

# Jeoloji Panorama

**Hazırlayan: Sefer Örcen** MTA Genel Müdürlüğü, Jeoloji Etüdları Dairesi, Ankara

"Jeoloji Panorama"da dünya jeoloji periyodiklerinden özellikle lakemizin jeolojisini ilgilendiren yada ilginç olabilecek,, seçilmiş makalelerin bibliyografyası "Dünya Periyodiklerinden Makaleler" başlığı altında "Jeoloji Mühendisliği" okurlarına sunulacaktır.

Türkiye jeolojisi üzerine yazılmış seçilmiş makalelere ait "Özler / Abstracts" bölümü özgün şekilleri de kapsar biçimde "Jeoloji Panorama" da yer alacaktır.

Yapılacak yada yapılmış olan sempozyum, seminer, konferans vb., ye ait duyuru ve haberler de "Sempozyum, Seminer, Konferans" başlığı altında okurlara sunulacaktır.

Diğer yandan jeoloji mühendislerinin mesleki gelişimlerine katkı sağlayacağı düşüncesiyle güncelliğini de on planda tutarak "Yeni Yayınlar" in tamamına- da "Jeoloji Panorama" da yer verilecektir:

Her zaman olduğu gibi ""Jeoloji Takvimi", çeşitli dünya ülkelerinde yapılacak olan jeoloji etkinliklerinin bir ay-nası olarak okurlara yansıtılacaktır.

Çizilen çerçeve içinde "Jeoloji Panorama" 'yer bilimcilerin çeşitli jeoloji disiplinlerine ai\$ üretimlerinin sergilenildiği bir platform olarak nitelendirilebilir.

"Jeoloji Mühendisliği" okurları da, ""Jeoloji Panom-ma"ya yakardaki konulara- ilişkin hazırlayacakları ha-ber ve tanıtım yazılan ile katkı da bulunabilirler.

## Dünya Periyodiklerinden. Makaleler

• "Geological Magazine" 1995,, cilt, 132, no. 1 -5

5 sayı içinde özellikle ülkemizin jeolojisini ilgilendiren yada ilginç olan makaleler:

132/1, Ocak; 1995:

Fortey, R.A., Harper, D.A.T., Ingham, J.K., Owen, A.W. and Rusitoo, A.W.A., 1995, A revision of Ordovician series and stages from the historical type arex Geological Magazine, 132,1,15 - 30.

132/2, Mart 1995:

Oliver, G.J.H., Johnson, M.J.R.W. and Fallick, A.E., 1995, Age of metamorphism in the Lesser Himalaya and

the Main Central Thrust zone, Caarhwal India: results of Hüte crystallinity, <sup>40</sup>Ar-<sup>30</sup>Ar fusion and K-Ar studies: Geological Magazine, 132,2,, 139 -149.

132/3,, Mayıs, 1995:

Bozkurt, E., Winchester, J.A. and Park, R.G., 1995, Geochemistry and tectonic significance of augen gneisses from the Southern Menderes Massif (West Turkey); Geological Magazine, 132,, 3,, 287 - 301.

Griand, B., Bouchardon, J.L., Ouali, H., Kboüle, M., and Capter, P., 1995,, Geochemistry of bimodal and Mbo-liic -felsic gneiss complexes from eastern Massif central, France: Geological Magazine, 132,, 3,321 - 337.,

132/4, Temmuz, 1995:

Hamdi, B., Rozanov, A.Yo. and Zhiirawlev, A. Ye., 1995, Latest Middle Cambrian mefazoan reef from northern Iran: Geological Magazine,, 132,4,367 - 373.,

Segev, A., Hali.cz, L., Steinitz, G. and Gang,, B., 1995, Post - depositional processes on a buried Cambrian sequence in southern israil,, north Arabian Massif: evidence from - new K-Ar dating of Mn-noduies: Geological Magazine, 132,4, 375 - 385. '

132/5, Eylül 1995:

Kimbell, G.J. and Stone, P., 1995, Crustal magnetization variations across the lapetus suture zone: Geological Magazine, 132,5,599-609.

"Tectonophysics" 1995

241/no., 1-2:

Pedcock, D.C.P. and Sanderson, D.i., Pull - apatts, shear fractures and pressure solution , 1 - 14.

Guilot, S., Le Fort, A., Pécher, A., Barman, M.R. and Aprahamian, L, Contact metamorphism and dept of emplacement of the Munaslu granite (Central Nopal). Implications for Himalayan orogenesis, 99 -120.

24 I/no. 3-4:

Berberian, M., Master 'blind'\* thrusts faults hidden under the Zagros folds: active basement tectonics and surface morphotectonics; .193 - 224.

243/ no. 3-4:

Genç, Ş.C. and Yılmaz, Y., Evolution of the Triassic continental margin northwest Anatolia, 193 - 207..

Yılmaz, Y., Genç, Ş.C., Yiğitbaş, E., Bozcu, M., and Yılmaz, K., *Geological evolution of the late Mesozoic continental margin of Northwestern Anatolia*» 155 - 171,

244/no. 1 - 3:

Special. Issue: *Heat flow and thermal regimes of continental lithosphere.*

Cennak, V., and Bodri, L., *Three -dimensional deep temperature modelling along the European geotraverse*, 1-12.

Cermak, V., *A geothermml model of the Central segment of the European Geotraverse*, 51 - 56.

Hella Vedova, B., Lucuzcau, F., Pascuale, V., Pelin, G. and Verdoya, M., *Heat flow in the tectonic provinces crossed by the southern segment of the European Geotraverse*, 57 - 74..

Hurtig, E., *Temperature and heat -flow density along European transcontinental profiles*, 75 - 84..

Vasseur, G., Brigand, F. and Demongodin, L., *Thermal conductivity estimation in sedimentary basins.*, 167 - 174.

tıkışık, Ö.M., *Regional heat flow in western Anatolian using silica temperature estimates from thermal springs*, 175 -184..

244/no, 4:

Wong, İLK., Ludmann, T., Uluğ, A. and Görür, N., *The sea of Marmara: a plate boundary sea in an escape tectonic regime.*, 231 - 250.

Tatar, O., Piper, J.D.A., Park, R.G. and Gürsoy, H., *Palaeomagnetic study of block rotations., in the Nizak overlap region of the North Anatolian Fault Zone, central Turkey*, 251 - 266.

249/DO. 1 - 2:

Kafile, H.G., Müller, M.V., Geiger, A., Danuser, G., Mueller, S., Vds., G., BiHns, H. and Pradissis, D., *The stain field in northwestern Greece and the Ionian islands: results inferred from GPS measurements*, 41 - 52.

250/no. 1 - 3:

Akıncı, A., Ibanez, X.M., del Pezzo, E. and Morales,, I., *Geometrical spreading and atenuation of Lg waves: a comparison between western Anatolia. (Turkey) and southern Spain*, 47 - 60.,

"Geology" Vol. 23.» 1994» 1.995

22/no. 3,1994

Okay, A.I., Şengor, A.M.C. and Görür, N., *Kinematic history of the opening of the Black Sea and its effect on the surrounding regions*, 267' - 270.

23/no, 2,1.995

Christopher, A., McRoberts, Cathryn R. Newton., *Selective extinction among end - Triassic Eorupian bivalves.*, 102 -1.04.

23/00. 3

John B. Ritter., Jerry R. Miller., Yehouda Enzel, Stephen G. Wells., *Reconciling the wies of tectonism and climate in Quaternary alluvial fan evolution*, 245 - 248.

C.,J, Macleod, B J. Morton., *On the sense of slip of the southern Troodos transform fault zone, Cyprus*, 257 - 260.

23/no. 4

Bruce P. Luyendyk, *Hypothesis for Cretaceous rifting of east Gondwana caused by subducted slap capture*, 373 - 376.

23/no. 5

•SA., Schurnm, David K, Rea, *Sediment yield front disturbed earth systems.*, 391 - 394.

23/110..5

Ralf Hetzet, Cees W. Passclüon, Uwe Riogs Özcan O. Dora, *B iver gent extension in orogenic belts: The Menderes massif (southwestern Turkey)*, 455 - 458. •

Scambelluri, M., Munteieir, O., Hermann, J., Piccardo,, G.B., Trommsdorff, V., *Subduction of water into the mantle: History of an Alpine peridotite.*, 459 - 462.

23/00. 6

Reiners, P.W., Nelson., R.K., GMorso, M.S., *Assimilation of felsic crust by basaltic magma: Thermal limity and extents of crustal contamination of mantle - desived magmas*, 563 - 566.

23/noJ

Beaton, M.J., Simins, MJ., *Testing the marine and continental fossil records*, 601 - 604,

23/m 8

McClay, K., Dooley, T., *Analogue models of pull - apart basins*, 711 - 714..

23/no. 11

Storti., F., McClay, K., *Influence of syntectonic sedimentation on t hurst wedges in analogue models*, 999 - 1002.

Gonzales-Gonorrino, G., Eyles, N., *Inverse relation between ice extent and the late Paleozoic glacial record of Gondwana*, 1015 -1018.

"Natni-e", dit 377,1995

377/28 September 1995

Storey., B.C., *The role of mantle plumes in continental breakup: case histories from Gondwana Land*, 301 - 308. ~

"Bulletin of Volcanology", Vol. 56,1995

56/no. 8

Sdiuamaeher, R., Schminche, H.U., *Models for the origin of 'accretinonary lapilli*, 626 - 639.

## Özler / Abstracts

Anna Farinacci, 1993, *Argolide (Grecia) e Bey Daglari (Turchia): un pretesto per l'utilizzazione delle fadec nella compressione delta teonica sinsedimentaria: Paleogeologia* 3,47 - 58, Roma. \*

*Argolid (Greece) and Bey Daglari (Turkey): a testing of fades in the understanding of synsedimentary tectonics»*

This paper<sup>1</sup> deals with the link between, sedimentary fades and subsidence in the Cretaceous limestones of the western and eastern ends of the Aegean Arc (Akros in Argolid and Bey Daglari in the Western Taurus). By means of a model of extensional tectonics, it has been possible to recognize the reason why the buildup of carbonate platforms was so active in these areas, since they were the products of sedimentation which subsided gradually in an unstable area. On the other hand, in the stable plateaux, active carbonate sedimentation was inhibited by negative subsidence, resulting from compressional tectonics in a strike-slip system. Consequently, there, the space necessary for deposition was not created by the weight of the sediments and sedimentary gaps were very frequent. On the non subsident plateaux, with little platform, benthos and with no carbonate buildup, only pelagic organisms were able to fix the carbonate portion of the sediment; here there is an increased clay: carbonate ratio, since the amount of carbonate being deposited was low. Because of the differentiation of a subsiding platform and of a stable plateau, which were in lateral contact, or which alternated; vertically, a deep-seated tectonics is believed to be responsible for the differing responses of subsidence to the sediment load. Moreover along, strike-slip faults and margins of half-grabens, materials from, carbonate platforms could have been, transported, to the stable plateaux, subsiding a little by drag from the subsiding area, where the carbonate platform was being built. Because of the biological progradation of the carbonate shelf towards the fore-reef and outer rim, that is along active marginal faults, unconsolidated shelf margin sediments collapsed due to tectonic pulses, and were thus moved to the transitional margin between the subsiding areas and the stable, plateaux, which, were subsiding only a little through drag, and whose marginal areas appeared to be more unstable than the internal ones. The trend of the tectonics can change a subsiding area to a stable one; after the Cenomanian active buildup, subsidence stopped at the beginning of the Turanian, and the carbonate platform of the Aegean Arc was subject to subaerial exposure. After karstification of the surface, sedimentation began again in the "scaglia" facies with globotruncanids during the

Turanian or later, into the Coniacian and Saitonian (thus the drawing was gradual and lasted between 2. and 6 million years, the sedimentary sequences having, moreover, many gaps and limited thickness). The succeeding Late Campanian - Maastrichtian succession, (that is, after about 15 million years from the cessation, of the carbonate buildup) happened, almost contemporaneously everywhere in the Aegean Arc in the "scaglia" facies with globotruncanids. This situation is common to Akros and Bey Daglari; except in the Susuz Dag succession (the south-western part, of the Bey Daglari), where, after sedimentation of the limestones in "scaglia" facies, the shelf buildup began again in the Maastrichtian, with transitional facies, along the main fault\*

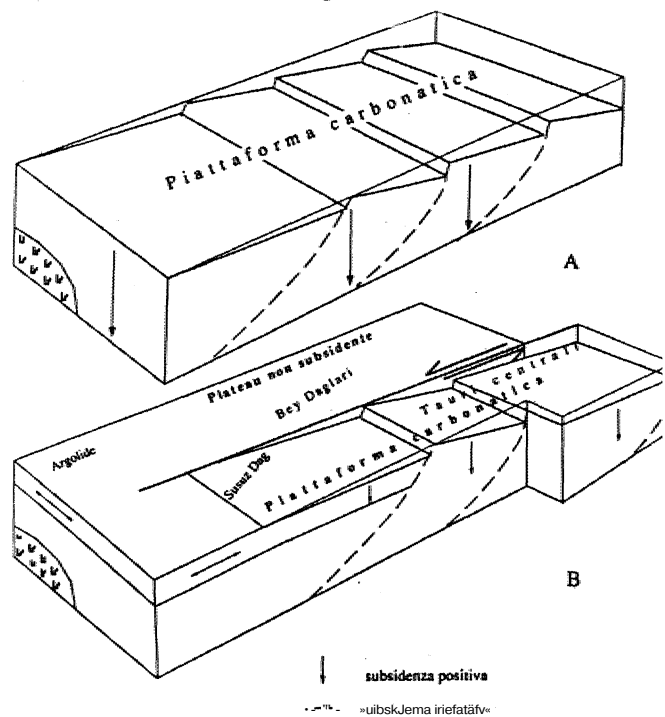


Fig. 3, A) Situazione tettonica con subsidenza positiva graduale durante il buildup carbonatico del Cenomaniano, estesa a tutte le unità geografiche dell'Arco Egeo, B) Situazione tettonica durante la transgressione tardo campaniano - maastrichtiano con le unità geografiche ubicate secondo le facies, e la subsidenza differenziata (vedi il testo).

AJL, Okay, A.M.C, Şengör, M, Görür, 1994, *Jö'ne-ümüc history of the opening of the Black Sea and its effect on the surrounding regions: Geology*, v. 22., p. 267 - 270, March 1994.

The Black Sea consists of two oceanic basins separated by the mid-Black Sea ridge. The east-west-oriented west Black Sea basin opened as a back-arc rift in the Cretaceous by tearing a Hercynian continental sliver, the Istanbul Zone, from the present-day Odessa shelf. The Istanbul zone, which was initially contiguous with the Moesian platform in the west, moved south during

the Late Cretaceous - Paleocene with respect to the Odessa shelf along two transform faults: the dextral west Black Sea and the sinistral west Crimean faults. It collided, in the early Eocene with a Cimmeride zone in the south,, there by ending the extension in the western Black Sea and deactivating both the west Black Sea and the west Crimean faults as strike - slip faults. The east Black Sea basin opened as a result of the counterclockwise rotation of an east Black Sea block around a rotation pole located north, of the Crimea,. This block, was bounded by the west Crimean fault, the southern margin of the eastern Black Sea,, and the southern frontal thrusts of the Greater Caucasus,. The rotation of the east Black Sea, and the southern frontal thrusts of the Greater Caucasus,.. The rotation of the east Black Sea block, was contemporaneous with the rifting of the west Black Sea basin but lasted until the Miocene, resulting in continuous compression along the Greater Caucasus.

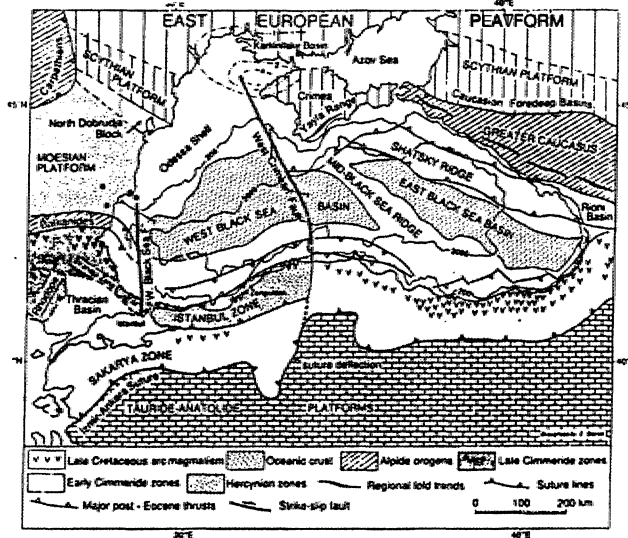


Fig. 1. Tectonic map of Black Sea region (Şengör u.d Yilmaz, 1981, tugolesov et al, 1985; Finetti et al., 1988; Okay,-1989). Bars across west Black Sea and west Crimean faults indicate locations of seismic sections in Daebev et al. (1988) and Finetti et al. (1988), respectively, which delineate these faults. Circles in southern part of Moesian platform indicate location of boreholes used for stratigraphy of Moesian platform (cf. Fig. 2). Contours north of Crimea give Upper Cretaceous - Lower Miocene sediments thicknesses in karhins sky basin (Vinogradou, 1966,, 1968). Depth contours in metres.

