cm/1000 y
37,5
= northern and southern limits of the Tethys and Paratethys Neogene.
0 250 500 km
LONDON
PARIS
PRAHA
KRAKOW
LVOV
KIYEV
TAMBOV
VOLGOGRAD
BRNO
WIEN
MÜNCHEN
BERN
BUDAPEST
ZAGREB
MILANO
BORDEAUX
MONTPELLIER
MARSEILLE
BEOGRAD
BUCURESTI
IASI
ODESSA
KHERSON
SOFIA
ISTANBUL
ANKARA
ERZURUM
TBILISI
YEREVAN
CHIMKENT
SAMARKAND
TEHERAN
KABUL
BAGHDAD
KUWAIT
KARACHI
DAMASCUS
TEL-AVIV
CAIRO
ADANA
IZMIR
ATHENS
TUBRUQ
BENGHAZI
TRIPOLI
TUNIS
PALERMO
ROMA
ALGER
RABAT
SEVILLA
LISBOA
MADRID
VALENCIA
BARCELONA


3
Neogene of the Mediterranean Tethys and Paratethys
SEDIMENTATION RATES (cm / 1000y)
KARPATIAN (~0,8 m. y.)
= upper late Burdigalian
= late Kozachurian (+ early Tarchanian partim ?)
A = 208a1 / 287,5
B = 208a2 / 62,0
C = 208b / 162,5
D = 221a1 / 62,0
E = 221a2 / 25,0
F = 209a / 150,0
G = 211 / 62,0
H = 219c / 37,5
I = 217a / 62,0
J = 215 / 200,0
K = 222 / 75,0
205b / 37,5
203c / 25,0
205a / 150,0
202c / 62,0
204a1/205c1 / 45,0
204a3/205c3,5 / 125,0
205d / 62,0
205e / 125,0
213a,b / 25,0
213c / 100,0
204cd / 37,5
205f,g / 37,5
224c / 25,0
224b2 / 25,0
223a-c / 25,0
137 / 37,5
227a / 25,0
230a / 25,0
206a / 100,0
PRAHA
BRNO
WIEN
KRAKOW
LVOV
KIYEV
MÜNCHEN
BUDAPEST
JASI
ODESSA
KHERSON
ZAGREB
BEOGRAD
BUCURESTI
SOFIA
PARIS
BERN
MILANO
BORDEAUX
MONTPELLIER
MARSEILLE
ROMA
BARCELONA
MADRID
VALENCIA
LISBOA
SEVILLA
PALERMO
ALGER
TUNIS
RABAT
TRIPOLI
BENGHAZI
TUBRUQ
CAIRO
TEL-AVIV
DAMASCUS
ADANA
ISTANBUL
IZMIR
ATHENS
ANKARA
ERZURUM
TBILISI
YEREVAN
TEHERAN
BAGHDAD
KUWAIT
KARACHI
KABUL
SAMARKAND
CHIMKENT
VOLGOGRAD
TAMBOV
0 250 500 km
226 / 37,5 = No. of the sedimentation area (see Steininger-Seneš-Kleemann-Rögl: IGCP 25, Final Report, Vol. II Vienna, 1985) and sedimentation rates in cm / 1000y
= northern and southern limits of the Tethys and Paratethys Neogene.


4
Neogene of the Mediterranean Tethys and Paratethys
SEDIMENTATION RATES
(cm / 1000 y)
L LANGHIAN (~ 1,6 m.y.) = early Badenian = Tarchanian + Thokrakian (partim?)
S SERRAVALLIAN (~ 3,7 m. yrs) = m.-l. Badenian + Sarmatian s.s. + e. Pannonian = Karaganian + Konkian + e. Bessarabian
LONDON
PARIS
PRAHA
BRNO
KRAKOW
LVOV
KIYEV
TAMBOV
VOLGOGRAD
MÜNCHEN
WIEN
BUDAPEST
JASI
ODESSA
KHERSON
BERN
ZAGREB
MILANO
BEOGRAD
BUCURESTI
BORDEAUX
MONTPELLIER
MARSEILLE
SOFIA
ROMA
BARCELONA
ISTANBUL
MADRID
VALENCIA
LISBOA
SEVILLA
ANKARA
ERZURUM
TBILISI
YEREVAN
CHIMKENT
SAMARKAND
IZMIR
ATHENS
PALERMO
TUNIS
ALGER
RABAT
TRIPOLI
BENGHAZI
TUBRUQ
ADANA
DAMASCUS
TEL-AVIV
BAGHDAD
TEHERAN
KABUL
CAIRO
KUWAIT
KARACHI
0 250 500 km
226 = No. of the sedimentation area (see Steininger-Seneš-Kleemann-Rögl: IGCP 25, Final Report, Vol. II Vienna, 1985) and sedimentation rates in cm/1000y
37,5
= northern and southern limits of the Tethys and Paratethys Neogene.


