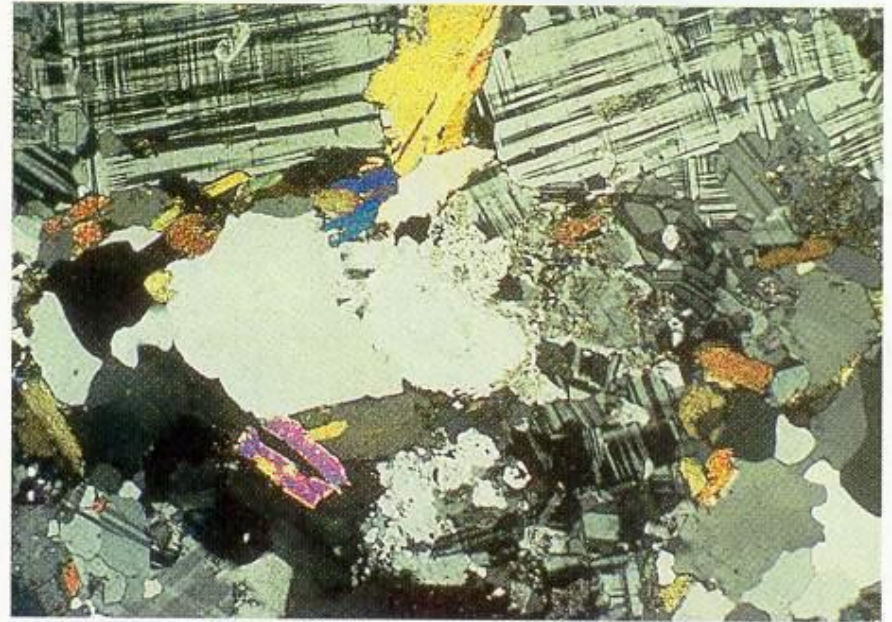


KÖMÜR PETROGRAFİSİ



A.



B.

Figure 3.2 A. Close-up of interlocking crystals in a coarse-grained igneous rock. The largest crystals are about 1 centimeter in length. B. Photomicrograph of interlocking crystals in a coarse-grained igneous rock. (Photos by E.J. Tarbuck)