Ş.,C, Genç, Y., Yılmaz, 1995, *Evolution of the Triassic continental margin, northwest Anatolia; Tectonophysics*, 243,193 - 207

The northwest Anatolian basement consists, of two distinctly different metamorphic assemblages which were juxtaposed prior to the deposition of Liassic cover sediments\* These include the lower and the upper associations,. The lower association is mainly represented by Tri-

assic metavolcanic and associated metasedimentary units, together with a slice of ophiolite. The upper association rests on the lower association with a low - angle thrust, fault and is composed of Paleozoic or older schists, gneisses and phyllites. A transgressive succession begins, above the basement with Permo - Carboniferous neritic limestones. These platform type carbonates were disrupted by rifting during the early Triassic. At the initial phase of rifting, coarse elastics and associated rift type lavas were formed. The rift then, evolved into an ocean basin,, which closed, at the end of the Triassic. The continental margin of the Triassic basin underwent regional, metamorphism, initially high T/low P, it was followed, later by a high P/low T metamorphic phase. During the metamorphism, the continental margin units were multiply deformed by north - directed compressive stress. Later on, unmetamorphosed Triassic successions of the continental margin were thrust northward onto the metamorphosed part of the same continental margin,. Thus the Triassic assemblages of northwest Anatolia, collectively display the dynamics and various structural affects of the deformation recorded, in the continental margin and adjacent oceanic unit.,

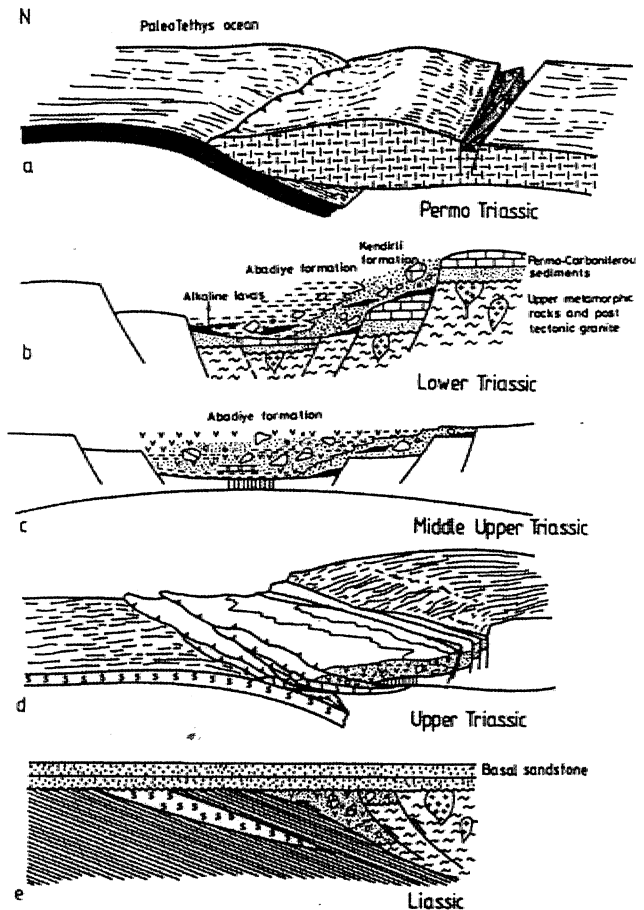


Fig. 11. Diagram showing consecutive stages of development of the Triassic basin in northwest Anatolia.

Y., Yılmaz, Ş.C., Genç, E., Yiğitbaş, M., Bozca, K., Yılmaz, 1995, *Geological evolution of the late Mesozoic continental margin of Northwestern Anatolia: Tectonophysics*, 243» 155 - 171.

The Armutlu peninsula is a composite tectonic entity made up of sections, of the Sakarya continent, the Rhodope - Pontide fragment and an ophiolite. These are assembled following a continental collision between Gondwanaland and Laurasia during the Late Cretaceous. The northern margin of the Sakarya continent underwent progressively increasing deformation prior to and during the advancing collision, due to continued convergence between the two continents. Initially, the leading edge of the continent, subsided under the load of an approaching ophiolitic slab. Following this, a north - directed thrusting and folding occurred during the Turanian. Progressive elimination and eventual closure of the ocean preceded the thrusting of northerly situated, collision - induced, nappe packages, over the leading, edge - of - the - Sakarya continent. The nappe - laden edge of the continental margin then collapsed and steadily subsided under the heavy load of the ophiolitic slab and the northern continental fragment. Consequently, the nappe packages and the ophiolite were collectively metamorphosed during the Coniacian - Santonian interval. During the Subsidence the main body of the Sakarya continent partially detached from its collapsed, edge along a fault zone - and thus suffered an independent but less severe deformation, which lasted, until the uplift of the collapsed edge in the Campanian. From the late Campanian onward throughout later orogenic stages, the metamorphic and non - metamorphic units amalgamated into a single tectonic entity, forming a basement for younger cover rocks (Fig. 9).

Aral, L, Okay, Helfried, Mostler, 1994, *Carboniferous and Permian Radiolarite Blocks from the Karakaya Complex in Northwest Turkey*; Tr. J. of Earth Sciences 3, 23 - 28» TÜBİTAK...

The Karakaya Complex, is a strongly deformed, partially metamorphosed, heterogeneous assemblage of Permian - Triassic clastic, volcanoclastic, and basic volcanic rocks with wide outcrops in the Sakarya Zone of the Pontides. Here, we report for the first time, Upper Paleozoic pelagic sediments found as exotic blocks in the Karakaya Complex in the Biga Peninsula of northwestern Turkey. One such block occurs in the sandstones of the Hodul Unit of the Karakaya Complex northeast of Balya. It is a two - meter - large block made up of intercalated, thinly bedded red limestone and radiolarian chert. A sample from the limestone has yielded Bashkirian (Middle Carboniferous) conodonts. Blocks of radiolarian chert, also occur in the siliceous shales of the Çal Unit of the Karakaya Complex southeast of Çan, A

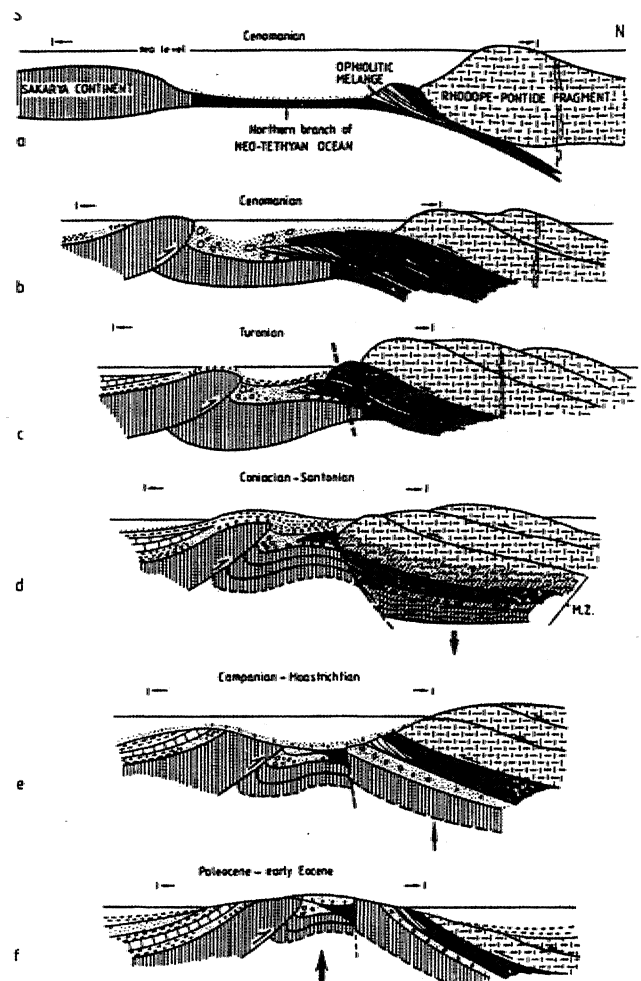


Fig. 9. Plate tectonic model displaying subsequent stages of the evolution and foreland deformation of the region during the Late Cretaceous and early Tertiary. The horizontal arrows indicate the limits of the region corresponding to the study area. (a) The north - facing continental margin formed during the Mesozoic and persisted until the Late Cretaceous. The northern continent, which at present corresponds to the western Pontides (the Rhodope - Pontide fragment), comprised the southern part of Laurasia. The southern continent (the Sakarya continent) represented a fragment of Gondwanaland. The ocean that separated the two continents is known as the northern branch of the Neo-Tethyan ocean. The ocean floor began to be consumed, possibly by northward subduction under the Rhodope-Pontide fragment, (b) An ophiolitic slab detached from its root and began to move southwards toward the Sakarya continent, possibly during the Cenomanian. In front of the ophiolitic slab a foredeep and an accompanying thrust-induced forebulge formed on the edge of the Sakarya continent. The forebulge reached above sea level and was deeply eroded. Materials derived from the elevated region were then transported into adjacent structural lows as debris flows and blocks. This may have coincided with the initial phase of continental collision, as a result of elimination of the ocean floor which left behind a remnant sea. After the Cenomanian no more abyssal plain sediments were formed. Intense simultaneous tectonic activity is recorded on both continents as thrusting and tight folding, (c) Progressive stacking of the nappes transported southwards created a heavy burden on the edge of the foreland of the Sakarya continent. As a result of the increasing load, the edge of the continent is assumed to have collapsed and subsided. The broken line indicates a hypothetical fault along which the loaded edge of the continent began to subside.

(d) The collapsed edge of the Sakarya continent, the overlying slab of the ophiolite and the Rhodope - Pontide fragment were collectively buried and metamorphosed. M.Z. = the metamorphosed zone; thick arrow = subsidence; (e) The metamorphosed nappe stack rose rapidly before the late Campanian. Broken line = a hypothetical, fault zone, which facilitated the uplift of the collapsed and metamorphosed units; arrow = the uplift. Following the uplift, the southern, central and the northern zones were collectively covered, for the first time under a common sea where a wide range of coeval sedimentary rocks were deposited. From the north to the south, transitions from fluvial to shallow marine environments passing into a deeper marine flysch basin are recorded in the Upper Campanian - Maastrichtian successions (see FL 8) (f) As a result of continued convergence the flysch basin was gradually elevated and finally rose above the sea. However, in the interior of both continents the sea realms remained, until the end of the early Eocene. The arrow indicates thickening, shortening and consequent uplift of the central sector due to north - south compression.

sample from the **ladiolarian** chert has yielded Sakmarian to Artioskian (Lower Permian) radiolaria. The discovery of Upper Paleozoic pelagic sediments in the Karakaya Complex indicates that the Karakaya Complex does not represent Triassic rift deposits as generally believed, but probably represents active margin units of Permian - Triassic age and includes possible oceanic accretionary material as old as Carboniferous.

M., Görür, A.L., Okay., (X, Tüysüz, E\*, Yiğitbaş, R., Akkök, 1995, *İstanbul - Zonguldak Permian ve karbonifer istifi nin paleoçöğrümik ve tektonik konumu: Zonguldak Havzası Amşınım. Kuyuları -1: Kozlu - K20/G.* M.N. Yalçın, ve G. Gürdal (Der.) TÜBİTAK, MAM, Özel Yayımı, 27 - 43, 1995.

Batı Pontidlerde, İstanbul ve Zonguldak arasındaki Karbonifer kayaları,, İstanbul Zonu olarak bilinen Hersiniyen kıta. parçası üzerinde yer alır. Batıda,, İstanbul ve dolayında,, Karbonifer istifinin tabanında Üst Devoniyen yaşlı çörtlü ve nodüler kireçtaşları bulunur. Bunlar üste doğru Vizeen yaşlı, fosfat yumrulu, şeyi arakalmanii, radyolaryalı çörtlere geçer. Derin: denizel nitelikli bu kesimin üzerine de grovak, siltaşı ve şeyi aradlanmasından oluşan kalın bir türbidit istifi gelir. İstif Triyas yaşlı kırmızı kaba kırıntılılar tarafından, açıl. diskordansla örtülür. Zonguldak, dolayında ise Karbonifer istifi. Üst Devoniyen resifal kireçtaşlarının üzerinde yer alan şeyi arakatmanlı Vizeen kireçtaşları ile başlar. Vizeen kireçtaşları üzerine yaygın kömür yatakları içeren kırıntılı. Namuriyen - Vestfaliyen istifi, gelir. İstanbul - Zonguldak arasındaki alanda Karbonifer kayaları, Ordovisiyen - Karbonifer döneminde gelişmiş, kalın bir pasif kıta kenarı istifi içinde yer alır. Bu birlik kendisine komşu olan diğer tektonik birliklerde yer alan Paleozoik yaşlı istiflerden, belirgin, farklılıklar sunar. Buna karşılık Moesya platformu ile yakın benzerlikleri vardır. Karadeniz ve çevreleyen alanlardan elde edilen jeoloji, jeofizik, ve jeomorfolojik veriler, İstanbul Zonu'nun Karbonifer döneminde Odesa şelfi boyunca Moesya Platformu ve Kırım arasında yer aldığını gös-

termektedir. İstanbul Zonu, bugünkü konumunu Albinyen - erken Eosen döneminde Balı Karadeniz havzasının gelişimi esnasında iki ana transform fayla kazanmıştır (Okay vd., 1994).

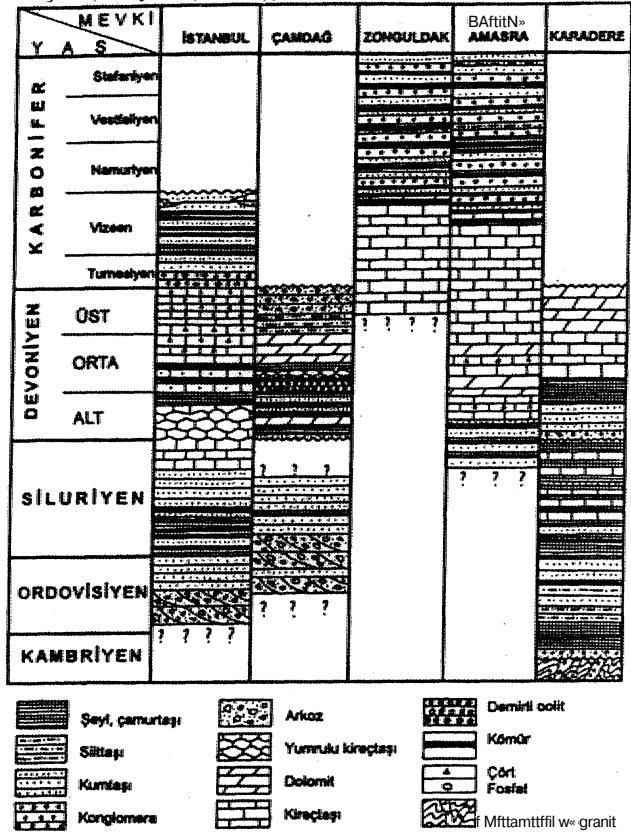


Fig. 3. Kuzey Anadolu'daki Paleozoik istiflerine ait stratigrafik kesitleri.

E. Bozkurt, J.A. Winchester and R.G. Fark, 1995, *Geochemistry and tectonic significance of augen gneisses from the Southern Menderes Massif (West Turkey)*; *Geological Magazine*, 132, 3, 287 - 301.

The protoliths of mylonitized augen gneisses exposed in the southern sector of the Menderes Massif (West Turkey) are calc-alkaline, peraluminous, S-type, late- to post-tectonic tourmaline- and garnet-bearing, two-mica leucogranites. They cut and post-date the fabrics of the "main Menderes metamorphism" which took place between the early Eocene and early Oligocene and intrude metamorphic basement rocks comprising the so-called Palaeozoic: schist envelope' of the massif. They are themselves cut by an extensive network of tourmaline-rich dykes. Chemical, mineralogical, isotopic and field relations suggest that, the granitic protolith crystallized from a boron-rich, water-saturated melt, derived from partial melting of metagreywacke in the lower crust during peak Barrovian-type metamorphism. The protolith was probably emplaced during late-orogenic extensional collapse of the thickened crust, in west Turkey during late Oligocene time.

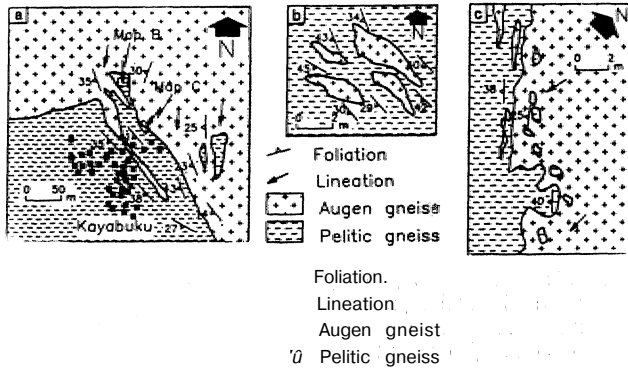


Fig. 10. (a) Large-scale detailed geological map at Kayabükü village showing the cross-cutting relationships between the augen gneisses and the fine-grained pelitic gneisses. Note the sill-like intrusion of granitic rocks into the host rocks. Locations of Figure 3b ve c are indicated; (b) detailed sketch map illustrating small scale on deformed granite veins within the pelitic gneisses; (c) detailed view of the boundary between the augen gneisses and the fine-grained pelitic gneisses. Both the granitic veins and the enclaves of schist are concentrated around the boundary (from Bozkurt, Park & Winchester, 1993).

OJM. tikişik, 1995» Regional heat flow in western Anatolia using silica temperature estimates from thermal springs; *Tectonophysics*, 244,1-3» 175 -184.

Regional trends of variation of heat flow in western Anatolia have been outlined, using the silica temperature estimator on thermal springs. Silica heat-flow values from 187 springs have been calculated. The data are corrected for local long-term mean annual surface temperature. A mean value of heat flow for the western part of Anatolia of  $107 \pm 45 \text{ mWm}^{-2}$  has been obtained, which is about 60% above the world average.

The silica heat-flow data are compared with available conventional heat-flow values for this region. A general agreement is observed, and new patterns are recognized. A close association exists between areas of high silica heat-flow values (above  $100 \text{ mWm}^{-2}$ ), and areas of Tertiary and younger volcanism. High heat flow is also ob-

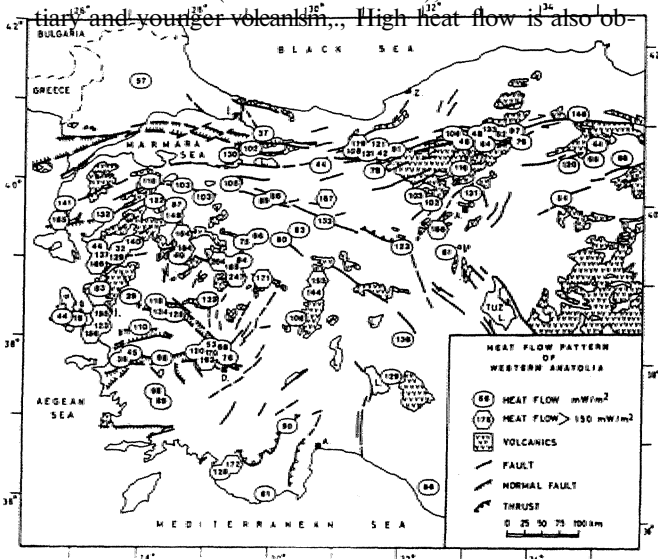


Fig. 2. Heat flow in western Anatolia from silica geotemperatures.

served in Palaeozoic, units of the Menderes Massif which is under tensional stress. The highest heat-flow estimate of  $247 \text{ mWm}^{-2}$  is obtained near Gediz ( $38^{\circ}57' \text{ N}$ ,  $29^{\circ}13.2' \text{ E}$ ). This area is part of a seismically active region and is located, near a Middle Eocene subduction zone which is an area, of later collision, tectonics.