5
Neogene of the Mediterranean Tethys and Paratethys
SEDIMENTATION RATES (cm/1000y)
BADENIAN (~2,8 m.y.) = Langhian + early Serravallian
= TARCHANIAN + TCHOKRAKIAN + KARAGANIAN + KONKIAN (~2,8 m.y.)
A = 208a / 60,7
B = 208 b,c / 28,6
C = 210b / 32,1
D = 210a / 71,4
E = 212 / 82,1
F = 209c / 28,6
G = 221a 1,2 / 25,0
H = 224a1 / 42,9
I = 226 / 39,3
J = 227a / 35,7
K = 213c / 75,0
L = 215 / 125,0
M = 213a / 25,0
N = 216a / 107,1
O = 216 b / 35,7
P = 217a / 35,7
R = 217b1 / 17,9
S = 217b3 / 53,6
T = 217b2 / 17,9
U = 230c / 35,7
V = 223c / 17,9
204a1/205c1 / 35,7
204a3/205c3,5 / 57,1
205a / 25,0
205b / 46,4
205d / 35,7
200b / 35,7
255 / 35,7
257 / 28,6
258 / 32,1
253 / 75,0
254 / 32,1
260 / 35,7
LONDON
PARIS
BORDEAUX
MONTPELLIER
MARSEILLE
BARCELONA
MADRID
VALENCIA
LISBOA
SEVILLA
RABAT
ALGER
TUNIS
TRIPOLI
BENGHAZI
TUBRUQ
CAIRO
PALERMO
ROMA
MILANO
BERN
MÜNCHEN
PRAHA
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WIEN
KRAKOW
LVOV
BUDAPEST
ZAGREB
BEOGRAD
BUCURESTI
SOFIA
ISTANBUL
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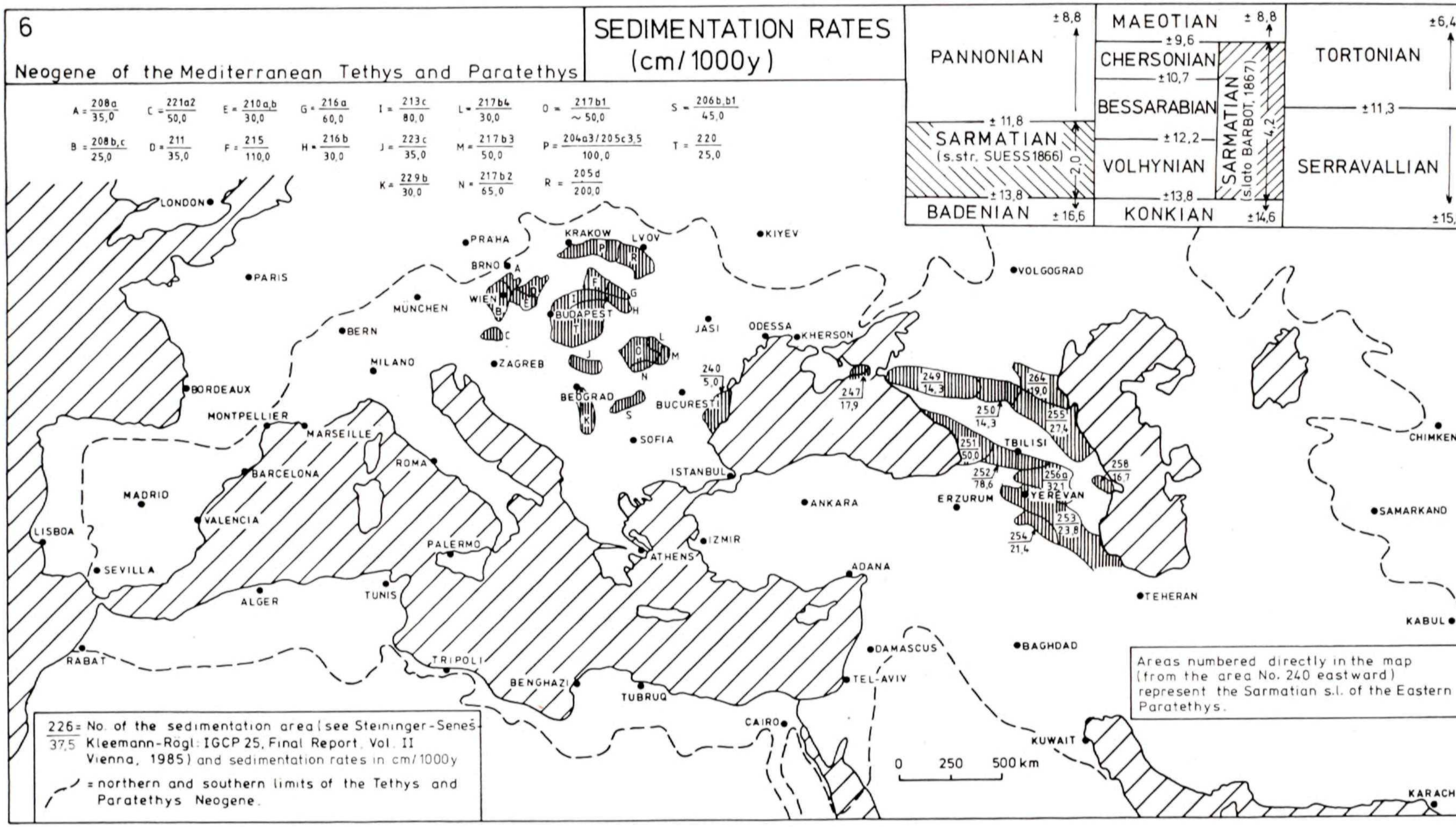
ADANA
JASI
ODESSA
KHERSON
KIYEV
TAMBOV
VOLGOGRAD
TBILISI
YEREVAN
ERZURUM
TEHERAN
BAGHDAD
DAMASCUS
TEL-AVIV
KUWAIT
KARACHI
KABUL
SAMARKAND
CHIMKENT
0 250 500 km
226 / 37,5 = No. of the sedimentation area (see Steininger-Seneš-Kleemann-Rögl: IGCP 25, Final Report, Vol. II Vienna, 1985) and sedimentation rates in cm/1000y
= northern and southern limits of the Tethys and Paratethys Neogene.