LİTOTİPLER

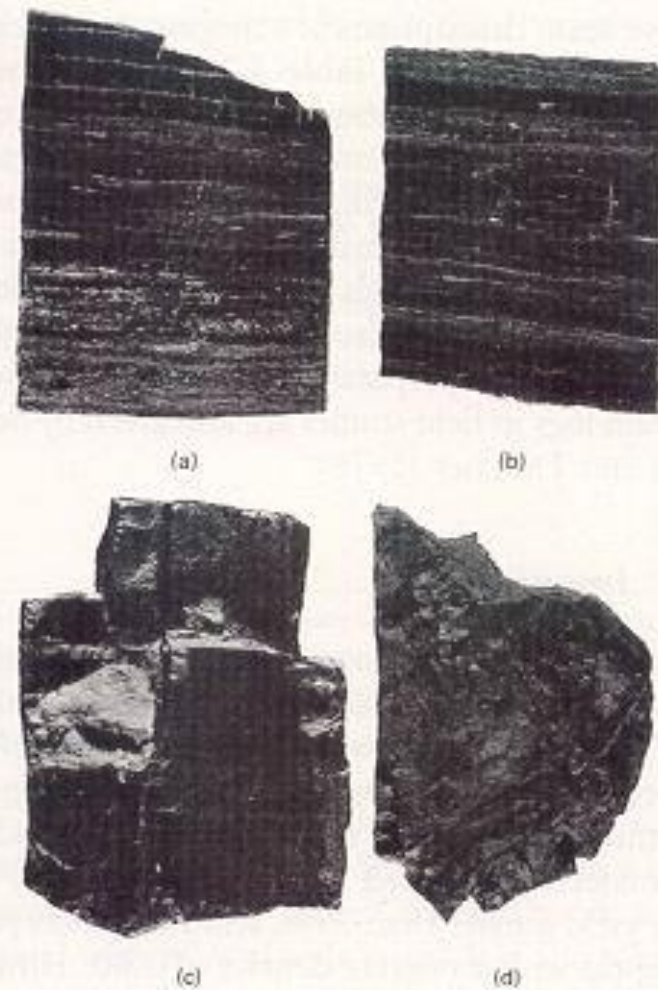


Fig. 3.1 Lithotypes in banded bituminous coal. (a) Vitrain in polished surface. Note that the three bands of vitrain at the top of the block are more highly jointed (cleated) than the rest of the coal ($\times 0.8$). (b) Clarain in polished surface. The lower three quarters of the block are composed mainly of clarain; the upper quarter consists of two durain bands (grey) and a vitrain band (black) ($\times 0.8$). (c) Durain in hand specimen ($\times 0.3$). (d) Fusain in bedding surface of hand specimen ($\times 0.2$).

MASERAL GRUBU		LİPTİNİT (L)	VİTRİNİT (V)	İNERTİNİT (I)									
YOĞUNLUK		1.15	1.30	1.45									
YANSITMA		0.5	0.70	1	2 3 4								
YANSİYAN IŞIKTAKİ RENGİ		SIYAH	AÇIK GRİ	BEYAZ									
FLORESANS		SARI → KAHVERENGİ											
% KARBON		75	80	85	90								
MAKROSKOPİK	LİTOTİPLER (-EN eki)												
MİKROSKOPİK	TEK MASERALLI												
	İKİ MASERALLI												
	ÜÇ MASERALLI												
MASERALLER (-İNİT eki)	SPORİNİT (mikro ve mega-sporlar)	KÜTİNİT	RESİNİT	ALGİNİT	TELİNİT	KOLLİNİT	VİTRODETRİNİT	FÜSİNİT	SEMİFÜSİNİT	MAKRİNİT	İNERTODETRİNİT	MİKRİNİT	SKLEROTİNİT

Tanım	Ayırt edici özellikler					
Kaba yapı	Litotip	Tabakalanma	Yarılabılme	Kırılma şekli	Görünüm	Diğer özellikler
Kömür	Vitren	Zayıf	İyi	Küp şeklinde, kısmen konkoidal	Çok parlak - parlak	Tabakalanma yönüne dik çok sayıda çatlakları bulunur
	Düren	Zayıf	Kötü	Düzensiz	Mat	Bantların yüzeyleri pürüzlü olup genellikle gri ve siyah görünüşlüdür
	Füzen	Bantsız	Yok	Düzensiz	Mat - ipeğimsi	İpeğimsi, lifsi dokuya sahip, yüksek oranda mineral içermekte, eli boyayan tek litotip
	Klaren	İyi	Orta	Vitren ve dürenin özellikleri arasında değişir		Vitren, düren ve/veya füzenin ince bantlarının ardalanmasından oluşur. Bant kalınlığı 1 cm'den küçüktür
Killi kömür	Belirgin	Kırılma	Renk		Çizgi rengi	Kömür ve kil taşı ardalanması, kil taşı kalınlığı 1 cm'den küçüktür
			Gri çizgili siyah			
Kömürlü kil taşı	Belirgin		Siyah çizgili gri			Kömür ve kil taşı ardalanması, kömür kalınlığı 1 cm'den küçüktür
Karbonlu şeyl	Kötü	Düzenli değil	Koyu kahverengi - siyah		Kahverengi	Kömür ve kil taşı karışımı

MASERALLER

Kahverengi kömür (linyit)				Bitümlü kömür			
Maseral Grubu	Maseral Altgrubu	Maseral Tipi	Maseral Tipi	Maseral Tipi	Maseral Grubu		
hüminit	hümotelinit	tekstinit ülminit	teksto-ülminit ö-ülminit	telinit 1 telinit 2	telinit	vitritit	
	hümodetrinit	atrinit densinit			vitrodetrinit		
	hümokollinit	jelinit	levijelinit porijelinit	detrojelinit telojelinit öjelinit	desmokollinit telokollinit jelokollinit korpokollinit		kollinit
		korpo- hürminit	filobafinit psöydo- filobafinit				
liptinit (= eksinit)		sporinit kütinit resinit alginit fluorinit liptodetrinit				liptinit	
inertinit		füsinit semifüsinit mikrinit makrinit sklerotinit inertodetrinit				inertinit	