The new heat-flow data from western Anatolia improve our knowledge of the thermal conditions within the crust. This information is important for the analysis of various geophysical and geological phenomena including seismically.

O. Tatar, J.D.A. Piper, R.G. Park and H. Gürsoy, 1995, *Palaeomagnetic study of block rotations in the Niksar overlap region of the North Anatolian Fault Zone. Central Turkey; Tectonophysics*, 244, 4, 251 - 266.

This palaeomagnetic study investigates crystal deformation within, and adjacent to, the Niksar overlap area of the North Anatolian Fault Zone (NAFZ) in central-east Turkey. The studied rock formations comprise: (1) red limestones, of Late Cretaceous age (3 sites); (2) mafic lavas of Eocene age on the north side (13 sites) and south side (9 sites) of the NAFZ; and (3) volcanic rocks of Pliocene - Quaternary age from the Niksar pull-apart basin within the NAFZ (8 sites). Comparisons with reference palaeofield directions computed from apparent polar wander paths of the Eurasian and Afro - Arabian plates identify two scales, of regional and local tectonic rotation:

(1) A pre-tilting remanence in the Eocene volcanic rocks south of the NAFZ ( $D/I = 144.1 / -47.5\%$   $\alpha_k = 7.6^\circ$ ) is interpreted to reflect counterclockwise rotation by  $30-40^\circ$  from the reference palaeofields. Contemporaneous volcanic rocks from the north side of the NAFZ have the same reverse polarity recorded in pre-tilting magnetisations. The remanence is also rotated counterclockwise ( $D/I = 152.4 / -42.5\%$   $\alpha_k = 11.3^\circ$ ), but by about  $8^\circ$  less than the volcanics on the south side of the NAFZ. Hence similar amounts of rotation are observed, on both sides of the NAFZ and are interpreted to reflect motions during the pre-Middle Miocene collisional history in this sector of the Pontides. No distributed clockwise rotation is observed from subsequent dextral motion along the NAFZ intracontinental transform. The slightly larger anticlockwise rotation found on the south side of the NAFZ probably records relative rotation of en-echelon wedges by continental escape during post-Middle Miocene strike slip along the transform.

(2) Within the narrow zone of intense deformation along the NAFZ, Cretaceous limestones appear to be rotated clockwise by dextral strike-slip motion whilst Pliocene - Quaternary lavas within a fault-bounded block in the overlap region associated with the Niksar pull-apart basin, have magnetisations consistently directed  $240 - 270^\circ \text{ E}$ . Magnetic inclinations are not diagnostic of polarity but both polarity solutions identify rapid, clockwise rotation at rates in excess of  $50^\circ/\text{m.y.}$  A normal polarity solution is favoured and implies that a block (ca. 5 km. across) has undergone a strike-slip displacement of

around 12. km. with the NAFZ during the last polarity chron. Cretaceous - Eocene palaeolatitudes are closer<sup>1</sup> to those predicted from Eurasia than Afro - Arabia, but a study of older rocks is required to resolve affinities of this, sector of the Anatolian block...

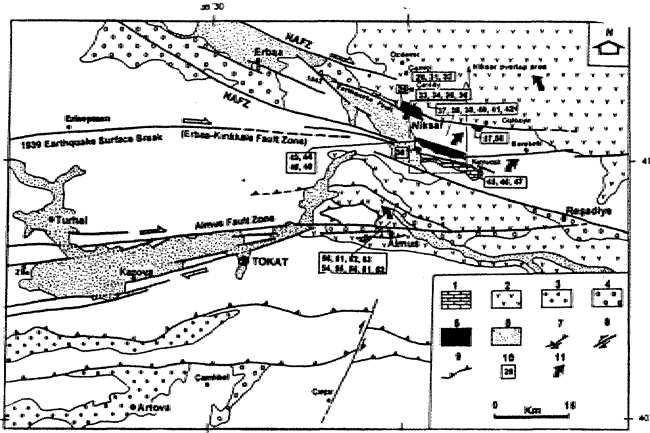


Fig. 2. Simplified geological map of the study area, showing sampling localities. The regional location is shown in Fig. 1. The inset legend: 1 = Upper Cretaceous red limestones; 2 = Eocene volcano - sedimentary units; 3 = Miocene - Pliocene deposits; 4 = Plk - Quaternary deposits; 5 = Plio - Quaternary volcanics; 6 = Quaternary deposits; 7 = transpressional fault with reverse component; 8 = strike - slip fault; 9 = thrust; 10 = sampling locations and numbers of site; 11 = sense of rotation.

## Sempozyum, Seminer, Konferans

### KARADENİZ' TEKNİK ÜNİVERSİTESİ MÜHENDİSLİK - MİMARLIK FAKÜLTESİ JEOLOJİ MÜHENDİSLİĞİ İÖLÜMÜNÜN 30. YIL SEMPOZYUMU

Karadeniz Teknik Üniversitesi, Mühendislik - Mimarlık Fakültesi, Jeoloji Mühendisliği Bölümünün (1965 - 1995) 30. yıl sempozyumu 16 - 20 Ekim 1995 tarihleri arasında Trabzon'da üniversite kampüsünde Jeoloji Mühendisliği Bölümü, tarafından gerçekleştirildi.

Sempozyumda Mineraloji - Petrografi, Maden. Yatakları - Jeokimya, Yapısal Jeoloji. - Tektonik, Mühendislik Jeolojisi, Paleontoloji, Hidrojeoloji, Sedimentoloji, Stratigrafi» Petrol Jeolojisi, Kömür Jeolojisi olmak 10 bölüm altında toplam 114 bildiri sunulmuştur., Syuulao bu bildirilere ait makaleler, düzenleme komitesi tarafından sempozyum bildiri kitabında yayınlanacaktır. Sempozyum bildiri özlere kitabında, yeralan bildirilerin başlıkları ve yazarları aşağıda, verilmiştir.

JEOLOJİ MÜHENDİSLİĞİ, Sayı48

### KARADENİZ TEKNİK ÜNİVERSİTESİ MÜHENDİSLİK-MİMARLIK FAKÜLTESİ



### JEOLOJİ MÜH. BÖLÜMÜ (1965-1995)

## 30. YIL SEMPOZYUMU

### BİLDİRİ ÖZLERİ

16-20 Ekim 1995

TRABZON

### İÇİNDEKİLER/Contents

#### MİNERALOJİ-PETROGRAFI / Mineralogy-Petrography

DERELİ BARİT YATAĞININ JEOLÖK VE PETROGRAFIK İNCELENMESİ Geologic and Petrographic Investigation of the Dereli Barite Deposit Mustafa ASLANER ve Özcan YİĞİT.....	2
İSCEHİSAR (AFYON) MERMERLERİNİN PETROGRAFIK VE BİOMEKANİK ÖZELLİKLERİ Petrographical and Geomechanical Properties of İscehisar (Afyon) Marbles Mesut AMİL, Alastin KILIÇ ve Sair KAHRAMAN.....	3
DOĞU PONTİDLER'DE ÇARPIŞMA SONRASI OLUŞAN SENOZOYİK YAŞLI PLÜTONİK VE VOLKANİK TOPLULUK The Post Collisional Cenozoic Plutonic and Volcanic Association of the Eastern Pontides Ali YILMAZ ve Nuri TERZİOĞLU.....	4
BEKİLLİ (DENİZLİ) - KARAHALLI (UŞAK) YÖRESİNDE YÜZEYLENEN BAŞKALAŞIM KAYAÇLARININ PETROGRAFIK ÖZELLİKLERİ Petrographical Features of the Metamorphic Rocks in the Bekilli (Denizli) Karahalli (Uşak) of the Surrounding Area Ali BİLGİN ve Yaşar KIBICI.....	5
ÖZDİL (YOMRA) GRANTİTOİD VE BUNA BAĞLI OLUŞAN DOKANAK METAMORFİZMASI Özül (Yomra) Granitoid and Related to Contact Metamorphism Zafer ASLAN ve M. Burhan SADIKLAR.....	6
DOĞU PONTİD METAMORFIK TABANINA İLİŞKİN YAŞ VE FASİYES VERİLERİNİN KİYASLANMASI. MAÇKA-ARSIN-ÇAYKARA (TRABZON) GÜNEYİ, KD TÜRKİYE The Comparison of Age and Facies Evidences Relating to the Eastern Pontide Metamorphic Basement, South of Maçka-Arsin-Çaykara (Trabzon), NE Türkiye. Salim GENÇ ve Balant YALÇINALP.....	7
TRABZON YÖRESİ LÖSİTLERİNİN PETROKİMYASAL ÖZELLİKLERİ Petrochemical Features of Leucites from the Trabzon Area Ali VAN, Cüneyt ŞEN, Bilent YALÇINALP ve Gültekin TOPUZ.....	8
ERMENEK (KONYA) NEOJEN HAVZASININ KİL MİNERALOGİSİ Clay Mineralogy of Neogene Basin of Ermenek (Konya) Necati KARAKAYA, Mustafa ÇELİK ve M. Tahir HALBANTÇILAR.....	9
SEYDİŞEHR-ARSEKI YÖRESİ BOKSİTLERİNİN MİNERALOJİK-KİMYASAL ÖZELLİKLERİ Mineralogic-Chemical Properties of Seydişehir-Arselik Bauxites A. Nurgün ERKAN ve Mustafa ÇELİK.....	10
KONYA BATI-GÜNEYBATISINDA KİL VE KİLDİŞİ MİNERALLEŞMELERİN ÖZELLİKLERİ Properties of Clay and Nooclay Mineralizations in West and Southwest of Konya Mustafa ÇELİK, Abdül TEMEL, ve Cemal TUNOĞLU.....	11
KARADAĞ-SIZMA (KONYA) YÖRESİNDEKİ MAFİSİT METAMORFİZMASININ KÖKENİ Origin of Bifasciated Metamorphism in the Karadağ-Sızma (Konya) Region Yüksel AYDIN.....	12
AKDAĞMADENİ (YOZGAT) METAMORFİTLERİNDE YERALAN ORTAKÖY GRANTİTOİDİNDEKİ KSENOLİTLERİN MİNERALOJİK VE PETROGRAFIK ÖZELLİKLERİ Mineralogical and Petrographical Features of Xenoliths of Orthopy Granitoid from Akdağmadeni (Yozgat) Metamorphites Mustafa YILDIZ ve Yusuf Kağan KADIOĞLU.....	13







r'ETRÜL JEOLÖJİSİ/Pçtroium Geology

ASKAJE. «ASİMJa tİÜKASAN YÖTEStNİN SHMTİGİMFİSİ» JEOKİMYASI VE JİOFİZİK  
ÜFAFLİNDUİM&Sİ  
:Stratİ#Hİ%. G Mdtmfeİ\* NEM fapİal İtowpİİİH «rfAltak/\*kkwA %Umm %e\$\*»  
M.: \*r«AVUN. - Ümm ŞAF ÜKTÜWC: Cİsd İMBAY, fawnai «S U,  
Atama ©İİJEK \*e İt İwalH İXEEJL..... HI

ÜZÖMÜEKE (AKSEKİAMİALY A) ANTIKLİK İN E YAWWL İO UOL KAFAMİ ÜUWAK  
YEW KİR YAKLASJM  
A İNew Affradk İ» Swrtwİ Trap aİ Ümmku Midem, MarİfrArtrİw  
İdhNiabAİJM VİAK. MMrtteSONBUAİMMAC MavalWwAVTIU..... III

iAGu ANADOLU UAVZALAKMN sır^ncRAFtsİ JEGKİMYASİ  
W. İPROCAR&OI» POTANSİYÜXÄ:  
Ammf\* AJBMİQpy. Mnfrİfr YPİN\* «H İ'fwİttt^ İK..... İİe

İSRK - YUSU rİm CRTUM GÖLJ ARAZİKD, Kİ ZALİANİN KİZFT-CSÜMEY STRATİCFJUİK  
F. \*KİU KLAİJVE İ BDROKAĞON OLAHAXXÄJ  
Su\*İtp.pK« V« \*«xw SeWCCT Çe İmm to ÜK Nar'İ İHİİ Soutİ bpw-Ywufİ-To«\*rn İİe md. İkn

OMİHnD6MS. .... İİİ

İfrnOfİÖİK YCİrreMLEALE KİL ANWJZJ  
Çtar AİHlywİ bf Pymmkma UeSmh  
Ay»«(OB(\*İ(BtrrDKUmU «r HMOİaSONEL..... 416

PASWİER-TEKMAN m WÄAT HATOHAIHİNDİ OLAÄU İCAYNAKAY A BİRİMLERİMİN  
JEOKİMYASAL DEÜERLEİTİRMES;  
KçocİfİK\*İ B««İKn of İS P o s » ^ Se«re« Rode« m ^e Pwrte-TİrmM «nd Mürtt B\*İKU  
İLJ. HUEZ. T TEİDH. İ\* İTOW. Ö. AİW«ORİLP. A. ÜÖUR, R AOU. C SOYLU.  
İ BAU KL ERTOÖ. aİ SAVU m. A. HARPUT..... İİ7

DOG J KARAEKİZ ZÖLGESt; 00MOSHANE-BAYBURT4SPİR Ç-VADİ) TURA, Kİ-ETASE VE  
TERİTİCE Q» Q» JERİ« f KAYMAK KAYA DGEALH-İDRİVCEİ  
Som\* Rode E-İHİtkM of Öw İiwte, ÇrtMİMoaa and İmttaty Umü, GonAjh«n\* B««Kİft-bİn: Reş«m.

TawseİTEİCİM. YİUclZTANwOİW^ Hyİİ\*rrt^..... İİ

RİZE PETROL SSİNTBİNTN (OFFSHORE) JEOKİMYASAL DEÜERLEİHDİMESİ  
ÇrtJ\*İm\*« Çhar«etenCJOfİofRwOİS«TİOfİSİTOİTİ)  
Y. H«İ\* SrrAN..... İ»

KÖMÜR JEOLÖJİSİ/Coal Geology

HATİ KARAOÖWZ 'BAOFİSİN«İD İCOTULARB\* KORELASYONU VE TASKÜMORO ARAMA  
M JVNLAİ İÇİH OWERİİİR  
İİek Sc\* Rejim  
ÜmeİŞAlİİİfrRK. MwtaAAYONwİcMrOfİCAVDİN..... İİİ

SOMA HAVZASI ( D B A YÖİBİT- AİT' VE «İST ÜOTİT İOAMAÄURÖW RAOVOAKUVİİİ:  
İCHSİÖİ İLE PAİEÜOÖİAFYA (ÜŞKİSİ  
İrdroekİ. İy CoBİnu HE] Meaeofİ«İİk; Reİ\*İ wİİİİp «İl»wer KMI Um» Lİgnİt Smm. İİ  
Y«mT«JOÖNAY., «İw MAKCWA«w9«İk ÜİMEZ..... İ22

KÖPÜKLERDE YAMSCİMA VE ELEKTROUH. YAUFX\KİK\*İV U M U ÖİNDEN YAMKİANİN  
UmJRLWİvCSİHDİKJYEMİ  
«e Spontaneous Combustion of Coals  
OİSBMte«mSoaMveİİTriteHAUHT^ LALİ..... İ2J

DOO u İromİtoLEtroE m«A YAŞU: teİMİMERİM O R O ^ İK JEKİMYASAL VE PİTRC-G RAHK.  
WMİM İJFM  
Ofİtİc Kçocem wy «İ S İ««ro\* r'İc İmm» of İİ« İmİsİc Coab İn U « ÇÄÜCTİ İW «e  
İMİ«İ« K«»KMAX. WİÖA HAHH. Mİd\*İ HERİTİE «a MEOMaaİADİE..... İW

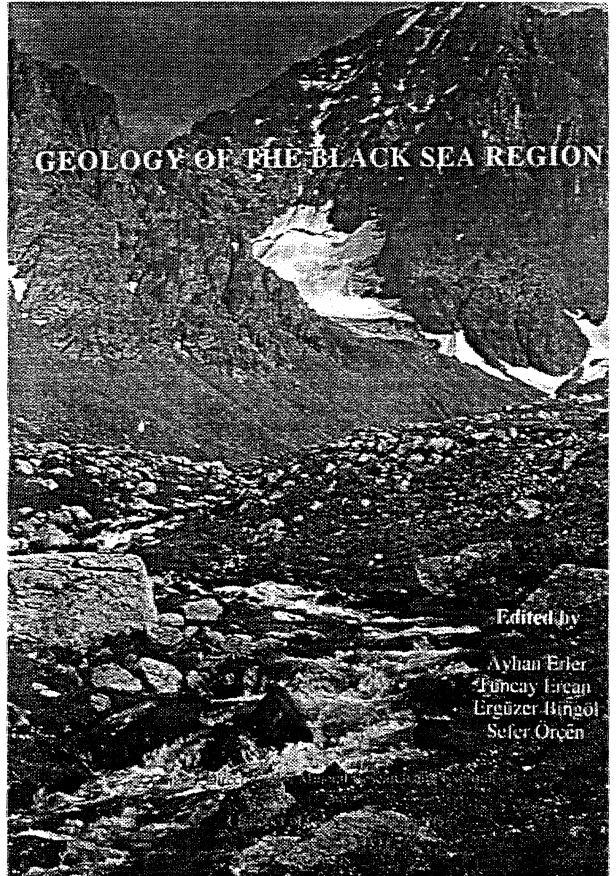
## Yeni Yayınlar

### GEOLOGY OF THE BLACK SEA REGION (Karadeniz Bökesinin Jeolojisi)

Editörler: A. Erler (ODTÜ), T. Ercan. (MTA), E. Bingöl (Ç.Ü.) ve S. Örcen (MTA)'

7 - 11. Eylül 1992 tarihinde Ankara'da gerçekleştirilen uluslararası sempozyumun temasını oluşturan "Karadeniz Bölgesinin Jeolojisi" kapsamında sunulmuş olan 100 kadar bildirinin 44'ünü kapsayan makalelerin yer aldığı bu kitap, Karadeniz'i, çevreleyen ülkelerin yeraltı kaynakların araştırılması konusunda gelecekte yapılacak incelemeler için bir kaynak: kitap olabilecek niteliktedir.