6
Neogene of the Mediterranean Tethys and Paratethys
SEDIMENTATION RATES (cm/1000y)
PANNONIAN ±8,8
SARMATIAN (s.str. SUESS 1866) ±11,8 ±13,8 2,0
BADENIAN ±16,6
MAEOTIAN ±8,8
±9,6
CHERSONIAN
±10,7
BESSARABIAN
±12,2
VOLHYNIAN
±13,8
KONKIAN ±14,6
SARMATIAN (s.lato BARBOT, 1867) 4,2
TORTONIAN ±6,4
±11,3
SERRAVALLIAN ±15,0
A = 208a/35,0
B = 208b,c/25,0
C = 221a2/50,0
D = 211/35,0
E = 210a,b/30,0
F = 215/110,0
G = 216a/60,0
H = 216b/30,0
I = 213c/80,0
J = 223c/35,0
K = 229b/30,0
L = 217b4/30,0
M = 217b3/50,0
N = 217b2/65,0
O = 217b1/~50,0
P = 204a3/205c3,5/100,0
R = 205d/200,0
S = 206b,b1/45,0
T = 220/25,0
240/5,0
247/17,9
249/14,3
250/14,3
251/50,0
252/78,6
253/23,8
254/21,4
255/27,4
256a/32,1
258/16,7
264/19,0
LONDON
PARIS
BORDEAUX
MONTPELLIER
MARSEILLE
BARCELONA
MADRID
VALENCIA
LISBOA
SEVILLA
ALGER
TUNIS
RABAT
TRIPOLI
BENGHAZI
TUBRUQ
CAIRO
PRAHA
BRNO
WIEN
MÜNCHEN
BERN
MILANO
ZAGREB
BUDAPEST
KRAKOW
LVOV
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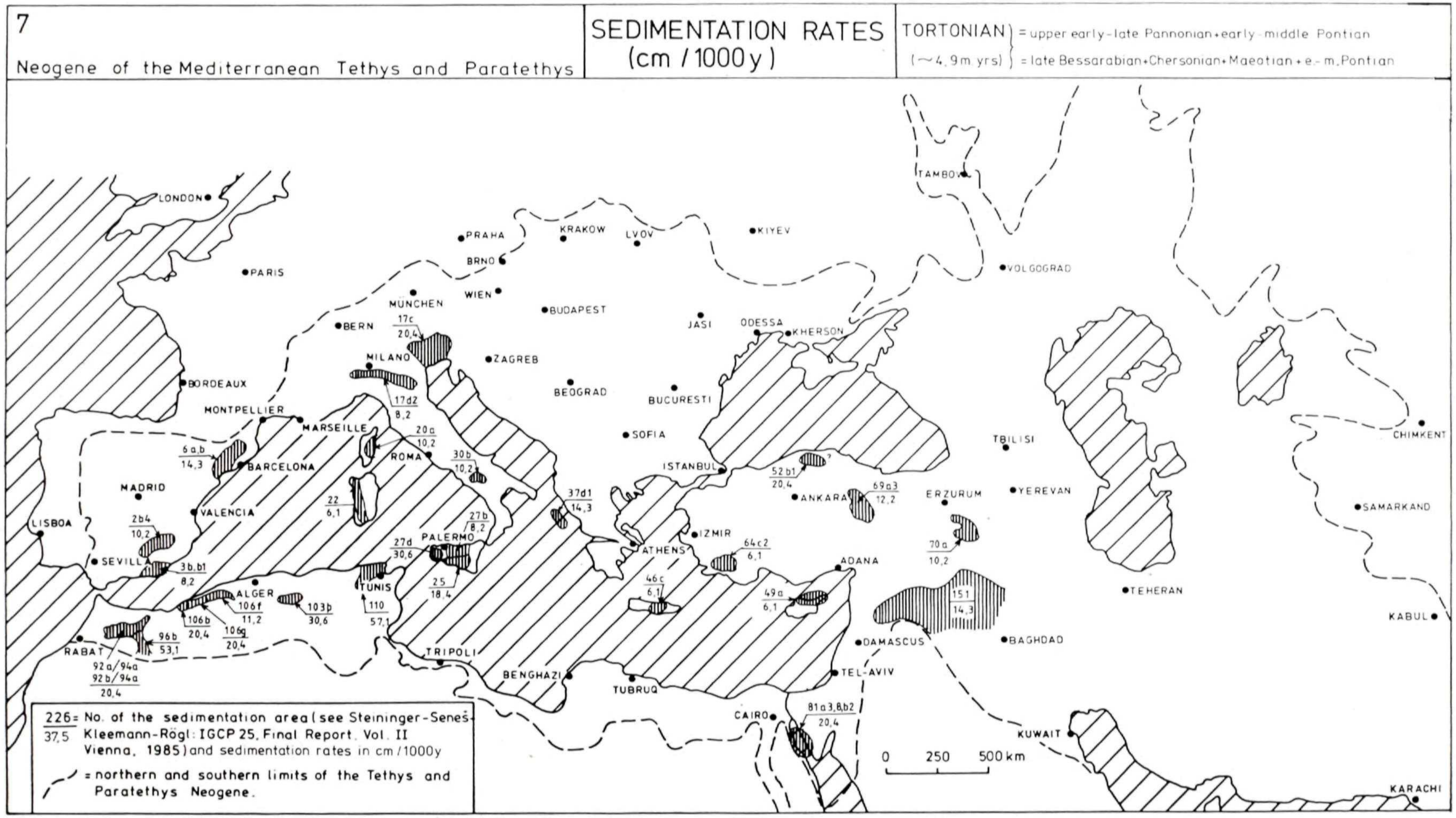
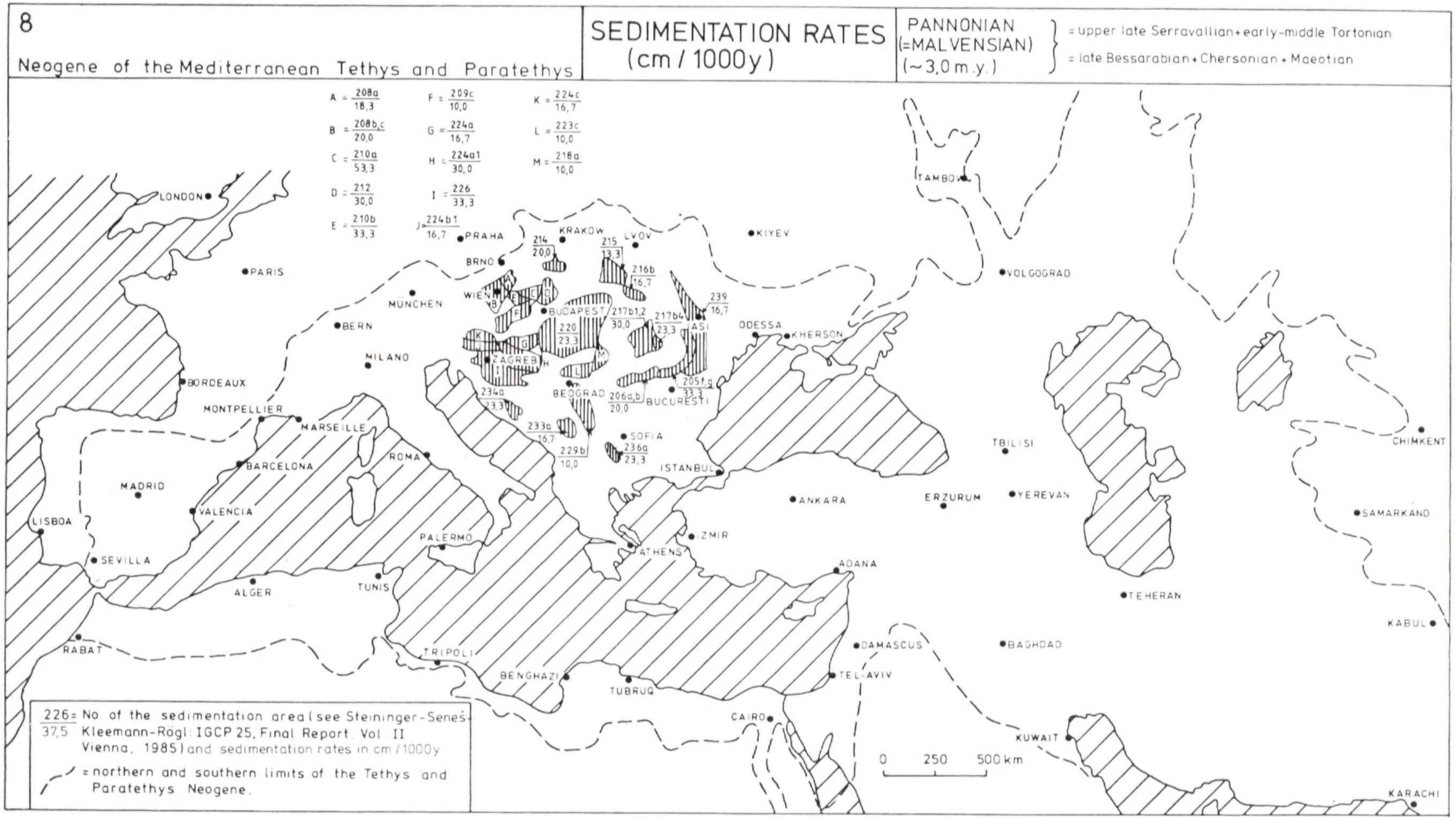
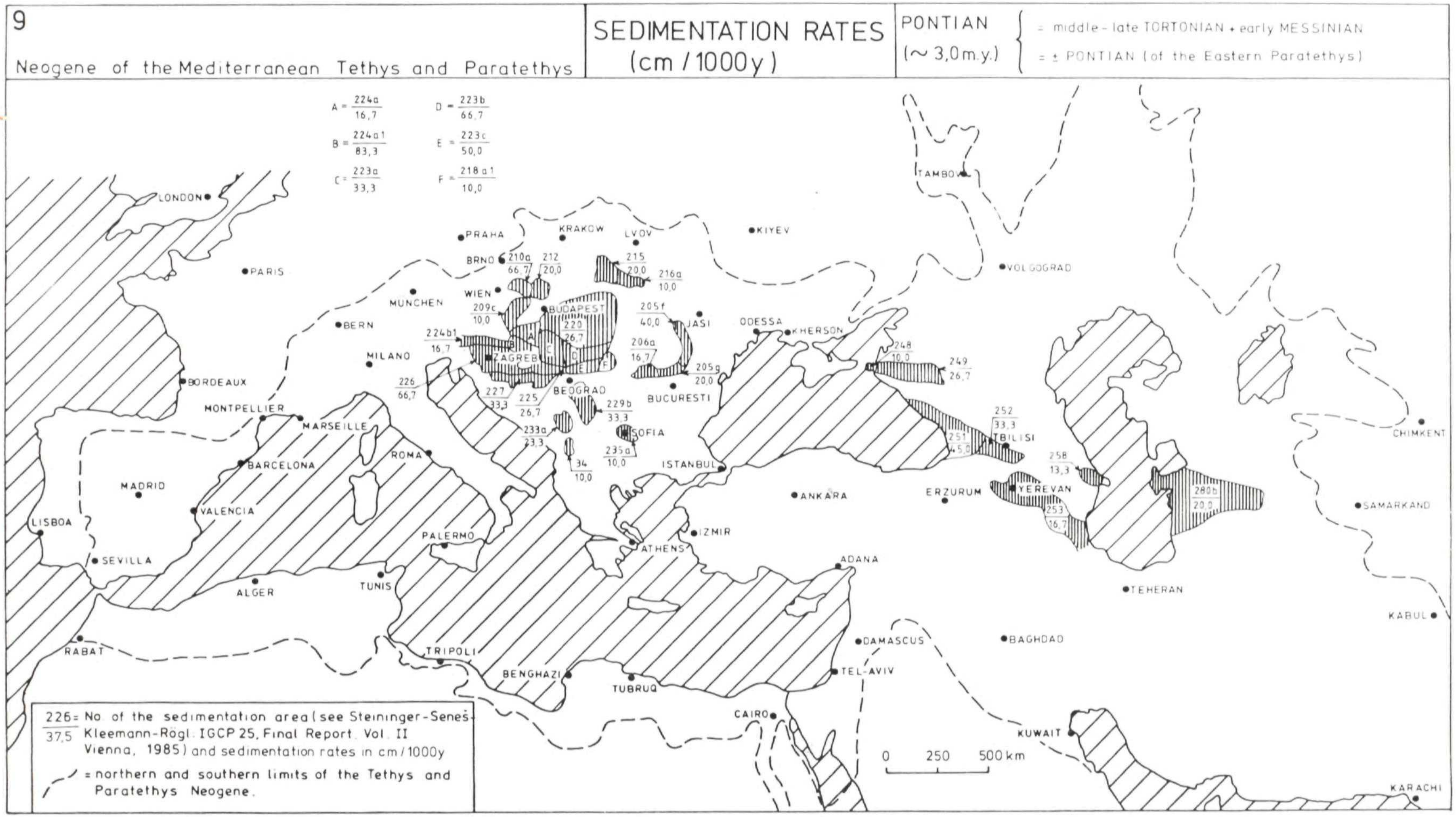
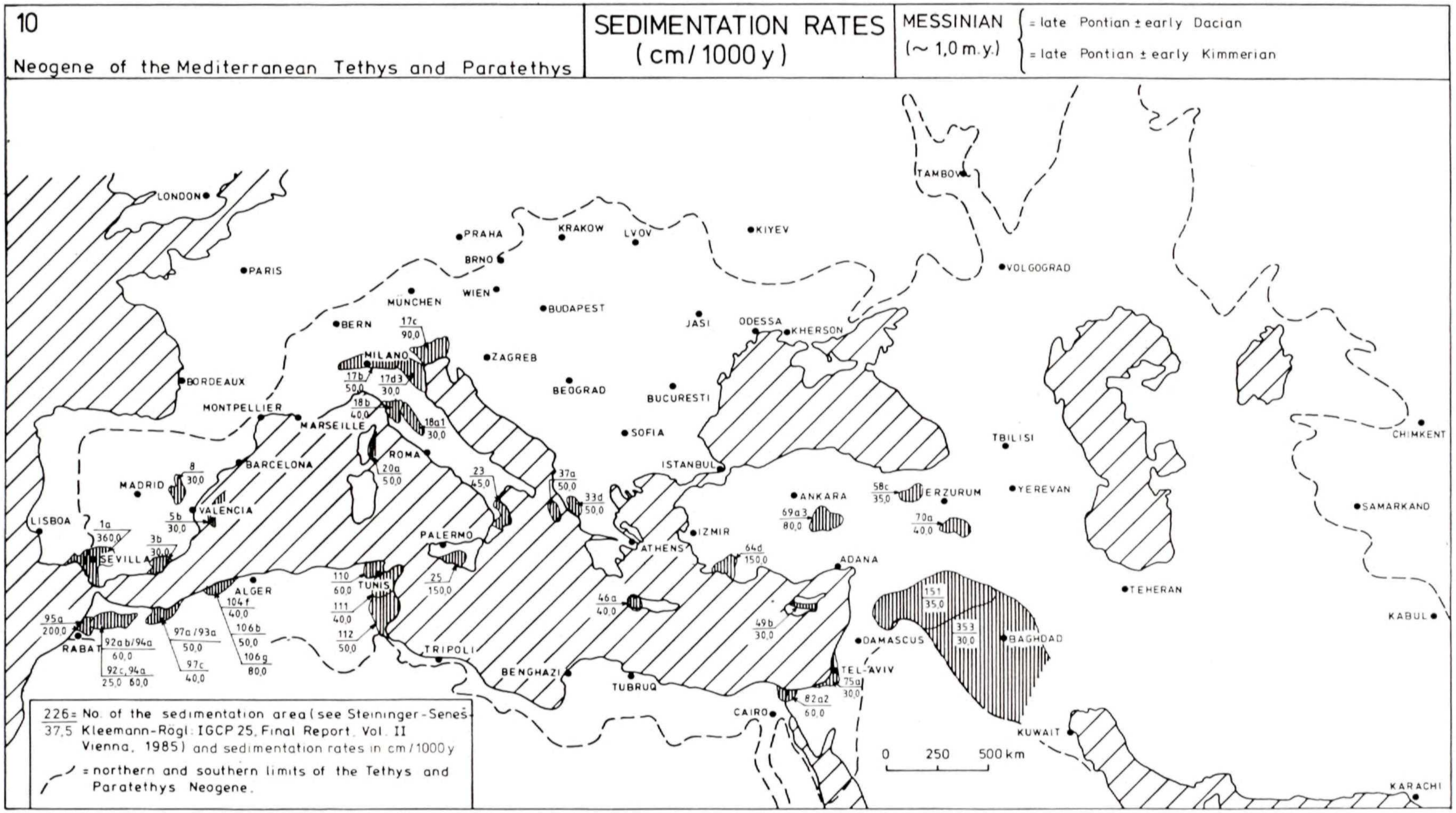
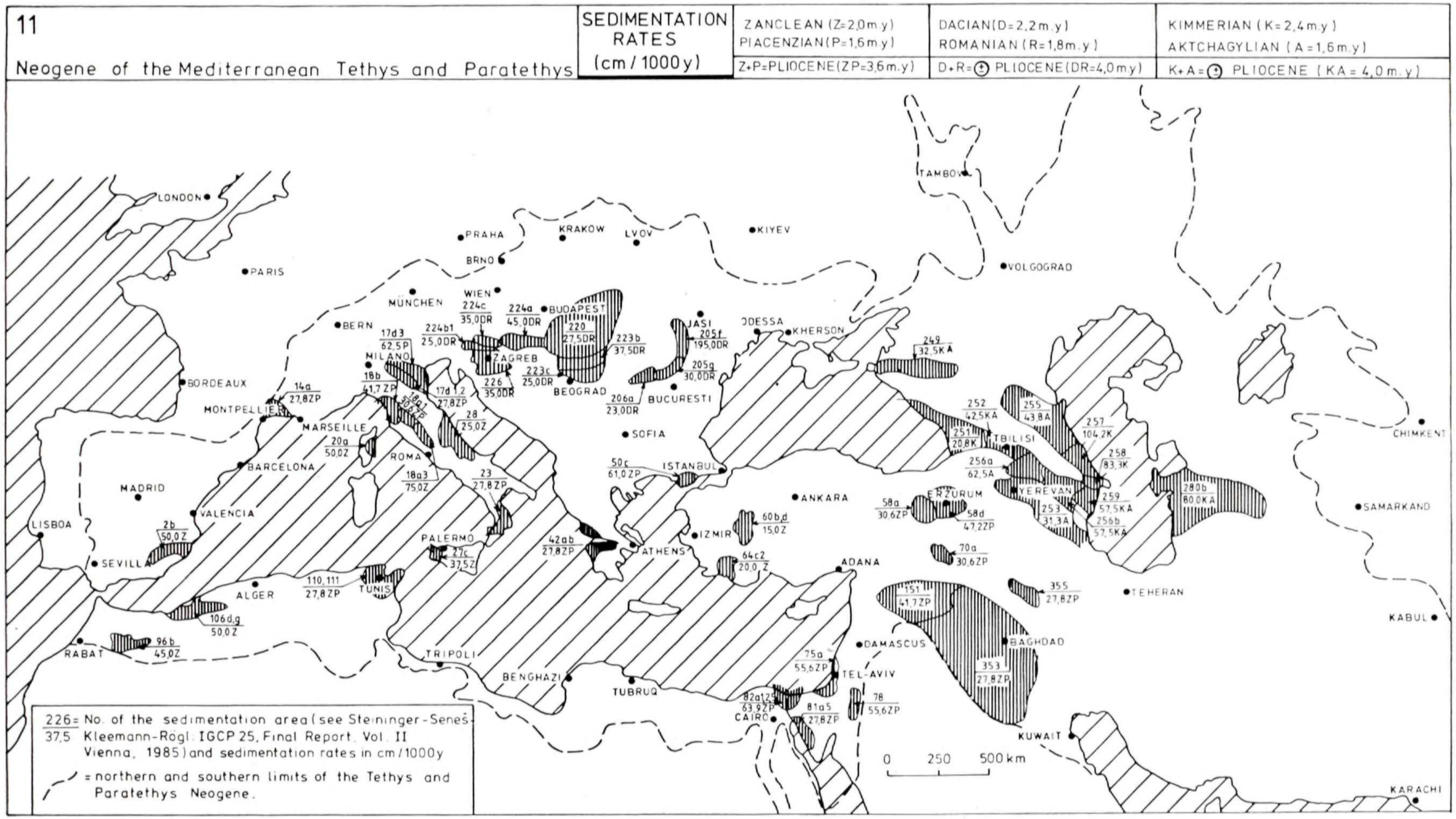
BUCURESTI
SOFIA
ISTANBUL
ATHENS
IZMIR
ROMA
PALERMO
JASI
ODESSA
KHERSON
KIYEV
VOLGOGRAD
TBILISI
YEREVAN
ERZURUM
ANKARA
ADANA
DAMASCUS
TEL-AVIV
BAGHDAD
TEHERAN
KUWAIT
KARACHI
KABUL
SAMARKAND
CHIMKENT
0 250 500 km
Areas numbered directly in the map (from the area No. 240 eastward) represent the Sarmatian s.l. of the Eastern Paratethys.
226/37,5 = No. of the sedimentation area (see Steininger-Seneš-Kleemann-Rogl: IGCP 25, Final Report, Vol. II Vienna, 1985) and sedimentation rates in cm/1000y
= northern and southern limits of the Tethys and Paratethys Neogene.