MTA Genel Müdürlüğü ve TMMOB Jeoloji Mühendisliği Odası'nın organizasyonu ile gerçekleştirilen sempozyuma yayınlanması için gönderilen makalelerin titiz bir inceleme ile basıma hazır hale getirilmesi, özellikle yurt dışından gelen 12 makalenin incelenmesi aşamasında ortaya çıkan bazı olasılıklar nedeniyle yaklaşık 2 yıla yakın bir zamanı almıştır... Basımı sempozyum düzenleyen iki kuruluş tarafından gerçekleştirilen kitabın dili. İngilizce olup 9 konu başlığında, toplam 44 makaleden oluşmuştur.



## "Geology of the Black Sea Region" kitabında yer alan makaleler ve yazarlar<sup>1</sup> aşağıda verilmiştir.

### CONTENTS

#### 1. GEOLOGICAL EVOLUTION

Pan - African orotraces along the South European suture zone Ivan Baydoutov	3
The Karfıkaya Complex, NW Turkey: A Palaeoethyan accretionary complex E.A. Rickett, A.H.F. Robertson and I.E. Dixon	11
Preliminary report on the presence of a Pte - Lale: Jurassic metacarbonate in Northwest Turkey (Almacıldag Bolu) Orhan. Kaya and Muharrem - Satir	19
Palaeoethyan tectonic evolution of the North TeÜyan liargin in the Central Pontides, ML Turkey Timur Ustaömer and Alastair H. F. Robertson	24
A geological revision of the Devrekani, Ajip and Kire - areas: New observations in Palaeoethyan - Reoteays sedimentary successions Maslafa Aydın., Osman. Demir, Yakup Özçelik, Nuri Terzioğlu and Mafcarfe - Safer	33
Stratigraphic features of the Efekdağ opolite Central Pontides, Turkey Menin Şengim	39
Tectonic evolution of the Dewekani basin (Kastamonu) Central Tunaolu and Baysal Batman	45
Post - liassic orotraces wedge of the Pontides and its implications on the evolution of the Black Sea Metin Şen gün	54
Stratigraphy of the Eastern Pontides, NE Turkey Sadettin Korkmaz., Necati Öyflöz, Murat Er, Ahmet Musaopri md İsmail Keskin	59
Structural correlation of the Phanerozoic evolution of the Caucasus - Eastern Pontides Shota Adamia, Salih Bayraktutan and Manama. Lordkipanidze	69
Geology and tectonic implications of the Kaakkaya area, Kağızman: Kars. (NE - Turkey) Necati Tüysüz and Ayhan. Erler	76
Geology of the Erzincan region and petrology of Quaternary volcanic rocks - H. Tahsin Akıncı, M. Emin Yurdakul, Metin Sanaslıa - Gülsen Mutlu., Mustafa Keçer, Talat Yıldırım, an - İbrahim Akkus	82

#### 2. STRATIGRAPHY - SEDIMENTOLOGY - PALEONTOLOGY

The first palynological age, sedimentological and stratigraphic data for Çakraz Group (Triassic), Western Black Sea Cengiz Alişan and A. Sani Derman	93
Mikmetpaşa Formation: A new palynological age and stratigraphic significance A. Sani Derman, Cengiz Alişan and Yakup Özçelik	99
İnattı Formation: A new unit for regional geology A. Sani. Derman and Alaattin Sayıl	104
The importance of the <i>Laffixema</i> (Focamiifema) genus at the Cretaceous - Tertiary transition. Nardan İhan	109
Late stage development of the Porto - Caspian Ak. A. Alizaie and E. Aliéna	119
Plio - Quaternary evolution of the Yeşilirmak delta, Northern Turkey Tendik Ertal	123

#### 3. MARINE GEOLOGY

Neogene - Quaternary sedimentation in the Black Sea basin. L. B. Meener, A. S. Gorahkov and D. A. Tagolsov	131
Geochemical effects of the Black Sea geocological monitoring (Northeastern shelf) Alexander V. Konarov and Alexander M. Ignatov	137
Peculiarities of seasonal delivery and accumulation of pollutants over the NoYorossiysk - Gelendzjik area of the Black Sea: Ecological consequences Alexander V. Konarov and Kazimeras M. Shimkus	148
Sea - floor gas escape features and the İncirli Basin, Northern Turkey Teoman N. Norman and M. Ender Atabay	154

#### 4. PETROLOGY

Magmatic and geotectonic evolution of the Poraide segment of the Nantide Tethys subduction Sijsem, Seçuk Tokel	163
Petrological and geodynamic significance of the Tertiary magmatism of the Kars - Manisa, NW - Turkey Petef Birkle and Muharrem. Sate	171
The provenance of Trojan bronze age pottery: Petrographic, chemical and Sr - Nd - Pb isotopic evidence Onno Knacke - Loy, W. C. Van der Meer and Ernst Peroicka	181
Alaskan - Appinitic type ultramafic and mafic complexes as the orotraces of the Eastern, Pontide magmatic arc, NE Turkey Osman Bektaş, andil. Hakkı Güveni	187
Noble gas isotope compositions in gas and water samples from Anatolia Tuncay Bean, Jun - İcşi Matsuda, Keisuke Nagao and Itsuro Kita	197

#### 5. METALLOGENY

General features of the Pontide metallogenic belt M. Taşkın, Ali Van and B. Uent Yağmalp	209
Wall rock alteration and trace element content at Ağıköy - Küre massifs Sulfide deposit, Kastamonu, Turkey Ayhan. Erler	214
Mineralogical study of the vein type lead and zinc deposits at the north-west of Şebinkarahisar (Giresun) Zeynep Ayan and O. Ozean Doğan	219
Geology and mineralization of the Gölbaşı porphyry Cu - Mo occurrence, Trabzon, NE Turkey Murat Er, Kemal Üdoğan and Necati Tiystz	226
Occurrences of Fe - Mn nodules, as a product of terrestrial - hydrothermal processes in the Trabzon area (NE - Turkey) M. Burhan Sadıklar	232

#### 6. ENERGY RESOURCES

New techniques in Black Sea oil exploration: The cruise of the R/V Gelen.dz, 1992 S. MacGregor, R. L. F. Wiles, A. M. Ignatov, Çetin Mumcuoğlu and Ali Yikhael	239
Investigation of the origin of gas condensate in the Akkalkoca - 1 well, Western Black Sea Selahattin Belin and İbrahim Coşkun	244
Tectono - sedimentary evolution and hydrocarbon potential of the Sinop - Boyabat İtasin, North Turkey Mustafa Aydın Osman Demir, Hüseyin Sebat Serdar, Soner Üzaydutan Bülent Hapsal	254
Maturity and organic matter study in Tertiary sediments - at Turkish Black Sea coast Tanse (Göker) Tetin	264
Statistical and geochemical evaluation of proximate chemical analyses of coal samples at Asma Mine, Üzümler, Zonguldak, Turkey Kadir Dirik, Aylan. Brier and Nurkan Karahanoğlu	269
Jurassic coal, occurrences and depositional environments in the Eastern Pontides, NE Turkey Sadettin. Korkmaz	275

#### 7. RECENT TECTONICS

A geometrical approach relating to the movement of the North Anatolian Fault Zone Mural Nınru, Baysal Batman, Jean Chocowi, and M. Ali Genç	283
The main tectonic structures of the Kelkit (Görmeli) region and their relationship with the regional tectonic structures, NE Turkey Hail Ginoy	292
The main features of the seismotectonics of Georgia Shota Adamia, Victor Alana. Simon Kuloahvili and Curam Shangelaia	300

Abyssal structure of Azerbaijan and its seismic activity E. Şenkinsky, A. Alwmdov, A. Bentwgen, S. Muradonov, O. Veremeyenko and L. Yakovleva	308
---	-----

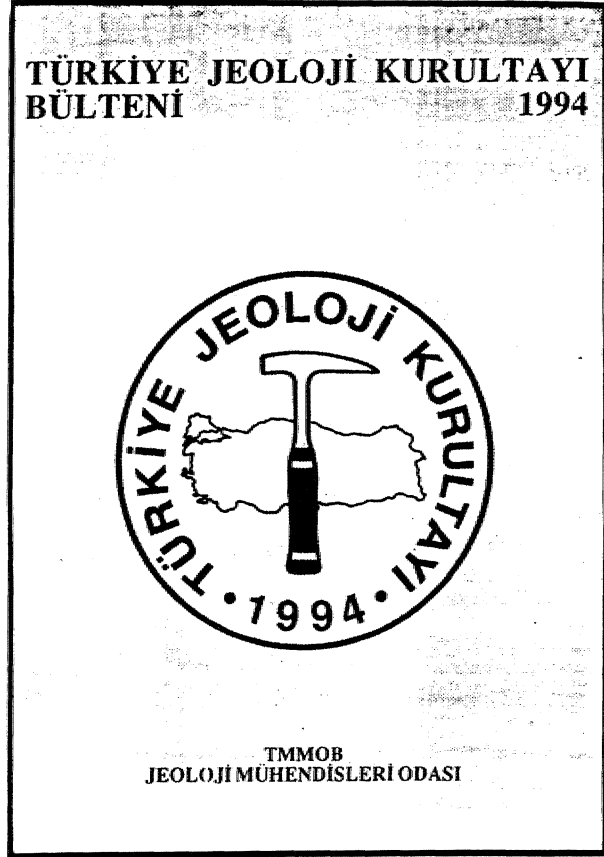
#### 8. ENGINEERING GEOLOGY

Of - Solaklı aqueduct - tunnel system: A case - study from the Eastern Black Sea area, ME Turkey Vedat Doyubhiç, Vedat Toprak, Tanrı Topal, E. Boira. İroşay and Erdin. Boztar	319
Land use potential of the Erzincan plain and adjacent areas H. Tahsin. Afcimur., M. Emin. Yurdakul., Serafettin Aief, Mustafa Keçer Saadet Potöğlu., Muzaffer Sönmez., Vedat İzzetark., M. Ender Tekiri md Ki, Şener Teoman	328

**TÜRKİYE JEOLojİ KURULTAYI BÜLTENİ -**  
1994, SAYI. 9

Editörler: S. Özçen (MTA), H. Yağcı (MTA), K. Karakuş (A.Ü.)

Jeoloji Mühendisleri Odası Yayını, 495 sayfa., 375 şekil, 12 Levha.



47.. Türkiye Jeoloji Kurultayı'nda sunulmuş olan bildirilerden. Kurultayı. Teknik Kurul tarafından incelenmiş ve kabul edilen 12 konu başlığında toplam. 53 makale yer almaktadır. İngilizce öz ve şekil,, çizelge, levha altı yazılan içermektedir. Bülteinde yer alan makaleler ve yazarlar aşağıda verilmiştir.

**İÇİNDEKİLER**  
Contents

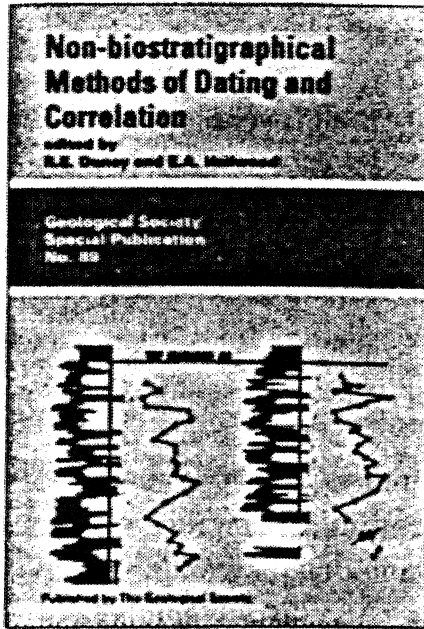
<b>MİNERALojİ-PETROGRAFI-VOLKANİZMA-MAGMATİZMA OTURUMU</b>	
<b>SÖĞÜT WMM</b> The <i>Söğüt</i> WMM Yılmaz K. KADIOĞLU, Ondor KAYIÖZ, Doğan AYDAL	1
<b>SARIKATA GÜNEŞİ PEOMATOİDİNDEKİ M-3İTİZASTON</b> The <i>Sarıkatı</i> M-3 Itizastone Ismail BİLGIN	11
<b>SÜRHİSAR-GÜNEYZÜ ÇEKİŞİMLİ GRANİTİK PEGHUUHLBİ</b> The <i>Sürhisar</i> <i>güneyzü</i> (Bakışlı) granitic pegmatites Nuxan OAO, Yaşar Ktbtd. İsmet ÖZGEMÇ	18
<b>ORTA SAKARTA HAVZASI (ESKİŞEHİR-BİLECİK) PEAMATİLERİ ÖN</b> MİMBHAJOJİHİ VE JEOKİMYASI The <i>mineralogy and geochemistry of Central Sakarta region.</i> (Eskişehir-Bilecik) pegmatites Nunm DAÜ. Yatar KİEİCİ İsmet ÖZGEMÇ	24
<b>İÇJUMDGU) GÜNEYİNDEKİ TERSİ-ER-KUVARTZNER</b> TOLKAHTAKK Tertiary-Quaternary <i>in a them. inner Anatolia</i> Omit ULU, Hüseyin ÖCAL, A. Kadir BÖLÜK, Mustafa KARMUŞ, Ali ARBAS, Levent SAÇLI, M. Adı TOŞKIRAN, Erkan EKMEKÇİ, Mustafa. ADR. Stuart SÜZERİ, Mustafa KARABİYOĞLU	33
<b>TENDİSİZK (DOĞU AK-LDOLU) JEOTERMAL JULANMIDİ YÖYADIN.</b> ZİLİN, CALDIRAN VOLKANOLOJİSİ VB JEOTERMAL ENERJİ mİMÄLİM Walcamatogy and <i>geothermal energy possibilities of the Tendizik</i> <i>area Diyardin, Zilan, Caldran), eastern Anataea (Turkey)</i> Enloğan ÜLMEZ, İtancaj ERCAN, Talat İLDIRİU	48
<b>DOĞU İÇMİDİ MAGMATİK AKTÖN KUZİY ZOHUKDAKİ</b> KALK-AL T KRET ASE KARBONAT PLATFORMUNA AIT YÜZEYLER MİHLER Outcrops of the <i>Upper Jurassic</i> <i>amur</i> Cretaceous carbonate platform in the northern zone of the Eastern Pontids magmatic arc (NE Turkey) Kemal TOSU, Ösmaja BECTAŞ, CeraÜ. YILMAZ	54
<b>TEKTONİK OTURUMU</b> KUZİY ANADOLU FAY ZONU TL74 BATI KESİNİNDE TAŞKESTİ- ÇAYKAY (EÇİU-ADAPAZIU) ARASINDA TRENCH (HENDEK) ÇALIŞMALARI Trench Studies on Ae western part of the <i>South Anatolian Fault</i> zone between <i>Taşkesti-Çaykay</i> (Bakış-Adapazar) Raftızae, DEMİR AS.	62
<b>13 MART 1994 ERZİNCAN DEPREMİNİN YZSİZ RİKİFAR</b> ART CI SAHSLVTLARI VE 17 SKİM 1969 LOSL< PRIETA DEPREMİ İLE KARŞILAŞTIRILMASI Comprison of the <i>swiftem cracks of ihm Erzintzan earthquake of</i> <i>March 13, 1992 and ks' aftershocks with Jlonm Jweto caruhquake.</i> <i>of October 17, 1399</i> İbrazaan DeMİHTAŞ, Barçham YILMAZ, Ham BERÇEÖCR. Bodo BAİEBL	72
<b>TEKİRDAĞ'IN TARİHSEL VE ALETSEL DÖNEM DEPREMİELLİĞİ</b> Earthquake activity of Tekirdağ throughout historical <i>and</i> <i>Instrumental periods</i> FadıJ UnetYOKSSL	91
<b>PALEONTOLOJİ OTURUMU</b>	
<b>YUKARISAZCAGIZ YÖRESİ (GÜKÜH KB. SİVA) LÜTESİEİTHİM</b> BİYOSTRATİ GRAFİK OLAMLARI VE PALEOSKOLOJİSİ The <i>biostraty and paleoecology of Lutetium of Yukansazcağız</i> <i>anu mürm NW Sivas.</i> Sefer ÜRÇEN, Ayş eçÜJ YEİDİZ, Vedia TOKER	97
<b>FAZAROE. (KAHRAMANMARAŞ) VE DARZİNDE (B MALAYIA) HEKİMİHAN (K3 İHALATTA) YÖRELERİNİZKJ OKBİ-OİDES' PARAMETRELERİNİN KARŞILAŞTIRILMASI</b> Comparison of the <i>Orbitaides</i> parameters <i>arammı</i> <i>Paznank</i> <i>(Kahrarrtenmara) and Omele (W Malatya) Jwethm</i> <i>(NW Malatya) areas</i> Mutülün GÖRMÜŞ, Engin MERİÇ, Mijrad AVŞAR	109
<b>ESKİRSELER KÖYÜ PALEOSBH YAŞLI KARTEAL FORMASYONU</b> İÇİNDE YERALAN İZ FOSİLLERİN ORTAJUSAL ANAULİZİ POLATLI GÜNEY-ANKARA The <i>environmental analysis vffnsis included in the</i> <i>Paliocene Kar toI formation of EskiKasler tillage</i> <i>aSouth Polatu-ANJULUJ</i> Hulye DEMİRCAN	126
<b>SEDİMENTOLOJİ ÖNİRÜMU</b>	
<b>[UMAN EMŞAK İSKELETÜ KARBONAT BİRİKİMLİRLİNE</b> BİR ÖRNEK: KOP KTRÇTAŞI (MİS'OSEN). KOP DAĞLARI, DOĞL ANADOLU The <i>example of temperate skeletal carbonate sediments;</i> <i>Kop Ürnes tone, Elnaem &gt;eS, Kop Mountains, Eastern AnatoUa</i> Cani YILMAZ, Hasan KOLAYLI	135
<b>SİVAS KAVZASINDA KARACAÖREN AMRALE-DİSTAŞ PİVRİĞİ. ARDINDAKİ TERŞİYEH YAŞIA ÇOKELLSRİN</b> ORQANİK FASİYES ÖZELLİKLERİ Organic <i>facies characteristics' between Kanacaören Omranü)-</i> <i>Diktaş (Divriği Tertiary s&lt;zdiments in Rltms bmsin</i> Mehmet ALTÖNSOY, Orhan ÜZÇELİK	141
<b>ÇİHANBEYLİ-KARAPINAR YÖRESİ GEÇ SENOZOYİK ÇÖKELKE</b> SİSTEMİ: TEHTONİK VE İKLİMEL ÖNEBÜ Late Cenozoic <i>depositional system of the Çihanbeyli-Karapınar</i> <i>region, southern Inner AnaLoUatectanic mad (MmaEk' implications</i> Omit ULU, Hüseyin ÖCAL, A. Kadir BULDUK, Mustafa KARATİŞ, Ali ARBAS, Levent SAÇLI, M. MM TAŞMIRAM, Erhan EKMEKÇİ, Mostafe ADIR, Şİnası SÜZERİ, Mustafa KARABİYOĞLU	149
<b>GENEL JEOLojİ OTURUMU</b>	
<b>MARMARA DENİZİ ÇEVRESİNDE GEÇ KOVATERNERDEKİ</b> İNSAN YAŞAMI İZLERİNİN DÜŞÜNÜRDÜKLERİ Some <i>thoughts on traces of humara tife around these</i> <i>of Marmara during late Quaternary</i> Emm İMERİÇ	1M

GÜTETBATI İÇ AMDGUTNGM MESOZOYİK-ERKEN TERSİYER STRATİGRAFİSİ 'VB YAPILAR EYLİMİ Mesozoic-early Tertiary/stratigraphy and structural evolution of southern Inner Anatolia Unit ULU, İfıfıçto ÖCAL, A-Kadrl BULDUK, Mustafa KARATAŞ, İİLİRBAS, Lerait; SAÇU, M. Adı TAŞBDMN, Ertan EKMEKÇİ, MustafaAMR, Şfıasi SÖKERL* Mınstth. KARAFİMÖGİLİ.....	171
BOLU ESAS> GABROYA KAYALARINDA MLKROFAERİK MTCofabric study ofgabroic rocksfmm. the Bolu Massif .Hayrettin KORAL, Süleyman DALGİÇ, AB. Malik. CÖZÜBÖL.....	183
PUXLUR MA6Ö1 UEHRÖZÜL-BAYBURT) ©ÖHEYBAI KESİNİNİN STRATİGAFİSİ) VH METAMORFİZMARİ .. Stratigraphy and metamorphism of this southwestern part ofthePukur massifCDemirozâ-Bayburti GÖHeldn. TOPUZ* M. Burina SADIKLAR.....	188
HOYRAN TERSİYER PWOJEU HAVZASININ OTATİ-ÉFİBİ VB EKONOMİK POTANÖYSİLİ Smit&napki amat economic potential of the Heryma Tertiary (ffloffiane) basin Mete: HANÇER, M. Erkan RMMMA.....	201
ÇAYKARA (TRABZON) YÖRESİNDE METAMORFİZ BİR TEMEL VE BUNUN OLUŞU BUNANEDEN OLAN BİLGİMLERİ METAMORFİZ KA A metamorphic basement in the area around Çaykara flnataMf Salim GENÇ, Lütfi ALTINKAYNAK.....	209
DORTYOL-PAYAS İN TAKTAJ KİLİ OVASINDA TARİHİ ÇAĞLARDAKİ JEOMORFOLOJİK DEĞİŞİKLİKLERİ Geomorphologic changes during historical time* in DŞR&taf* (Antakya; plau*) F. Sancar OZAKER.....	317
DOĞAL KAYNAKLARIN UZAKTAN AKÜLANMASI: MEVCUT DURU M, YENİ EĞİLİMLER VE MTA UZAKTAN ALGILAMA itaate. *ms.ing of matured resources; Currnt stadi*, new tmd* amat MTA Remote Sensing Oenler Hayan KOTONCU.....	226
MeMMM YATAKLARI OTURUMU KİOMİTLERDE İUBMLEHİŞ DÖNÜŞÜMLİKRE DİR ÖRNEK : EYMLR YÖRESİ CSANOAL-ŞİVAS) DEREÖCAK KROM CBVBHBLİŞİOMİ Sivas) ..... Osman KOFTAGSL.....	233
ESKİHÖY (LXAS-9İVAS) KROM YÖRESİNDE C MAGMATİK EVRE KROMİT OLUŞUMU: İ 3TA ÇÖZÜKLEKE Young maf/matte eh rom İte accurencea in İeskİ&loy diromic area (Ulos-Sit-Gs): A statistical analysis Osman KOFTAGEL, AU UÇURUM, James J. SJOBERG.....	244
BİLEÇİK-SÖĞİM ALTIN ALİNERALİZASYONUN İNCELENMESİ The investigation of Bilecik-Söğüt gold mineralization Önder KAYADIL, Dİgaa AYDAL, Yanıl Kağan, KAHOGLU.....	252
EMİRLİ (ÖDEÜŞ-İZMİR) ANTIMON CEVİRELERİNE İLİMLİN OLUŞUM MODELİ The formadan model ofEmirli Ödemf&xmW antimony mineralizations Nevta KARAOĞUL.....	260
SAYSAKÖY (MELAA MUĞLA) BOKSİT YATAĞININ PARAJENEZ VE OLUŞUMU The par agenesıs one origin ofSauranköy (SP.IasMuğlai bauxite deposit Allan GÜMÜŞ, Neta KARAOĞUL.....	274
ENDÜSTRİYEL İMMABDELER, OTURUMU ESKİŞEHİR-9İVTİM&AR ÇİVARINDAKİ SEDİMİTER SEPIYOLİT OLUŞUMLARININ ORTAMAL YORUMU Facial interpretation of the sedimentary sepilolite occurrences around Eskişehir-Simih&ar HEkan GaaMOÖUL, Tteer İRHEÇ.....	28
MIHALGAZI İESKİŞEHİR 3ENTOMİTİNİN KİNER-LOJİK ÜZELLİMLERİ VB OLUŞUMU Mineralogical characteristics mmâ origin of Mihedfiozi (Eskişehir) benmitte Faali ÇOBAN.....	297
KONYA-KARAFMAR-SULTA-NİYS OVA*, QKAB0É VE ÇİVARININ JEOLJİSİ VE TUZLU BU SEVİYELERİNİN G 1 1 and İİ* surroundings *rimı the et<duaion ofstısalıf/ water levels /rom İfıe point of Mağİ AbduHab Mıde:ÜZGÇVER, Mostaf. BOYKOTEMİZ Atoduırahman MURÂT, Otaman GÜKMBNOGUL.....	304
BEYPAZARI (LANKARA) DOĞAL SODA (TRONA) BAHAŞLIMN MİNERALOGİ ZONLANMASI Mineralogical zonation at the naS-ural soda (trönaı field. Beyp<ıxan (Ankara) Femla ÜKER.....	21
SUNGURLU BÖLGESİNDEKİ ORTA EÖSEN SEDİMANTER FORMASYONUNDAKİ MONTMORİLLONİT OLUŞUMLARI Montmorillonite oecememom M the Middle Eocene sedıter. antery formation at the Sungurlu (Çorum) amem Ş. Al SAVIN.....	330
FOSFAT VE TETİSİDS KRETASE-SENOZOYİK ZAMANINDA FOSFORİT ÇÖKELMİ Phosphate emı. phosphorite deposition in the Thetkw* during' Cretaceous-Cenozoic time AMaİli Mete ÖZGÖNER.....	351

KARŞIVAKA BARAJ YERİNDEKİ KATA KÜTLELERİNİN Geotechnical properties of rock masse* at the Karsyaka dam mİ Aydn ÖZSAM.....	361
İSTANBUL KIÇUK ÇEKMECE-FIRUZKOY-ATAKÖY Cleo tech rJcaı study ofıstanbul Küçükçekmece-Firtzkau-M&KŞif sewerage tunnecı routes Şdattı İta KOÇAK, Zafır YUCEL, Texer YAIW, Oktay ALTAY, Serdar KOC, Beğül BULUTU Emdı ÇÖVROÜLİ, Nur ÇİÇEK, ktm İTÇEN, LAİTĞÜE.....	367
LZMİR ALIAGA KARAAGAC KOYU'MLN JEOTEKNİK ETÜDÜ Geotechnical investigation of Izmir Aliaga bay MColet TURK., Mehmet Yağın KOCA, Faruk ÇALARE, ULU.....	373
AYRIŞMANIN ANDEZİTLERİN PETROGRAİK KİMYASAL V> JEOMEKANİK ÖZELLİKLERİNE ETKİSİ Effects of the weathering process on the petrograpUcaı chemical and engineering pmerıte* of the andesites Mehmet Yağın KOCA Neodet TOMİS.....	382
ANADOLU OTOYOLU BOLU DAĞI GEÇİŞİNİN MÜHENDİSLİK JEALÖJİSİ The engineering geology of the Anatolia Motorway *%Botum*m,nt,dn,s*ge Sülyman DALGİÇ.....	393
İBEÇİK (OOLDSAR-BURDURJ KALKARENİTİTÖN MİNER-LOJİSİ. FİZİKSEL VE MEKANİK ÖZELLİKLERİ. İNŞAAT BEAZEMESİ OLARAK KİİLİL&rajİBİLEJİ:Öİ The mineralogy of Endik İaııısarMurdurif İcaıcaremıteı physical and mechanical features and, the stability of using İt* as a construction İmsterıet Rıstan EEHLIVAN, t, Halil ZARIF.....	398
YÜZET MODELLEME VE BİLGİSAYAR PRO<2İAHLAMA SİSTEMLERİNİN ÜÇ BOYUTLU ŞET: 8TABİİTESİ 'İıe importance of surface modelling and computer programming s&atİms in thrve-dimensiono.İ stability assessment of slopes Mail KİMSAR.....	407
GENERAL ENGINEERING GEOLOCAL ASPECTS OF MELANGES AS EVIDENT IN SOME LANDSLIDES 'MetajMa mbazıİcağmal'm*a,gnhİmem genel m&SkemMstik İhan' YILMAZER.....	413
HİDROJEOLJİ OTURUMU atf&LTURT OVASI PEÜZEY KIBRIS TURK CUMHURİYETİ YERALTISJYU KAY7AKLARININ OPTİMUM İŞLETİMİ Optimum management of the groundwater resomes of Güzeyurt Basin (Turkish Republic of Northern Cyprus) Hüseyin ÇHAÇEKÜŞ, Vedat DOVULUBr.....	42 i
İSTANBUL-TERKOS HAVZASIN HİDROJEOLJİSİ *The hydrogeology of the Terkos basin H. Murat ÖZLER.....	429
KADİFEKALE, (İZMİR) ÇEVRESİNDE HİDROJEOLJİK DENGELİ BOZUKLUKLARI Disturbance of the İdrojeolojik&ıxtıl balance İn. Kadıfıekale İzmır) Şeekİ. İİLİZ, Gültekin TAHCASF.....	430
KARSTİK DÖNÜŞÜMLERDE TERALAN OLUŞUMU, ÖL HACMİ İLE SU KATKILARININ ARASINDAKİ İLİŞKİMİN KOYADA ÖLÜ ÖRNEĞİNİN İSTATİSTİKSEL İNCELENMESİ Statistical examination o/relationship between take volume and spring discharges in the İaces located at farsıctic areas: İR the examplıs >İfİhe Koada laSee Serdar OKAN.....	448
KOROZİF YERALTI SUTLARI VE DİGER ORTAMLARDA FÜC ÇPÖİVİML SXORÜR) İLE TEÇHİZİN ÖNEMİ VB YURT EKONOMİSİNE KATKILARI 'The benefits an. national economy mmâ İmportonsce of mstâİıng in oorrosıtae envıromment M. Yİtaraa KİFER.....	453
JEOTERMAL ENERJİ OTURUMU BİR JEOTERMAL ALANDA TERMAL PROFİLDEN YARARLANARAK GİCAK SUYUN DÜŞEY EİZİNLİ TAHSİMİ me estimation o/uer İcaı velocity of thermal water by mse of thermal pıfıle in a geothemal field Orh.au. DPMLÜ., İL Tolg,a YALÇIN.....	460
POROZ, BİR ORTAMDA TSK VB KJ FAZLI İSİ TRANSFERİNİN FLNİT&İİFERSSCE TEKNİK İLE. MODELLENMESİ VE UYGULAMA ÖRNEKLERİ İfıııte-dİÖTemence mıodet of two İııentional, single and two phase heat transform İn a ponıts medium and some application examples Zejnuel A. DEİİREL.....	465
KÖMÜR JEOLJİSİ OTURUMU TÜRKEYE İARDAHAN-po&ıııı; GmReİSTAN (AHİSKA-VALE) SİNİRİNDAKİ KÖMÜR OLUŞUMUNUN DOĞU ANADOLU'DA TEİR KÖMÜR İMKANLARI İLE İLİŞKİSİ Relation of coal occurrence in Turkishİoergıaı barder with new coal possibilities in Eastern Anatolia İbralıııı İtkan ÇAKMAK, Qıner ÜNVR.....	474
ÇEVRE JEOLJİSİ: OTURUMU GEDİZ HAVZASI YERAL TIS ULARIN D AKİ BOR KİRLENİMESİ Boron contaminations of the grıxmıdwatır in Gedız Basin Şeykı İÜZ, QOUİeldn İARCAN, Ufuk İHMAK.....	483
RADYOAKTİF ATIKLARIN DEDEM OLDUĞU KİRLENMENİN ÖNLENMESİNDE MİNERALLERİN KULLANILMASI QOıar GÖYMEN, Haydar İLKER Meral HOŞCAN.....	492

**NON - BIOSTRATIGRAPHICAL  
METHODS OF DATING AND  
CORELATION  
(YAŞLANDIRMA VE KORELASYONUN  
BİYOSTRATİGRAFİK OLMAYAN  
METODLARI)**

Editörler: R.E. Dunay (Mobil North Sea Ltd, İngiltere)  
ve E.A. Hailwood (Core Magnetics, İngiltere).



Kitapta denizel olmayan oluşumların egemen olduğu periyodlar için stratigrafide önemli sorunların ortaya konulduğu, sekans stratigrafisi korelasyonu ve yaşlandırma için kullanılan biyostatigrafik olmayan yöntemler anlatılmaktadır.

Bu yöntemler, genel olarak minerolojik, kimyasal, izotopik, luminesans ve dönemsellik analizleri kapsamında gruplandırılarak, çeşitli disiplin ve tekniklerle geniş bir silsile içinde verilmiştir.

Kitap, özellikle hidrokarbon araştıran ve üreten jeologlar için, özgün korelasyon problemlerinin çözümünde oldukça yararlı olacaktır.

Dili İngilizce olan kitabın önemli yazarları ve içindekiler:

**Principal Authors**

R. Dunay (Mobil North Sea Ltd, UK)  
E. Hailwood (Core Magnetics, UK)  
A. Carter (Birkbeck College and University College London, UK)  
A. Dalland (Statol, Norway)  
C.V. Jaars (Cambridge University, UK)  
M.A. Mørge-Rasmussen (Oxford University, UK)  
A.C. Morton (British Geological Survey, UK)  
T.J. Pearce (Chemotrol Consultants, UK)  
I. Jarvis (Kingston University, UK)  
A. Racey (Consultant, UK)  
H.M. Rendell (University of Sussex, UK)  
J. Roberts (University of New South Wales, Australia)  
J. Russell (Shell Research, The Netherlands)  
C.S. Yang (International Geo Consultants (IGC) BV, The Netherlands)

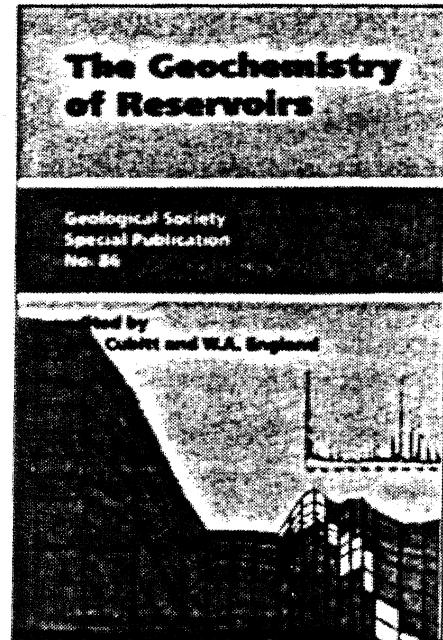
**Contents**

Non-biostratigraphical methods of dating and correlation: an introduction • Correlation of sandstones using heavy minerals: an example from the Stratford Formation of the Snorre Field, northern North Sea • Subdivision and correlation of monotonous sandstone sequences using high resolution heavy mineral analysis, a case study: the Triassic of the Central Graben • Clay mineral stratigraphy in Palaeozoic & Mesozoic red bed facies, onshore and offshore UK • The application of fission track analysis to the dating of barren sequences: examples from red beds in Scotland and Thailand • The use of chemical element analysis in the study of biostratigraphically barren sequences: an example from the Triassic of the central North Sea (UKCS) • High-resolution chemostratigraphy of Quaternary distal turbidites: a case study of new methods for the analysis and correlation of barren sequences • SHRIMP zircon age control of Gondwanan sequence in Late Carboniferous and Early Permian Australia • Direct Pb/Pb dating of Silurian microfossils from Gotland, Sweden • The application of Barium/Strontium-Neodymium (Sm-Nd) Provenance Ages to correlation of biostratigraphically barren strata: a case study of the Stratford Formation in the Gullfaks Oil Field, Norwegian North Sea • Luminescence dating of Quaternary sediments • Wireline log-cyclicity analysis as a tool for dating and correlating barren strata: an example from the Upper Rotliegend of The Netherlands

Geological Society Special Publication: No: 89, 266 sayfa, 150 şekil, ISBN 1-897799-30-6 Mayıs 1995 Ediri: 60 sterlin / 100 dolar.