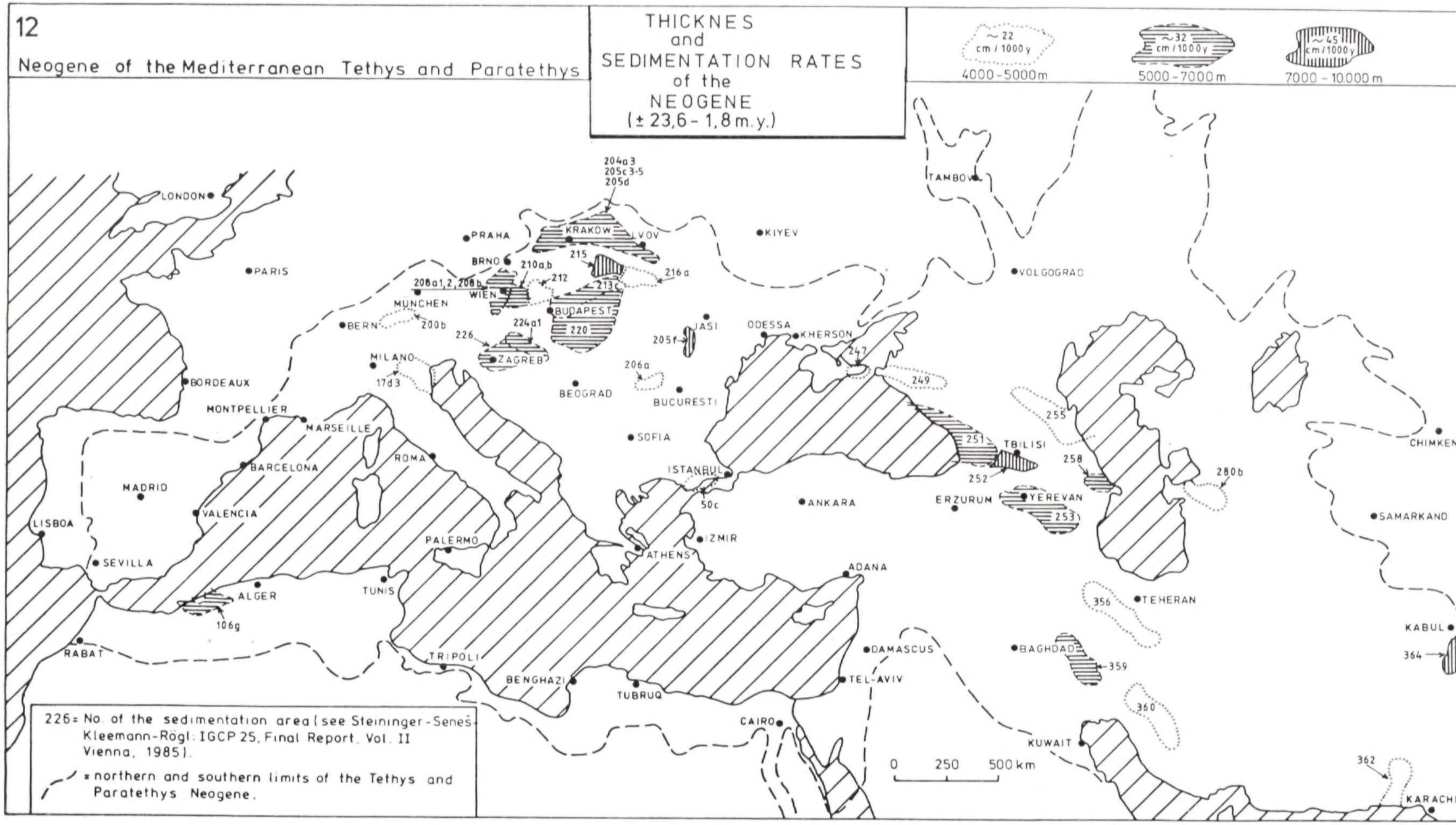

7
Neogene of the Mediterranean Tethys and Paratethys
SEDIMENTATION RATES
(cm / 1000 y)
TORTONIAN = upper early - late Pannonian + early - middle Pontian
(~4,9 m yrs) = late Bessarabian + Chersonian + Maeotian + e.- m. Pontian
LONDON
PARIS
PRAHA
BRNO
KRAKOW
LVOV
KIYEV
TAMBOV
VOLGOGRAD
WIEN
MÜNCHEN
BERN
BUDAPEST
JASI
ODESSA
KHERSON
ZAGREB
MILANO
BORDEAUX
BEOGRAD
BUCURESTI
MONTPELLIER
MARSEILLE
SOFIA
TBILISI
CHIMKENT
ROMA
ISTANBUL
BARCELONA
MADRID
ANKARA
ERZURUM
YEREVAN
SAMARKAND
VALENCIA
LISBOA
PALERMO
ATHENS
IZMIR
SEVILLA
ADANA
TEHERAN
ALGER
TUNIS
KABUL
RABAT
TRIPOLI
BENGHAZI
TUBRUQ
DAMASCUS
BAGHDAD
TEL-AVIV
CAIRO
KUWAIT
KARACHI
17c
20,4
17d2
8,2
20a
10,2
30b
10,2
6a,b
14,3
22
6,1
27b
8,2
27d
30,6
25
18,4
37d1
14,3
52b1
20,4
69a3
12,2
64c2
6,1
46c
6,1
49a
6,1
70a
10,2
151
14,3
2b4
10,2
3b,b1
8,2
106f
11,2
106b
20,4
106g
20,4
103b
30,6
110
57,1
96b
53,1
92a/94a
92b/94a
20,4
81a3,8,b2
20,4
0 250 500 km
226 = No. of the sedimentation area (see Steininger-Seneš-Kleemann-Rögl: IGCP 25, Final Report. Vol. II
37,5 Vienna, 1985) and sedimentation rates in cm/1000y
= northern and southern limits of the Tethys and Paratethys Neogene.


8
Neogene of the Mediterranean Tethys and Paratethys
SEDIMENTATION RATES
(cm / 1000y)
PANNONIAN
(=MALVENSIAN)
(~3,0 m.y.)
= upper late Serravallian + early-middle Tortonian
= late Bessarabian + Chersonian + Maeotian
A = 208a / 18,3
B = 208b,c / 20,0
C = 210a / 53,3
D = 212 / 30,0
E = 210b / 33,3
F = 209c / 10,0
G = 224a / 16,7
H = 224a1 / 30,0
I = 226 / 33,3
J = 224b1 / 16,7
K = 224c / 16,7
L = 223c / 10,0
M = 218a / 10,0
LONDON
PARIS
BORDEAUX
MONTPELLIER
MARSEILLE
BARCELONA
MADRID
VALENCIA
LISBOA
SEVILLA
RABAT
ALGER
TUNIS
TRIPOLI
BENGHAZI
TUBRUQ
CAIRO
BERN
MÜNCHEN
MILANO
ROMA
PALERMO
PRAHA
BRNO
WIEN
BUDAPEST
ZAGREB
BEOGRAD
BUCURESTI
SOFIA
ISTANBUL
ATHENS
IZMIR
ANKARA
ADANA
DAMASCUS
TEL-AVIV
KRAKOW
LVOV
KIYEV
ODESSA
KHERSON
TAMBOV
VOLGOGRAD
TBILISI
YEREVAN
ERZURUM
TEHERAN
BAGHDAD
KUWAIT
CHIMKENT
SAMARKAND
KABUL
KARACHI
0 250 500 km
226= / 37,5 No. of the sedimentation area (see Steininger-Seneš-Kleemann-Rögl: IGCP 25, Final Report, Vol. II Vienna, 1985) and sedimentation rates in cm / 1000y
= northern and southern limits of the Tethys and Paratethys Neogene.


9
Neogene of the Mediterranean Tethys and Paratethys
SEDIMENTATION RATES
(cm / 1000y)
PONTIAN
(~ 3,0 m.y.)
= middle - late TORTONIAN + early MESSINIAN
= ± PONTIAN (of the Eastern Paratethys)
A = 224a / 16,7
B = 224a1 / 83,3
C = 223a / 33,3
D = 223b / 66,7
E = 223c / 50,0
F = 218a1 / 10,0
226 = No. of the sedimentation area (see Steininger-Seneš-Kleemann-Rögl: IGCP 25, Final Report, Vol. II Vienna, 1985) and sedimentation rates in cm / 1000y
37,5
= northern and southern limits of the Tethys and Paratethys Neogene.
0 250 500 km
LONDON
PARIS
PRAHA
KRAKOW
LVOV
KIYEV
BRNO
WIEN
MUNCHEN
BERN
MILANO
BUDAPEST
ZAGREB
BEOGRAD
BUCURESTI
JASI
ODESSA
KHERSON
TAMBOV
VOLGOGRAD
BORDEAUX
MONTPELLIER
MARSEILLE
BARCELONA
MADRID
VALENCIA
LISBOA
SEVILLA
ALGER
TUNIS
PALERMO
ROMA
SOFIA
ISTANBUL
ATHENS
IZMIR
ANKARA
ADANA
ERZURUM
TBILISI
YEREVAN
TEHERAN
CHIMKENT
SAMARKAND
KABUL
BAGHDAD
DAMASCUS
TEL-AVIV
KUWAIT
KARACHI
CAIRO
TUBRUQ
BENGHAZI
TRIPOLI
RABAT
210a 66,7
212 20,0
209c 10,0
215 20,0
216a 10,0
205f 40,0
206a 16,7
205g 20,0
220 26,7
224b1 16,7
226 66,7
227 33,3
225 26,7
233a 23,3
229b 33,3
235a 10,0
34 10,0
248 10,0
249 26,7
252 33,3
251 45,0
258 13,3
253 16,7
280b 20,0