**THE GEOCHEMISTRY OF RESERVOIRS  
(REZERVUARLARIN JEOKİMYASI)**

Editörler: J.M. Cubitt (Geochem Group, İngiltere) ve W.A. England (BP - Statoil Alliance - Norveç, İngiltere).



Rezervuarların jeokimyası, rezervuarın içindeki su ve minerallerin, petrolerin kökenini ve yayılımını ortaya koymak konusunda yardımcı olmayı amaçlamıştır.

Rezervuar jeokimyası, petrol aramalarında pratik uygulamalarda oldukça önemlidir. Ayrıca daha da önemlisi özel bir kuyu yada horizonun farklı bölgelerle arasında

ilişkilerinin ortaya konulmasında oldukça önemli katkılar sağlamaktadır.

The Geochemistry of Reservoirs", problemlerin incelendiği ve de sonuçlarının irdelendiği makaleler, uygulanan tekniklerin tartışmaları ve genel değerlendirmeleri bölümlerinden oluşmaktadır.

Dili İngilizce olan kitabın başlıca yazarları ve içindekiler:

#### Principal Authors

S.R. Larier (University of Newcastle, UK)  
K. Bjorlykke (University of Oslo, Norway)  
P.C. Smalley (BP Exploration, UK)  
L. Anisimov (Saratov State University, Russia)  
R.P. Philp (University of Oklahoma, USA)  
A. Wilhelm (University of Oslo, Norway)  
S. McNeil (University of Tsukuba, Japan)  
N.H. Odoko (BP Exploration Operating Co Ltd, UK)  
W.A. England (BP-StatOil Alliance, Norway)  
D.A. Karlson (University of Oslo, Norway)  
D.P. Stockli (Universität zu Köln, Germany)  
P.C. Mason (Fina Exploration Ltd, UK)  
A.C. Apin (University of Newcastle, UK)

#### Contents

Geochemistry of reservoirs: an introduction • Reservoir geochemistry: methods, applications and opportunities • Geochemical constraints from formation water analyses from the North Sea and Gulf Coast Basins on quartz, feldspar and illite precipitation in reservoir rocks • Geochemical criteria for reservoir characterization • Compositional heterogeneities in oilfield formation waters: identifying them, using them • Characterization of high molecular weight hydrocarbons (>C<sub>30</sub>) in oils and reservoir rocks • Overview of the geochemistry of some tar mats from the North Sea and USA: implications for tar-mat origin • Fractionation of pyrolic nitrogen compounds in petroleum during migration: derivation of migration-related geochemical parameters • Diagenesis of the Rotliegendes Sandstones in the V-Fields, southern North Sea: a fluid inclusion study • The filling and emptying of the Utsa Oilfield: fluid inclusion constraints • Migration of hydrocarbons in the Tampen Spur area, Norwegian North Sea: a reservoir geochemical evaluation • Modelling density-driven mixing rates in petroleum reservoirs on geological timescales, with application to detection of barriers in the Forties Field (UKCS) • Petroleum geochemistry of the Haltenbanken, Norwegian Continental Shelf • The reservoir geochemistry of the Ekofisk Field, Norwegian North Sea • The reservoir geochemistry and petroleum charging histories of Paleogene-reservoired fields in the Ostar Witch Ground Graben • Sour gas and water chemistry of the Bridport Sands reservoir, Wytch Farm, UK

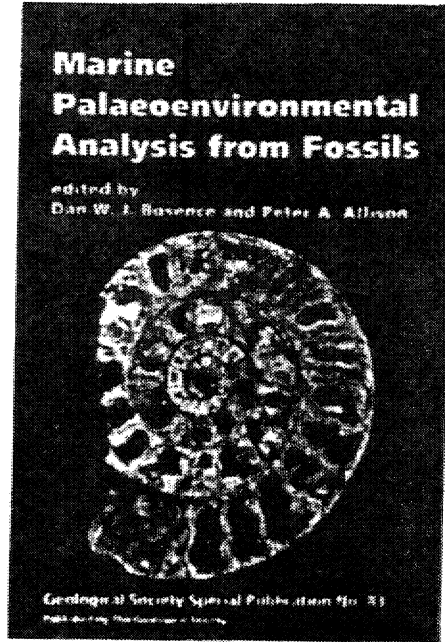
Geological Society Special Publication: No: 86, 328 sayfa, 216 şekil, ISBN 1 - 897799 - 26 - 8 Mayıs 1995. Ederi: 65 sterlin / 108 dolar.

## MARINE PALAEOENVIRONMENTAL ANALYSIS FROM FOSSILS (FOSİLLERLE DENİZEL PALEOORTAMSAL ANALİZLER)

Editörler: D.W.J. Borence (Royal Holloway, University of London, İngiltere) ve P.A. Allison (PRIS, University of Reading, İngiltere)

Makaleler, gelişmiş jeokimyasal izotopik analizlerle daha güncel, taksonomik uygulamasıyla paleontolojik, paleoekolojik ve jeokimyasal yöntemlerin belirleyici çizgisinde çok disiplinli olarak hazırlanmıştır.

Kitabın yaklaşımı, tekniklerin üzerine yoğunlaşmış ve taksonomik olmaktan çok, daha analitiktir.



Kitap, aynı zamanda sedimentologlar, stratigraflar ve paleontologlara son derece gerekli eski iklimler, sekans stratigrafisi, fasiyes modelleri ve çökeltme ortamlarının paleoortamsal yorumlamalarında önemli olabilecek fosiller ve onların izleri ile elde edilmiş verilere odaklanmıştır. Dili İngilizce olan kitabın başlıca yazarları ve içindekiler:

#### Principal Authors

D.W.J. Borence (Royal Holloway, University of London, UK)  
D.J. Botjer (University of South California, Los Angeles, USA)  
R.M. Corfield (Oxford University, UK)  
J.W. De Leeuw (Netherlands Institute for Sea Research (NIOZ), The Netherlands)  
J.-C. Flézel (Université de Paris-Sud, France)  
P.A. Allison (PRIS, University of Reading, UK)  
M.D. Brasier (Oxford University, UK)  
R. Goldring (PRIS, University of Reading, UK)  
C. Perrin (Royal Holloway, University of London, UK)  
A.M. Smith (University of Otago, New Zealand)  
J.W. Murray (University of Southampton, UK)

#### Contents

A review of marine palaeoenvironmental analysis from fossils • Palaeoecological models, non-uniformitarianism and tracking the changing ecology of the past • An introduction to the techniques, limitations and landmarks of carbonate oxygen isotope palaeothermometry • Organic carbon as a palaeoenvironmental indicator in the marine realm • Modern and fossil mangroves and mangals: their climatic and biogeographic variability • Palaeo-oxygenation: effects and recognition • Fossil indicators of nutrient levels. I: Eutrophication and climate change; II: Evolution and extinction in relation to oligotrophy • Organisms and the substrate: response and effect • Quantitative approaches to palaeozonation and palaeobathymetry of corals and coralline algae in Cenozoic reefs • Palaeoenvironmental interpretation using bryozoans: a review • Microfossil indicators of ocean water masses, circulation and climate

Geological Society Special Publication No: 83, İngilizce 272, sayfa, 175 şekil, ISBN 1-897799-21-7, Şubat 1995.

Ederi: E/60/US\$ 100



# Jeoloji Takvimi

(Geochronique  
no. 58, 1996)

1996

16-18mai 1996  
Cramcsfăx, Franco  
F^ti^i cka SctenoB< öä te lêm » et  
de *mmm* hosimes sur S> thém< :  
wiptgpf< «tans te totiep<.  
— J@vt-ïM> Mliommo, F^ivai d<S  
Sdim m, Hôtsl da >> BP 3S, 74402:  
Chsmoxix C<oi<w, Franco<. Tél.  
3300 S3 38 24. #m 33A0 S3 > 81.

\* 1^24 mal 1996  
Comihe. Géoc  
luli> Earmquak's te; th> Geologie^  
r&eorcl.  
— Jisstp H<«t<«kovie, Euroiptan;  
Science Foundation, 1, quaj Uley  
-Marnes>a, 67030 Strasbourg CeCex.  
franc<. Tél. 33/88 76 71 35.  
Fftx 33/83 36 6@ 87. E-miir : tu<  
roacoOesJ.org. ; wwwserverjit : lvtip :  
.l.Awww.ösi.ofg.

19-22 mai 1996  
San CKego. Caiiforme. USA  
Gtootal «xpictatkon >nd<@ot<chno-  
to», Aaf>G, MfUMMäl<Mting.  
— jyy>G ^Cowrrtip D<i^, Box 979,  
TWsa, OKT 4101> USA. Tél.  
1/918 560:26 79. Frx 1^918 560 26 64.

2QKE2trai19>  
Rom< «M@  
Mnd Symposium PFIQEOE ^it «m<-  
émam> symposium ért th< con<«ve-  
Hon «f our t^okH^C<i«Kit>ö< : g@o-  
top< cw<«>ükM4.  
— :Sacneta>f in> symposium. Zar-  
br^a *fmom*. EN6VCRE-CASAC-  
CIA, S.P. 105, Via Anfittiar>#.. 301>  
00060 flame Itaii>. Tel,  
06^30 43 47 Q2., Fax 06.00 48 30 55 -  
08->30 4B 39 47, E-mail ; zaridnca^c<-  
s^ccia.>n<«rt.

21-22 mai 1996  
Lyon, Franco<  
Journée> Claud> Batoto : actuaiKe<  
Fm^eoto4oflkjuea.  
~ P.R. PachfrbCöuf, URA 11.,  
Sd<nces do 11 T#rr<, Univ. Cl>uCe  
Bwnard. Lfm 1. 27-43 &d. cu 11 nov.  
1:910, 69622 VIU<urütinne C^dex,  
Fransc Tél. 33/72 44 84 15.  
F<. 33/72 44 84 36.

\* 21-24 mai 1996:  
Sa^nt-P@rsbo>Irs, Russes  
nfQMriBÉioftM #KlmbfwOff fttKJ ^ympOi-  
slum : mlN<rai r^>otrics of CIS  
countries fCommo ^ww^th of In<le-  
JKmdönt St>ts>.  
— MlRfi ^96 ; Orgar^ir-ç *Crrrtvttm*,  
P.O. Etoz 215. -Mîneräta>. 199004> SL  
P&lers&Jurg. Russia /M- 7M/ 23 55 79 S2  
Fax 7/81 22 13 S< 2€, €-mail :  
%gs0 50^vam&u/sov^u.a.com ; ou  
root@rostec.>ä5pa.su.

22-24 mai 1996  
Cora, It&@  
1st International Conf<«iwK@ : T#<#  
lnS>&t of MyäshY m *mmäwvw*  
riittGMusrcmf  
— Storm. 1^ Comwgnö Intamadonä<.  
vyia Erba, 22012 C@moböto> Como,  
Italic Fax 31/340 \$40.

27-29 mai 1996  
Win^psg, ManüolM, Cmsäm  
@mfc^öaä «mmäEtäm of Caffatfa &  
Mk%>o^l mS&<Mäctfi of C&täct&

— O.S. Clark> Depi geaiogicsl  
Sctomn, Univ. of Wannabe. Winni-  
peg, fvtmtooa R3T 2M2, Canada. Tél.  
1/204 474 ^S7. Fax 1/204 281 7581.

\*27m@i^2Ju\$996  
iratroa AHamsfw  
PEAT, 10th ifilertttttlU>É Cof^mss.  
Im^S<.  
~ 4.D. Becivr - Ratän, Oeutschä GÖ-  
saisstaf< für Mcw und Tori^und<. PO  
BOK 510 153, D - 30631, Hanowt, Al-  
lemagne. Tél. 49/51 16 43 24 95.  
Fsx 49^51 16 43 2304.

jum1996  
Polopwe^ Fmnmian>  
Mmdmkm tkm Bé&toym> \* Sué<  
Oim f (AGSOI, ^>curtioo dan< !<^  
C&rpatres nord orientais, «te Ora>  
cövk à Oui, «fi Pötogn> wt Roums-  
nik<. in n^ 56.  
— M. Hiavottet, 57, av. ÜB Beauxint.  
64000 Pay, Franct. Tél.  
33^59 27 54 4&

3Njn1996  
Pa^Ffano@  
SociéSé néülöšk|i# é<« Franco<, a>-  
semoté> bef^ftfi> et ccwfénmoi.  
— SG? 77, om Qmxi^ Bimmé, 75005  
Paris, Franc<. Tél. 33/1 43 31 77 3<.  
Fax 33/1 45 35 79 10.

3-7 jy< 1996  
Amsternarr,, Pays-Bas  
Eufo^an Association öt ümcam>^  
tmU à Sr^im^rb [EAOÉ SSh C on ^  
retne<).  
— EAGÉ É.H. aomtrnp> iPO Box, 29S,  
NL 3700 AG, Zalsl> PayS^Bat. Tél.  
31:30 6912 655.. Fax 31 m 62 14Ü.

\* 3-7 Juki 1996  
Québec. Canada  
Vlir Coftrés <«> l'AA^oclatkin c^u4-  
bécobe pour rétiid-e du Qu<@m^if>.  
— Marie-Françoise AmSté, Oèpana-  
m<«m et> Géogmphte, Univorarté dft Ü-  
moges, 39E ru> Camille Guerin,  
87036 ilmofo<«> Ceöax, Fr,iti#.  
Fix 55 43 56-03.

9-12Mn1996  
Wisntnçton, USA  
Hm Am<dc>n Pal^ontolofit< Vth  
Convention,  
— rMPC-VK c/o D<pi Pai<ofcok>çy.  
Maä Stop 121, National lluseum of Na-  
turaJ, Washington DC 20560. USA, Tel  
1/202 377 1814. Fax 1/202 786 2132,

S-12juin19@6  
WMÜ#on, DG, gJSA  
Biotki rwocofct< from iftia< Extmc-  
ikwm, K3CP Project.33S.  
— Douglas H, Erwin, Dept. Pateobto-  
logy, NHB - 121., Smin&of-Ian Instity-  
t.on, Washington OC USA 20560.  
Tél. 1/202 357 2053,  
Fax; 1/202 780 28 32.. E-mail ;  
nnhp028<5^ns.>ci-.

9-13 Hin 1996  
Budapest. Honpi@  
3rd kstfMnstion& Confartnc< on Iffil-  
nraS#>@nd Mustum Tradition.mé

— M & M 3 sacraiajat, ce Hungarian  
g^oicccca Soaeiy. Budapest Pf: 433,  
H-1372, Horigr<«. Ym 36/1 258 7952.

\* 10-12^t1996  
Nantis, Francs  
QÉORÁYÁH^S E Ip#&trouâlrl1@  
Plamatl @pp&c^ué@mm Sci<fticSs é@  
mmmm,  
— David C. Smitfi, Lab. da Mnêraio-  
gkJ. Muséum NatfonaI c^Hi<otre Natu-  
rell<, 61 ruo Buff on, 75CD5 Pari>,  
France. Tél. 33/t 40 79 38 27.  
Fax 33/1 40 W 35 24.

10-12Ji^t1996  
Batwm  
P<TOT@dtB@ : Mddlth Edwt S^fwf  
smi F^lmchemlC6l< C<«ftt#<ne< ä  
mmmm,

— Si^p^en Ksy, Arabian exhibition  
nanagemani WLL> PO Box 20 200,  
Manama, Bahfan. T éd. 973/55 W 33.  
F< 973/55 32 S3.

10-12jirin1996  
Sw D>go Caiifcmi<, USA  
3rd im<ärtationöi symposium on en-  
vkomr<«nt>i g^otfrchnoi>^y,  
— E. f^otl^ar, Fritz Engineering La-  
boratory^ lemgh Unr/ersity, Bethteem.  
PA18015, USA. Tê<. 1/610 75S 3520.  
Fax 1/STÜ 758 4522. E-mail : mmm&-  
high.edu.

12jun 1996  
Paris, Fram>  
Histoire <téptetémioio>^ é>ta Üéol-  
ogla - Réunion commun> SGF -  
COFtHKSEÜ ln n^ 56.  
— Jean Qaudant, sucétrair< du CO>  
FRHÍEÜ, 17., ru# çtu Or Magnan,  
75013 Paria, Franca ou Eric Butafatut,  
SocHtê géotogiquo da *fmnem*, 77> ru<  
Claude Bernard, 7500ä Parté, Franc<.  
Tél. 33/1 43 31 77 35. Fax  
33/14535 7910.

\* 12-19 jirin 1996  
Bucarest. Roumanie  
IGFT90, fiOth ämémmyr üš tit<« Gec-  
logicalsI Inffitut< of Romania. |pr<  
snd post>^Kcuratons)  
— Afioneta Saghedí, Kitutui O<otog-  
ic al Rcmaniei, &tr. Caranaebes 1,  
7S344 Bu cure a il 32, Rou mania.  
Tél. 40/16 35 75 30. Fax  
40/13 12 84 44. E-mail :  
mobimngem.

17-21 Juin 1996  
TrondTröim, Norvège  
im M. tympowitMTI m iafwMda.  
— Kiare S<«sat, Otppi Geotectini<  
cal Engineering. Hmw&Qum irafitui> of  
Technotocy, N-7034 Trondh<«im, Nor<  
way. Tél. 47/73 59 4> 02.  
FAM 47/73 59 46 09. E-mail :  
kaara-Aenn<sel<«9ot<K,ur&Lrw,

19-21 Mu 1996  
Jtommaj, Ouét^c, Canada  
2nd North American Hock M^cHa<  
rite< Symposlym (NAflMS^96). Too>a  
arid T<«m u< ^ Rock Nt<chanic<.  
— Norma Procysnyn, Dap< of Mining  
& MetaJlurgical Enginewin<), Me Gil  
Unvarsity, 20 20 Unhf&fsity Str>et,  
Box 102. Montraí OC Camda H3A  
2A5. Til. 514/396 43 83.  
Fax 514/393 B3 79. E-mail :  
nofTnaOrnin-mei.mççifl lan.Ca-  
^2-29jdn1996  
Houston.. fixas< USA  
9th Int<fnation<! PalynologicaE

— Y>J9tm M.Bryant, 0<«&t anthropo-  
logy, Texas ,#L & M.U.W. Coi<«g< sta-  
lion. TX 77043, USA, Tél.  
1/409 \$45 S3 42. Fax 1/409 B44 4070.  
E-mail : glwrenn ou vbyrantflttam.  
adu.iswm.sncc.isu.ed>^

24-27 juin 1996  
San Francisco, Ca. USA  
Second Inl#matJcmal Airborne ft>^  
mot<« Srttang Ccml>rmei wü B>xh-  
ävton.  
— EWWArton<« Crrt<«r<«nai> PO Box  
134001. Am Arter, M 43113 - 4001.

USA. Tél. 1/313 994 1200.  
Fax 1/313 994 51 23. E-mail : wall<

° 21 juin 1996  
Jwmé@ mmaOkm cl> l> AÜP ia&>^o-  
eMfo> eu< Qèoktçwm eu Parafen} /

— «31> J.P. D@otç% BRGM DOTäIG, BP  
6009., 45080 Ort^am Cedex 2, France..  
Tél. 38 64 3834. Fax 38 64 23 51.

\*27-2^Bjw>1S@e

— The tkmfefwne> Offica, Ftö> Inatitu-  
tion of Wining and Matafargy. 44 Port-  
land, Pl>!, Londes WIN 4SR, G.-B.  
Tél. 44/117 15 @0 38 02.  
Fax 44/17 14 3@ 53 88.

\* 29 Mn - 2 ju&eí 1996  
Budapest. Hwçr^s  
4m workshop Eurapwai> Palaontoto>

ias@t&fip&stHfKl HofflwSOT@ «WOIÜi>On<  
— LGfavog>^>Sternm ^bstiitj&deGöo-  
logla, 1. M Btesstç, 67064 Strasbourg  
C^ktoç> Franc<. Tél. 33/83 55 85 70.  
Fax 33/88 3@ 72 33.

7-13 Ju M W<  
WJadson, Wc. USA  
2nd totanwlilonal symposium on aut-  
tant>ml<festi Cliairaphyt&.  
— Ctarcpcfyt> symposujm, Lab. Paeso  
botamfw, €P m2.MmméStmK m,  
Pi. S.Bataillon. 34095. Montpellier  
Cade> S. Fiffnce. Fax 33/67 04 20 32.  
E-mai : paidooocHficnturF^>monip^>fr-

8-11 ML 1996  
Ramas. Franc@  
Cofioqu<« bitareattkia^ dTYdyroieti<  
t<«> gssDan dt> mmm, Br<«tagn>«98.  
— Alain Jigoret, fMSA d^ B&rw m, Dé-  
pait de Géní<«M. Lab. de rotoiérato-  
ç>«> « géotechnqç> 20> avanua de<  
Bull<@!> d# Coramaa, 35043 P.ennas  
C^klox, Frime<. Tél. 33/99 28 65 3&  
Fax 39J9^63 7 05. E-mad : atoMLjgo-  
raffina^mfinasJir.

\* 8-11 juttaf 1996  
Biaiv^>Paria, Franca  
3^ Congre> Européen d^s Ottraoo-  
d<«é@«i^s : Ottracööokifili< «évéfít<  
tit&fifHMla> it# # so.  
— S.0>S>«U>Unrws^P. & W. Curie,  
lato, da Mkrapaféontotog&á, Tour 15-25,  
4E, Cl^a 1Ü4, 4 pi. Juamx 75252 Pana  
Cedex 05> Fmtoa Tat 33fl 44:27 90 37.  
Fax 33/1 44 27 38 31. E-m^il : cms-  
qujH&acçJawewfr.

\* 9^12 juüfít 1906  
Acem, Ghana  
WAIW m Tb> 2nd W<st AMofi In-  
t^rn>tion#l Mining EihibUlön A

— Sort<« Ihomaon, Exfoitotlon M n g i-  
mi Sarvetei ftyLÜd, K) BÖ<« 6SO>O2,  
B<«nmof<« 2010, JoKannescb^g, Soufto  
Alria. Tél. 27/(0)11 783 7250/1/3/9.  
Fax 27/p>1 1733 7269.

\* 11-17 füület 199@  
France  
EKCUfsloti <TOTWé< d<« (AGP^ : Je<  
Alp<« 4u nord (Qf1aficonn>í> Va<

— AGP J.F. Owwi, BRGM DFVGIQ, BP  
6Ü09^ 45060 Ovléara OKS>X 2, France.  
Tél. 3a 64 3S 34. Fax m 64 3361.

19-17 jutt. 1996  
GroniKto., Espagru  
Cephatopod< « Pnt<«<«nt <>d pa%í- lV  
lot#m<«uónaö symçK^akiru  
— Ffdwico Otörk Säax ou Francisco  
J. Fiodriguej< - Tovaf, Opi. Eitraikjrafia  
y Pa)komolO#>a> UNv. Granat. Avd-  
fuent> Nuov<«aM. 18002 Gronwfts> Es-  
pa>jva. Fax 34>&S-24 33 4S. E-mail : Ir-  
tovarOçouat.Ltgr.es.

15-1ÜJU< 1996  
Exei&f, G-B  
EroHMon> net> wim<«nt ytol> : glot>af  
<nd nagkwwM p <«> ; tlv>^s> Interna-



WIM » 8. &ÖL TA 44/171 4« 19 51  
 Ym 44/171 413 82 12. E-mail: aabnfttmonfnatcam ; Iffcümtt :  
 http //wwwmmvww/QQM ou Bote Goh,  
 Soppo » «N tütoi 'semc&i Pm L\*W  
 Hsr% watif # 15-0a Catfay tAsW» Sir>  
 >ãa\*\*öf» W22\* Tél. 65/338 47 47.  
 Fax mm® M si. sum : M U M I -

25-29 w|M. 1996

Chwrnoklta and granuHla lac Jaa  
 «ete» tatofswrtteWi SpnpsstiuF  
 — V, mm Mdhrrn, DApL of Qwiogi,  
 Univaratty of Madras» A.C. Colteg®  
 Campus, Madras, imi® PW 800025.  
 Tél. 91/44 235 11 37. Fa\*  
 §1/44 235 28 70.

\*30 aapt-3oeL 1996  
 Santfal Jggw\*  
 Gwypag panafnrnting radaf.  
 — M. S-to, Opt. of Rs»smirc@s Engin-  
 n««rtfio, Tohoku UnNäfsUy, S»-rläif  
 980-77. Japon.

7-110011906  
 Canari, liafe  
 FwrUs Internallonai rymposium 011  
 «wlrncmwMltsBt Issu« and wanE#  
 mmm\*mmmm In «natoy w@é mtrnaraj  
 — R. Cfcoy, DipartinWiTo di GacÉw-  
 gnwú »|@cmjfuš ta Ambtantaju (OM-  
 GIfAI. U r n e n dagfi SteA di Ca#w,  
 Ptecs tf Arnd. «3» 123 Criaait halte.  
 TA «39 70 200Q317/2UOOTWOTG322.  
 Fax 9/70 27 20 31.

ft-11 o d 1986  
 imm, Estonia  
 IWrtt Baltic Sirsticr&pftlcaí Conta-  
 raneai  
 — Clnim Kalpa Institut« of Geology,  
 Estonian Academy of scenes, 7 Estons  
 Av«.. «E0 100 Tallinn, Esionte.  
 Tél. 7/37 22 45 46 S3. Fa» 7/3?  
 26 31 m 74 E-ripúš .ka9»apzgeol.gi.aa.

\* 8-11 o d 1996  
 St PttsrstMWrg, fusw®  
 tatarritallonai aymppoaUim : larg«  
 amf «5Lr&-&ig-«& (unkljIM) «topasúä of  
 rar« uta pradtoti m#tstl« (ganafic  
 s spaces nttog da-vloppma-nt prob-  
 bkH-m\*  
 — Y.B. Marin, St Pttfarsboursa. Stal\*  
 Stlnkg Intitut« fTi«lkwaK Untuarsty)  
 21th U.M., 2, V.O., Si Patorabourg,  
 199 020 Russk. Ta (812) 31 SB 247.  
 Fa\* (812) 21 32 613 ;  
 §312j 21 85 463. E-mail : maffnftmi-

9-12 o d 1991  
 Mngaiok Jamafciaj  
 Usturd Huttlflü antif Oteaatara.  
 — S. Carby, D«pt. of Gaotogy, UW.  
 yor», Kingston, JamaQua. E-mrill :

9\*13 act. 1996  
 öwflta, Qféc®  
 G«&g«á Sowlb« oi Ámaffea\* P#ft-  
 ros« Conf\*rnc!S. Exhumation Pm\*  
 cs«e& : Normal FauJmtg, DuctSI#  
 ftow» isnd E-trskm.  
 — Lois J. cims, WiStarM Exp-sn«cs.

GSA, 48S1 &MW19 Sun Lira» Catalda  
 SprintS. Co 80917. USA. Tél.  
 1/719 »7 9201. F« 1/719 591 4BS2.

\*10oct9@i  
 PWSi\*FRWO  
 fésédéftscf« M §é§ito# du ?''é»

— P. PtmmU, LCPC, «bd. Lsftotom».  
 75732 Paris C@dt5 15, Franc«.  
 F« ai §®@ 43 54 W.

\* t3-ia©.d. 1996  
 Bywmas Mus, Aršj@ctint  
 HiS & rš@niin& góofogtcl csmff®  
 snd 111 hyóroccsrbon »Kplof&iüön

— §««ta?Y, Xlií CQA, Mátfu S4S, piso 3,  
 1006 Buenos Aires, A-genim-s.  
 Tél. (541) 322 3SS2/3244, 325 BD66,  
 333 SW. F« P4tj 325 M ».

\*1S-20oct 1996  
 Ctikm

laUofi of opflollta« mmé «oleatile  
 arcs k% H@ ciresiwi. «»nrtem mskvu  
 — Utoatt, Dias ti® V a\*\*\* mat G®>  
 logta y Piteortlo^a, Wa Bte^ca y Car-  
 rstén Cwitm, Ciüüad 0« te w n n ;  
 CP11000 Cuba. Fax 637 336 345.  
 — Gramrite Draper» Dept of Gteogey»  
 Fl 3319®. F» 300 346 3077. E-Nfll :

\* 20-23 oct. ta «  
 Hoy«ton,USA

— Oabbi Boonstm» MPG Edycáiton  
 D@pt., Po 80sc §79, Tulsa  
 OK 74101-0979. USA.

\* 21-24 od. 1 » 8  
 C«m»é»» Franc®  
 totoctoio« Français «ta TmwtoE  
 an Souterrain (AFTCS) : joumé^g  
 tf éteA»@fen«isnwtooi«te«; X|IJWS« P®  
 ®n souterrain : d#« l^chfttqu«s #1  
 dos wowwww »  
 — S#crétartat AFTES/ei>F, Buraau  
 4/71, 22-30. Av. d« Wapwil, 7500S  
 Paris. Tél. 33/(1) 47 64 84 7?  
 Fax 33/pi 47 S4 7S ».

\*21»»oet. 1996  
 Nioa, Francs  
 121\* eonfféft pattonal ém sacUté«  
 tti«SO«iig&& »i ^ckmiosis!^s.  
 — CTHS. 121- congrès» 1 nm Bm\*  
 cartes» 75005 Paria, Franca.  
 Tu. 1641)46 34 4763.

\* 21-26 oct. 96  
 SinsidHASF. Franc®  
 Dapeayatama ol pirosptsorit® end  
 r^liitod mulMi^m%lc minrsia. Pro-  
 o«sf#s., palhwafi «mld products.  
 WO\* 325, fšyntar» Anala.  
 — L.«I.J. Lucas. Insirtut ém Scmo» de  
 te Terre, 1 rue Blass ig, 07M4 Stras-  
 burg Caca«. F« §331 S| 36 72 35.

24 oct. 1996  
 Rafinas, Francs  
 Toctoulsrm, «uSt&i&# et enr^g%  
 — F. Guilloch«au. Geosciences  
 Plemm, kmf\* Qéc09-« eampfit Beau-  
 liau. a». du Gnéral. Lecter 35042  
 Rann OS Codes., Franc«. Tél.  
 33/93 23 §1 23. Fax 3S/9S 26 67 80.

28-31 oct. 1996  
 D m r , Co, USA  
 GSÄ : annual mafftfeng.  
 — J. Kirmey, GSA Hqdquarters,  
 Box 3140, 3300 Panros® Placá,  
 aeuidar Co. 80301. USA. Tel.  
 1/303 44? 2D20.

nw. 19 «  
 Réunion es Geophysiku® iippšÉyéé.  
 — J.M. Quiéardel. UFG, 79. rui  
 O««ki Barnard, 7SO0S Paris. Franc«.  
 T«. 33/1 47 0? 91 95.  
 \*4-5HÖ». 1996  
 Paris, Franc®  
 P|CU\* P^Uclp&tion frimc®lm. Siten\*  
 Pwifwcitwš»  
 — J. Ray. lab. dö Strstigrâ^hi© se-  
 «POTIMlê it mkropaléorEolOfie. tetf\*  
 lui d@s Soancea é» la T^rrt., Unww-  
 s>lè Paul Sabâtior. 30, allées  
 Jutes«Gutsdfl, 31QQ2 imÉoum Cedax,  
 FrancT. Tél. 33/61 53 02 35.  
 f« 33Ä? 2© 71 40.

4-? nov. 19®  
 LA@ Suera Vista. Ftodd®. USA  
 £CO\*NFORMA^&3. Global Uwt~  
 mmk® for Eiwftmrur-ia. inlonini«  
 ll«ifi : Bridging th« «U@p #lw««n

— Pktmt mgtse% ERW, BOK 134001. Am  
 Arbor MI 48113 - 4001 USA.  
 Tél. V313994 1200.fiax 1/313SW 51 23»

En Europ® : Olio Hutzingar. Tél.  
 49/ 921 552 245 ay 155.  
 Fa«4»S2t\$4S2S.

^r & ov. WW

— Mürws#»i Petroleum SociétF» PO  
 Bm 1®97 WiskH Ol24 Otso»Mwig#.  
 Tél. 47/22 43 00 50. Fax  
 47/22554130.

\*@-14W. 19S6  
 Btomey. <rtanda

e|w ti^ lu ímif dlm@nsJonÄ : @v-  
 (j^io® of s«i4mil «üd lisfiktd #nvi-  
 rofom«nt«l ch@iis#t @t th\*

— RX Oi^oy (Cört\*, oto. VSÉto Alj-  
 sacher. Iwopsar« Sciww« Foundation.  
 1 quai Liay-Marnésia» ®70»0  
 Stfisioura Cid#K, Francis  
 Tel 33/8B 78 71 35.  
 FÖK 33/SB 3€ B9 87. E-mai« : #u-  
 r®M#sf.w9 ; WWWswver : littp :

11-14 nov. 1906  
 UCa1ra.ÉaypM®  
 «a>olt^iteal aumaya artd s»lai^i«W«  
 d^AWpm^nt ; Otote«k»l Swwy of  
 Bifp| é«««%«l^ai. n n^ 53, (daí«a  
 mocÉiml  
 — M. EL Whrawi» Oaotogteal Swwy  
 of qfvpt, 3 Saiaf Ssiwi Rd» A M »  
 aiya, L® Calm., Egypt®. Tél.  
 2iWa 1025. fax « 002 | ft» »20128.  
 15-16 nov. 1996  
 Ana», Francs  
 L® CmK objat péoloouf«®, ré«@r-  
 vai?, mšértas »l papniQ«\*  
 — N. Dwmpoü. Se^óttè @«a\$»«U9 du  
 word. Univ. Sei, #1 Techn. d# Lilin.  
 Sci«C«É Ttrm, SššSS Vienowđ d^Mcq  
 Cedw, FrwiÄ fix 33^20 43 49 95 ou

\*1S-20iw. 1866  
 Hystertibid, mS®

— .tesociaSion of éxptoratron Gaophy-  
 meiste, cm Buédng. USFrana Urnw-  
 scty. Hydrabsd 500 007, India.  
 Tél. ©/140 701 90 01, 17 13 13.  
 Fax 91/443 701 90 01. E-mail :  
 a\*farnccs.unaí.in.

17-22 nov. 1996  
 'Kin^silit Järatšwš  
 MfctelGW ^ il« Humki Tropto «nv^  
 ranman, Inaamillonai B]«jipOTliun.  
 — SaciiH Humnid Trcp«s «nviron®rt  
 93, A. Ivan Johnson, 7474 Upham  
 Court., Arvads, CO 60003 USA.  
 Fax 1/303 425 SS 10.

\* 20-21 iw. 199®  
 lrrt@maü©nl »amirair on pié»om«\*

— ITC - PA^MAGS. Geoscisnce Lã-  
 borsloy, Gacogical Surv-v of Pakifit-  
 toí» PO. BOA 1461, S^dhzad Town. Is-  
 lamabad, 44000 Pakistan.  
 Tél. §2/51 24 04 23.  
 Fax 92/51 24 02 23. E-mail : per-  
 frsps 9ft ij^soisbšcsteipk. ufflMp. ofQ.

22 fm. 19©6  
 Psrls^Frait«

La @«@«@# ém %f@nô& awrf&@m áá  
 détint riy XCT ilêcto : i te mémok«  
 du PTOIMSMW!», «E tévèqu®.

— P. Bfoqwl. Ficytté um Šömm.  
 Lšé. dö Geolog. Structuré al Appi\*  
 Quéš. 1. pi. lUdanc 2600 Bô&artç®,  
 fntm. Tél. 33 S1 86 S7 13.

\* 2-3 dae. 1996  
 Parts, Franc«  
 LA M i » Créte«4-«rotHkz@ : mp «cl«  
 btotogkp» et «oi&gQUš. m n^ m  
 — E. BuKetajt st N. Búrdet» Lab. Pa-  
 iéOntoloÇá d« Verltéftés, 4 pi. Jus-  
 smj, Cm® tm. 752S2 Part» C&úéx 05.  
 FrancT. Tél. 33/1 44 27 35 14.  
 Fax 33/1 44 27 4©92.

\* 3-5 dec. 1996  
 Londras. Q.-B.  
 PÉTSX^6, P^šfoi&um Exploršlion  
 Confš«mcc® smé Exhibition.