10
Neogene of the Mediterranean Tethys and Paratethys
SEDIMENTATION RATES (cm/1000 y)
MESSINIAN (~ 1,0 m.y.)
= late Pontian ± early Dacian
= late Pontian ± early Kimmerian
LONDON
PARIS
BORDEAUX
MONTPELLIER
MARSEILLE
BARCELONA
MADRID
VALENCIA
LISBOA
SEVILLA
RABAT
ALGER
TUNIS
TRIPOLI
BENGHAZI
TUBRUQ
CAIRO
TEL-AVIV
DAMASCUS
ADANA
ANKARA
IZMIR
ATHENS
ISTANBUL
SOFIA
BUCURESTI
BEOGRAD
ZAGREB
BUDAPEST
WIEN
BRNO
PRAHA
KRAKOW
LVOV
KIYEV
JASI
ODESSA
KHERSON
TAMBOV
VOLGOGRAD
TBILISI
YEREVAN
ERZURUM
TEHERAN
BAGHDAD
KUWAIT
KARACHI
KABUL
SAMARKAND
CHIMKENT
BERN
MÜNCHEN
MILANO
ROMA
PALERMO
0 250 500 km
226 = No. of the sedimentation area (see Steininger-Seneš-Kleemann-Rögl: IGCP 25, Final Report, Vol. II Vienna, 1985) and sedimentation rates in cm/1000 y
37,5
= northern and southern limits of the Tethys and Paratethys Neogene.


11
Neogene of the Mediterranean Tethys and Paratethys
SEDIMENTATION RATES (cm / 1000 y)
ZANCLEAN (Z=2,0 m.y.)
PIACENZIAN (P=1,6 m.y.)
Z+P=PLIOCENE (ZP=3,6 m.y.)
DACIAN (D=2,2 m.y.)
ROMANIAN (R=1,8 m.y.)
D+R=⊕ PLIOCENE (DR=4,0 m.y.)
KIMMERIAN (K=2,4 m.y.)
AKTCHAGYLIAN (A=1,6 m.y.)
K+A=⊙ PLIOCENE (KA=4,0 m.y.)
226= No. of the sedimentation area (see Steininger-Seneš-Kleemann-Rögl: IGCP 25, Final Report, Vol. II Vienna, 1985) and sedimentation rates in cm/1000y
37,5
= northern and southern limits of the Tethys and Paratethys Neogene.
0 250 500 km
LONDON
PARIS
PRAHA
BRNO
KRAKOW
LVOV
KIYEV
TAMBOV
VOLGOGRAD
MÜNCHEN
WIEN
BERN
BUDAPEST
MILANO
ZAGREB
BEOGRAD
JASI
ODESSA
KHERSON
BORDEAUX
MONTPELLIER
MARSEILLE
BUCURESTI
SOFIA
ROMA
BARCELONA
ISTANBUL
MADRID
TBILISI
YEREVAN
ERZURUM
ANKARA
VALENCIA
LISBOA
SEVILLA
PALERMO
ATHENS
IZMIR
ADANA
ALGER
TUNIS
TEHERAN
CHIMKENT
SAMARKAND
KABUL
RABAT
TRIPOLI
BENGHAZI
TUBRUQ
DAMASCUS
BAGHDAD
TEL-AVIV
CAIRO
KUWAIT
KARACHI
224c 35,0DR
224a 45,0DR
220 27,5DR
224b1 25,0DR
17d3 62,5P
223b 37,5DR
205f 195,0DR
205g 30,0DR
223c 25,0DR
226 35,0DR
18b 41,7ZP
17d 1,2 27,8ZP
14a 27,8ZP
28 25,0Z
206a 23,0DR
20a 50,0Z
18a3 75,0Z
23 27,8ZP
50c 61,0ZP
249 32,5KA
252 42,5KA
255 43,8A
257 104,2K
251 20,8K
258 83,3K
256a 62,5A
280b 80,0KA
259 57,5KA
253 31,3A
256b 57,5KA
58a 30,6ZP
58d 47,2ZP
60b,d 15,0Z
70a 30,6ZP
2b 50,0Z
27c 37,5Z
42ab 27,8ZP
64c2 20,0Z
110,111 27,8ZP
106d,g 50,0Z
96b 45,0Z
151 41,7ZP
355 27,8ZP
75a 55,6ZP
353 27,8ZP
82a12 63,9ZP
81a5 27,8ZP
78 55,6ZP


12
Neogene of the Mediterranean Tethys and Paratethys
THICKNES
and
SEDIMENTATION RATES
of the
NEOGENE
(± 23,6 - 1,8 m.y.)
~ 22 cm / 1000 y
4000 - 5000 m
~ 32 cm / 1000 y
5000 - 7000 m
~ 45 cm / 1000 y
7000 - 10.000 m
LONDON
PARIS
PRAHA
BRNO
KRAKOW
LVOV
KIYEV
TAMBOV
VOLGOGRAD
204a3
205c3-5
205d
215
210a,b
212
213c
216a
208a1,2, 208b
WIEN
MÜNCHEN
BUDAPEST
220
224a1
226
ZAGREB
BERN
200b
MILANO
17d3
JASI
205f
206a
ODESSA
KHERSON
247
249
255
251
TBILISI
258
252
280b
BEOGRAD
BUCURESTI
SOFIA
ISTANBUL
50c
ANKARA
ERZURUM
YEREVAN
253
CHIMKENT
SAMARKAND
BORDEAUX
MONTPELLIER
MARSEILLE
ROMA
BARCELONA
MADRID
VALENCIA
LISBOA
SEVILLA
PALERMO
ATHENS
IZMIR
ADANA
TUNIS
ALGER
106g
RABAT
TRIPOLI
BENGHAZI
TUBRUQ
CAIRO
DAMASCUS
TEL-AVIV
BAGHDAD
359
356
TEHERAN
360
KUWAIT
KABUL
364
362
KARACHI
0 250 500 km
226= No. of the sedimentation area (see Steininger-Seneš-Kleemann-Rögl: IGCP 25, Final Report, Vol. II Vienna, 1985).
= northern and southern limits of the Tethys and Paratethys Neogene.