— 3 DC Èvšfšits, Busi««ss Ossiqn  
 @rtff\* Ltd. 1T113 Dov«r Street Lon-  
 don W1X 3 PB. O.-B.  
 Tél. 44/171 495 5S 00.  
 Fa\* 44/171 496 78 08.

\* 6^11 dec 1996

— K.V. Ragnaraclottlr «Brist«^ e/b. J.  
 HemWosvic^ European Seltne« Fouty  
 dáilon, 1 quai Lazy«Marnésia, 670^)  
 Strasbourg C&áQx, France. Tél.  
 33m8 76 71 35. Fax 33/83 36 69 87.  
 E-ma^! : @urssco«eaf.org ; WWWsar-  
 «mr : Htp : ffofww.mf.mQJwumscx»

11 st12dec 1996  
 Parts, Frano  
 Séotm«ntoi«šk3 ék ta matièere org^  
 niqW.  
 — F. Baycin, Lab. Straligrapii«, tour  
 19-11, 4 pi. Jusstau, 73252! Paris; Codex  
 05. Franc®. Tél. 33/1 44 27 4© 57.  
 F«x 33/144 27 36 31.

\* 12dec 1906  
 Pwm, FwRO®  
 Infomatpk«® @t šécito##.  
 — J.-L. Durvil«. WPC, 15 8d. L«-  
 Wws. 75733 Paris C«d«K 56. Franc«,  
 faxil) 40 43 54 95.

## 1997

lanw«f 1997  
 >:«XigULttt®  
 Drought, greundwaför polhjtion wné

— Managing director, Tamibnadu  
 waler supply and drainage board,  
 TWAD House. Chapauk, Madras  
 600 00S. irkte.

\*1i-24|@wtor1®97  
 Puerto VaBam M^XK^UÓ  
 ÍÁ VCE1, g^mirsl m b if.  
 — Qiga^zmG Cömr-łitšé, imJiüio d«  
 Cc&otmca, UNAM Ckcuio «Kterior,  
 Ciudad Univers H ariá. C.P 04 510.  
 y^tqua. D.-F. Fax 5/550 24 36.

\*2f-29|amw9f 1997  
 Osjo, Norvèg^

lšew Tmnds In G@osct@nc® Compti-

— Korw«ôte» Pwtrólmin Šoctoy, Po^  
 Bos 1S37 Wa, H 0124 Oslo, t^orvèe.  
 Tél. 4 7 « 43 00 50. Fax 47/22 4 48:30.

\* &-Smir§1š9?  
 tündmt,a«B.  
 T «WWSiSSiCOWiJŠi .fiwi 1|T|šrl|ottšwQNiHAI  
 TRIN«GWCaw  
 — Bob Hofdswoth, Oept «l^ G^oJogi-  
 cil Ciencias, Unjverality of Ournam,  
 Durham DH1 3LE, G.-B. Fai 44/  
 01 191 374 2510. E-mail : fl.E.Hold-  
 iwüft#diifn#fiac.ia.

Yaoynd« Csmafoun  
 3^ Coltoqu« lit stratigraphie el dá  
 paiéogéogfAphU ô& l^AttanUqu«  
 mi4 13^ Coiciquiv« «Mcaln ck micro-  
 p«ttéEhll#logik« «t Conférence snm-  
 ak^ Ö» riGCP n^ 381.  
 — Société n^1 tonale des hydrocfa-  
 byrts. Comité d^rganisa t or, des Cd-  
 toqim» UP ISS. Yaounde, Carnorom  
 Té«.«237J SO 32 S3. Fax (237)  
 20 46 51/ 20 SB it.

\* 20-22 mar» 1997  
 Šévm^ Eapagna  
 GetaXJ» Hšpamj-frafvçóls : mlteus  
 c^rt>onatéš contšmštaufc  
 — J.-L. Gu«TXbš. CNRS, Centra Aixota  
 dö Gàogrsprti® Physique. 29., Av.  
 R.-Schuman. F 13621 Aix-en-Provence  
 C«d«% 1. Tél. 42 95 38 70,  
 Ym 42 95 0M 20,  
 — F. Etez 0@i Omo. Dspl. OéogrspM«  
 c/Moria ck Padila «/n. 41002 Šévite,  
 Espagn». Tél. 34/54 55 13 06,  
 fm 34/54 SS 13 51.

\*24-27 mars 1997  
Braga, Portugal  
Ihm Atti> ai f'ortuL<fr< Lan g u@ s@  
Counirtes G\*och<micAl Cwiftim>  
«lailiMIQHfhtottttf'ratattatfe\*«\*  
ISMI WWSK  
— @m<cu&a Dlw, Opt Otoydu> d< Twm

Brags CoddCr Portugal. T\*\*\_ 3S1 /  
53 60 43 OS. fmx 351/53 00 43 04.  
E-irwll : gaoqijmlca<@! .uminho.pt ;  
URLhttp : /Hal>eLumaiho.plW>\*Vho-

\*@-11 avriMOT  
yon<, Ba^iqw  
Q4o\*o@k Re9ionôte du Sud-8fBbant  
aux eoMm^d< l'Artote,  
— p. ô or m ü et M. Hamabart, Ser-  
vice de Geôtagi\* fmuamma@ et Ap-  
pliqué<, faculté Polytechnique de  
Morts, rue ëe Houcain, S - 7000 fctans,  
Belgique. Tél. 32/(0) 65 3? 46 08.  
Fax 32/(0) 65 3? 46 10. E-mail :  
catnOtpms.fipms.ac.be.  
\* 13 avril - 3 mai 1997  
Rabat fmf oc

Symposiums «t af<«f Karst hydro-  
— IABS SAS-97 Orga/Wing Commr-  
tee. Ckractkm générale d< ntyttaui-  
liqtf>, Rabat-Ch^ilah, Maroc.  
Tél. 212/7 7@ 90 08/77 87 42.  
Fax 212/7 77 S6 96.

\* 14-1? «vriM 997  
IMptfitttr> France  
Congrès international : teochrom<\*-  
QW Wrt&fWwio<«fP?> Cûil O&fiO3M)SCLiil @fi  
Eiiorp< #1 domam>tt r<Més.  
— J.-P. Aguitar ou S. Legendra. Lab.  
'da Pajèontoioig^ - CCS4, Uoiv. Mont-  
pellier II. .34095 fUkmpatfaff Ceox 5,  
France>. Tél. 33/@? 14 32 51/54.  
Fax 33/67 14 36 10. E-mail : bio-  
chrom^isorm.urMv.mof^p2 Ir.

\*23awrtl-3mai1997  
Rabat Waroc  
ABtf8? • 5' assemblée< scienttfkjus  
d< rAssôciatton lni^rntationuV des

— IASH'97 Or<«ràî^ Comitéta. Di-  
rocbon Général de iHydnulk|U<, Ca-  
si<f Rabat-Crieña^ -Maroc- Tél. 212/  
|7| 77 90 m /77 B7 42. Fax 212/  
|7|77&6 96,

1W1 mai 1997  
Ottawa, Canada  
Ottawa'97, Réunion Afiftwst# de

eoefation minérwioffi<!\*>\* «y Ca-  
m^a ct\*c< 757, 601 ni\* Boolh, Ot-  
2A CISA M\*» KtA OEB. Té.  
&«iMI : Ott>w\*Ö7<<«\*w.Gâ.

25\*30 mai 1997  
Jémsalwn> Uraü  
itti) ffit>fittta>ag Q\*och<«nic<< £x<  
pJorsrtion Symposium |AEG|.  
— IGesStvnlarM. PO BmSOÜOO. Td-  
AvTv.61500isfaéJ.Fax97Z'3 514 0C77.

20-30 mai 1987  
Genève. Suts&ö  
Europ<«n Aa\*oc of üttdosaftrista &  
Enginar@ (EAO£), Strth C@nf<f^foe.  
— EAGE EH. Bomkamp. PO Box 298,  
NL 3700 AG Z&isi. Pay-Bas. Tél.  
31/3Ü6l 62 6SS. Fax 3 1 0 > 62 640.

23-27 M" »?  
Athènes, G^èce  
SpyfMÇidWhwfl iitTtwTWPoniÄl sw la {fwo\*  
käfte de 3Jng^nmr ü d> f&v\*ron-  
n<m<rrt  
— IABJ. "Afh<w 97". P.O. Bon 1@ 140  
GR. 117 10 Athènes. Grèce Fax  
301/924 25 70.

1"-9juMeU9e7  
Metoume. Austral  
1997 Joint @ss<Mf.ôes of th< IM<«\*  
fotiwiujp Associa lö&n of W#AOfio^o^y  
and Atmospheric Sciences & Mm »  
fntkMêi Association for Physical  
Sekmemi o! the Ocean,  
— 1MIAS - IAPSO secretariat,  
Convention Mitwork> 224 Rouse  
strett, Port Me->t>ourm Victoria 3207  
Australia. Tél. 61/3 96 48 41 22.  
Fax mm 96 46 77 37. E-mœe : mscar-  
tettfupagi^jcwjg.

10-12 Jâit 1997  
Vienne, Austr^he  
Emrop<afi Paj<«onioSog&cAJ äasod<^  
'tiort, 2\* Congrès #uropé<n d\* Pa-  
Hontoiotia : cûmates, past, prnsant,  
fütur@.  
— L G^üvögd-Stanvri, tñstît^ öö Gé-  
otogl<, 1., aie Btos^ 67084 Strasbourg  
Coda\*, Franc<. Tél. 33/86 35 IS 70.  
Fax 3 3 < 38 72 35.

\* 10-t^aoü<1997  
La Chaux-de-Fonds ;,N<uchâ;el),  
Summ  
IT Congrès in tentation al dtt fpé-  
tëoiof < at @\* Coltoot cPhydroJogte  
<n paies cscl<«r< #1 «fi mfJku ffls-

— Sublim<, Cast@ postal< 4093,  
CH-23CM La Cnaux-cte-fonds, Sutsse.  
E-mail : oono^f^yja?4toh|^4jiiimEh.  
I\* Colloflii< d%fâratogi< «n j?>ys  
eatealw «t «ci ms&su ««««r^\*, »O «X-  
ajr>éomf1S-17>oütJ., o^5a  
— F. ZwakJsa Contre tî<«c&po@éoto^e>  
11, rut £fhHe-Argand, Ctm postato 2.  
CH 20Q7, Ititiicnit<!, Sumae.  
T<. 41/38 23 26 00. Fax 41/38 23 26 01.

Irûmat : Mtp : .AwW^urm>.ck^iia97/.

16-29 août 1887  
ThtMaioniqu<, Grée@  
> i l ütftK>m A^aéffio% @f öw totar.  
it<tbc<«i Astsociatitm off s^i&moioy  
and pliyiéd of th@ ESMIC@ fflah<«>  
— 2Sill IASPB perwAi \*ss<mWY geo-  
physics! ^aïraioy. University. GR -  
54006.TIMNMMitoniU. Orée<. Tél. 30/  
31 998 926. Fax 30/31 998 526.  
E-mail : ^spe^otymp.ccf.suñh.gr.

\* 28 août - 3 sept. 1997  
00100<<< Raut  
âIO IVfi Intsmatlonai Conférence  
on Gacnorp>>ok>gy.  
~ P&m Fofti, Fternling Coogressi. via  
Crociali 2. 1-40136 Sologn\*. Italie.  
fax ia 38< 1 ^ 45 22.

1^5 tapi 1997  
iitantoui TufcM<  
Symposium li^l<m<ntional on Oaio^  
togy and aiwiwwiwi\* \*^> n^ 5ill  
— GEOEW97, MumaticMiaï sympo-  
skjm 9008C<«nca. PK 4&4 Yen,seh<-,  
06444 Ankara, Turquie. Tél.  
00/312 434 36 01. Fax  
90/312 434 23 88. E-mail ;  
>dogan@joo.Turi.ckj<tr.

\* 2-4 s#pt 1997  
Londres, G-8  
Ttmfwlimg m (Conf^renc< and «xhh

— Wcanferonc@ Office, Th< hstitu-  
tim of Mining ami Metafçjry, 44 Port-  
laüd Place. Londres WIN 4B.R. G.-3.  
Tél. 44/17 15 80 38 02.  
Fax 44/17 14 36 S3 66.

7-10 Blpt. 1997  
Vtem, friche  
ÄAPG - International Conf^r<fie<  
and<Kftto^oon.  
— AWFG. CoWÄrtion Oapt. BOK §79,  
Tuisa, 0<- 7410t. OSA. Tél.  
1/918 5 > 26 79, Fax 1/918 560 26 64.

21-3? sept 1997  
Nottingham. G.-B.  
GroundwaxM >n tha Urten Environ-  
mm% XXVÜth Congrawa of IAH

— SMphtn Fottar, Co>«fwno8 Nottav  
# a m , 30@ Ha<<<<< Rotd, l^\*tt^ MW  
msiAZ. a - a. m.44 / 1159556545.  
Fax 44/11 S3 85 6615.

\* 26-2> oet 1997  
Londret. G.-B.  
fNHtotwuift ppolfi^f of YW SLBTq^<-  
— CASIL, 4 Cavendish Squ<«r<,  
Londr<«>, WIM OBX, G.-S  
Tél. 44/17 14 99 09 00.  
Fan 44/1716 29 32 33.

1998

\*@-12Juli1988  
Leipzig, Mwiügm  
Ei^mp^afi A^TOE. of G^o^ch&nUats  
ft Enginar> (EAGE), 60th! Confe-  
rence.  
— EAGE, EH. Bomkamp, PC Box 298.  
W 3700 A0 Zaist, Pay-Baa.  
Tét 31/3080 62 8S5. fm 31/3069 62 640.

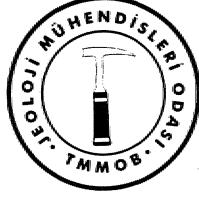
29 K>n-18 MI. 1993  
Johannösixxrg, Afrique c&i Sixi  
8th int^maMortal plsiinum sympo-  
sium (UGOO/CODMUH).  
— CA Im> PO BOX 68103. Bryamton>  
Soutfi Africa, Tii, 27/11 3F3 25 80.  
Fax 27/11836 03 71.

9-15 août 1996  
Toronto, Canada  
kntomaioimi Mtnrelctgtoal As<ocia-  
löft ; lüAHA  
— A.J. Nalcirefi. Oopt Gëotogy. Univ-  
«rsity of Toronto, Camda lui SS 3B1.  
Tél. : 1/410 978 30 30.  
fan 1/416 978 39 38. E-mail :  
fftTiaSe^ouartz.geologv^iüChrontoDa.

20-26 août 1998  
MontpöHw, France  
18^ Congrès mondliiriém Bcimmem^  
duaol. i^ n^57.  
— CMEAfC, 1@- Corn^éa momm d<  
SCH&TTC du toi. Av. «f Agrap@)», B.P.  
50 98. Afropoila 34 394 Montpëitor  
(Xiex, Franc<. Tél. 33/67 04 75 34.  
Fix 33/67 04 75 49. E-mail :  
Iss&öagropoiiüJr. S<rveyrwww :  
http iwww.cirad.-if ./isas.html.

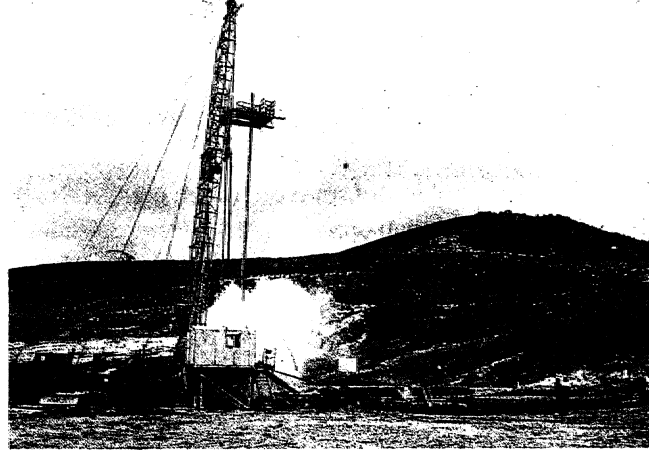
\* oel - nov. 1998  
PhysJcei, cbemlecat and biological  
asphStia of \*qt^tfw->tr<nm s^d<«nt  
lnhwratotiOfa, aiüi. IAH Cono^««<.  
— J. Roöochem, USGS MS 414, Na-  
tional Centar, ffast-Dn Va 22092, USA.  
Fax 1/703 646 57 22.

**TMMOB  
JEOLOJİ MÜHENDİSLERİ ODASI**



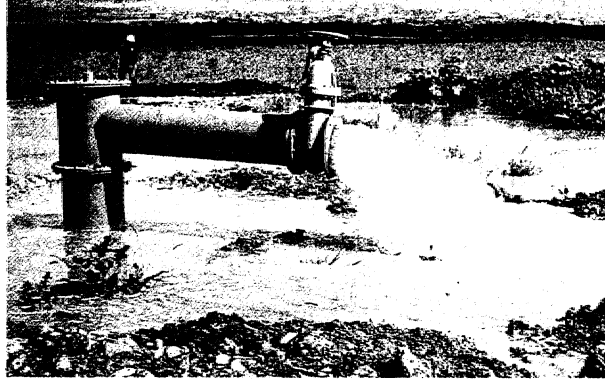
**TÜRKİYE JEOLOJİ KURULTAYI'NIN  
50. YILI ETKİNLİKLERİ**

**JEOLOJİ MÜHENDİSLİĞİ VE  
SONDAJ UYGULAMALARI  
SEMPOZYUMU**



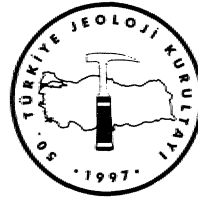
**DSİ GENEL MÜDÜRLÜĞÜ  
KONFERANS SALONU  
17 - 19 ŞUBAT 1997**

# YERALTISULARI SEMPOZYUMU



2 - 4 NİSAN 1997

50. TÜRKİYE JEOLojİ KURULTAYI  
ETKİNLİKLERİ



TMMOB  
JEOLojİ MÜHENDİSLERİ ODASI

DSİ GENEL MÜDÜRLÜĞÜ  
KONFERANS SALONU