References

Berggren, W. A., Kent, D. W., Flynn, J. J. and Couvering, J. A. 1985: Cenozoic geochronology. *Geol. Soc. Amer. Bull., 96, 1 407—1 418.*

Brambati, A. and Venzo, G. A. 1967: Recent sedimentation in the Northern Adriatic Sea between Venice and Trieste. *Studi Trentini Sci. Nat., 44, 202—247.*

Füchtbauer, H. and Reineck, H. E. 1963: Porosität und Verdichtung rezenter, mariner Sedimente. *Sedimentology, 2, 294—306.*

Goldberg, E. D. and Koide, M. 1962: Geochronological studies of deep sea sediments by ionium-thorium method. *Geochim. Cosmochim. Acta., 26, 417—450.*

Information Bulletin IGCP Project No. 25, 1975—1979: *No. 1—6, Edit. Geol. Inst. Slov. Acad. Sc. Bratislava.*

Kukal, Z. 1964: Geologie recentních sedimentů. *Praha, ČSAV, 441 p.*

Menning, M. 1989: A Synopsis of Numerical Time Scales 1917—1986. *Episodes, 12, 1, 3—5.*

Moore, D. G. 1962: Bearing strength and other physical properties of some shallow and deep-sea sediments from the north Pacific. *Bull. Geol. Soc. Amer., 73, 1 163—1 166.*

Nevesskaya, L. A. 1984: Regionalnaya stratigraficheskaya skala neogena Vostochnogo Paratethisa. *Sov. Geol., 9, 37—49.*

Paul, J. 1970: Sedimentologische Untersuchungen im Limski kanal und vor der istrischen Küste (nördliche Adria). *Göttinger Arb. Geol. Paläont. 7, 1—75.*

Reineck, H. E. 1960: Über Zeitlücken in rezenten Flachseesedimenten. *Geol. Rundsch., 49, 149—161.*

Rögl, F. and Steininger, F. F. 1983: Vom Zerfall der Tethys zu Mediterran und Paratethys. Die neogene Paläogeographie und Palinspastic des zirkum — mediterranen Raumes. *Ann. Naturhist. Mus. Wien, 85/A, 135—163.*

Semenenko, V. N. 1987: Stratigrafischeskaya korelatsya verkhnego miocena i pliocena Vostognogo Paratetisa i Tetisa. *Naukova Dumka, 87, 232 p.*

Seneš, J. 1985: Stratigraphic correlation Tethys-Paratethys Neogene, IGCP Project No. 25. History and aims, organization and results. *Geol. Zbor. Geol. Carpath., 36, 6, 725—746.*

Seneš, J. 1987: Application of results of the International Geological Correlation Programme, Project No. 25. *Geol. Práce, Správy, 87, 113—136.*

Seneš, J. 1989: Introduction and revaluated chronostratigraphic range of regional litho- and biostratigraphic units of the Mediterranean Tethys and Paratethys Neogene; application of results of the IGCP No. 25; part 1. *Mineralia slov., 21, 109—121.*

Steininger, F., Seneš, J., Kleemann, K. and Rögl, F. 1985: Neogene of the Mediterranean Tethys and Paratethys. *Univ. Press Vienna, I., p. 189, II., p. 536.*

Van Straaten, L. M. J. U. 1965: Sedimentation in the North-Western part of the Adriatic Sea. *Colston papers, 17, 143—162.*

Vass, D. and Čech, F. 1983: Sedimentation rates in Molasse Basins of the Western Carpathians. *Geol. Zbor. Geol. Carpath., 34, 4, 411—422.*

Vass, D., Repčok, I., Balogh, K. and Halmai, J. 1987: Revised radiometric time-scale for the Central Paratethyan Neogene. *Ann. Inst. Geol. Publ. Hung., 70, 423—434.*

Veľké mocnosti a vysoké hodnoty rýchlosti sedimentácie neogénu cirkummediteránnej oblasti; aplikácia výsledkov projektu IGCP č. 25; časť 4

Enormné mocnosti neogénu, zistené v poslednom polstoročí hlavne hlbokými vrtmi, právom inšpirujú mnohých geológov k modernejším paleogeografickým a geodynamickým úvahám. Domnievame sa, že zdetailizovanie údajov s vysokými mocnosťami a rýchlostnými koeficientmi sedimentácie poslúži na rekonštruovanie mobility mnohých oblastí s veľkými subsidenciami a emergenciami.

Aj v tomto príspevku používame pri hodnotení základné údaje z Final Report IGCP projektu č. 25, ktorý poskytuje moderné stratigrafické spracovanie tohto rozsiahleho interkontinentálneho areálu.

So súčasnými názormi na koreláciu regionálnych chronostratigrafických jednotiek (stupňov) neogénu a s mapou geografického rozšírenia a číslovania sedimentačných priestorov sa čitateľ môže oboznámiť v práci Seneša (1989). Je samozrejmé, že pri absolútnom datovaní hraníc stupňov nemôžeme vylúčiť určitú toleranciu, ktorá môže ovplyvniť presnosť výpočtov rýchlosti sedimentácie. Tie mohli byť pôvodne podstatne vyššie aj z dôvodov, že v rámci uvedených časových jednotiek mali buď oneskorený transgresívny charakter, vykazujú často angulárne diskordancie, alebo boli vo svojej terminálnej časti denudované. Merateľné sú len dnes existujúce mocnosti vrstiev, ktoré predstavujú väčšinou len relikt. Nemenej dôležité je aj diagenetické stenčenie pôvodných mocností predovšetkým pelitických sedimentov, hlavne starších než 10—15 my, pokrytých aj tisíce metrov mocným mladším vrchným miocénom a pliocénom.

Pri tabelárnom a mapovom zostavení uvádzame len vysoké hodnoty mocnosti: pri krátkych časových úsekoch nad 200—300 m, pri dlhšie trvajúcich nad 600—1 000 m. V tabelárnych zostavách uvádzame aj skratky vyjadrujúce dôvody nutných pozitívnych korekcií spôsobených prípadnou diagenézou, angulárnymi diskordanciami, transgresívnym charakterom sedimentácie alebo hiátmi spôsobenými denudáciami; ďalej skratky litologického vývoja súvrství a charakter prostredia ich vzniku. V súlade s tabuľkami sú na mapových prílohách vyznačené tiež len oblasti s vysokými hodnotami sedimentácie. Preto zdôrazňujeme, že to nie sú paleogeografické mapy znázorňujúce navzájom spojené morské alebo limnické oblasti.

Rýchlosť sedimentácie v recentných moriach a na kontinentoch v porovnaní s neogénom bola lokálne vysoká. Preto hodnoty sedimentácie vyčíslené v marinnom prostredí neogénu svedčia o značnej členitosti reliéfu, o sedimentácii väčšinou skôr v plytšom, ale už kľudnejšom otvorenom šelfovo-litorálnom než v batyálnom prostredí. V mnohých, paleogeograficky zrejme členitých oblastiach predpokladáme zvlášť v skoršom a strednom miocéne značné výzdvihy a denudáciu s vysokým transportom riečnych sietí jednak z mobilných mladých orogénnych oblastí, ale aj z konsolidovaných platforiem z okrajových častí cirkummediteránu. Táto vysoká sedimentácia sa nevzťahuje na brachyhalinné až vysladené, geograficky rozsiahle jazerá vrchného miocénu a pliocénu hlavne paratetýdnej oblasti. V nich panovali väčšinou rovnaké podmienky ako v súčasných vysladených vnútorných moriach Eurazie.

Ak sa nám na základe súčasných poznatkov podarí znázorňovať intenzitu orogénov v čase a priestore aj graficky a syntetizovať ju s rámcovými údajmi tohto príspevku, budeme môcť nesporne už podrobnejšie a presnejšie pristúpiť k rozlúšteniu časových vzťahov vývoja mnohých neogénnych panví a k zisteniu mobility mladých pásmových pohorí Európy a západnej Ázie.