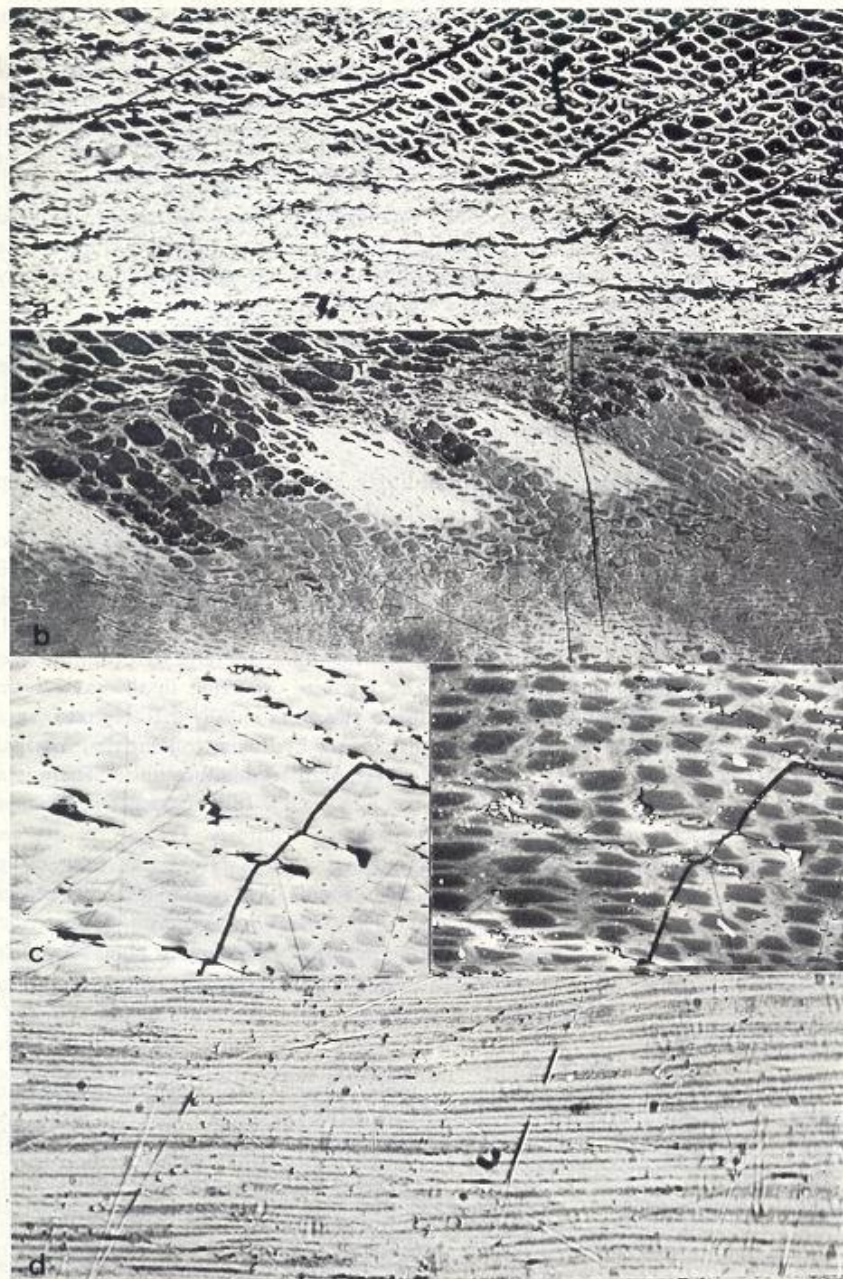


Fig. 28. Telinite: a) Telinite from a Triassic (Keuper) vitrain without cell fillings, polished surface, oil imm., 135 x; b) *Sigillaria* periderm from a Carboniferous high-volatile coal, polished surface, oil imm., 150 x; c) vitrinite (telinite and gelocollinite) from a high-volatile bit. Ruhr coal, polished surface; left side: oil imm.; right side: methylene iodide imm., 150 x; d) vitrinite (telinite) from a high-volatile bit. Ruhr coal, polished surface, oil imm., 350 x.

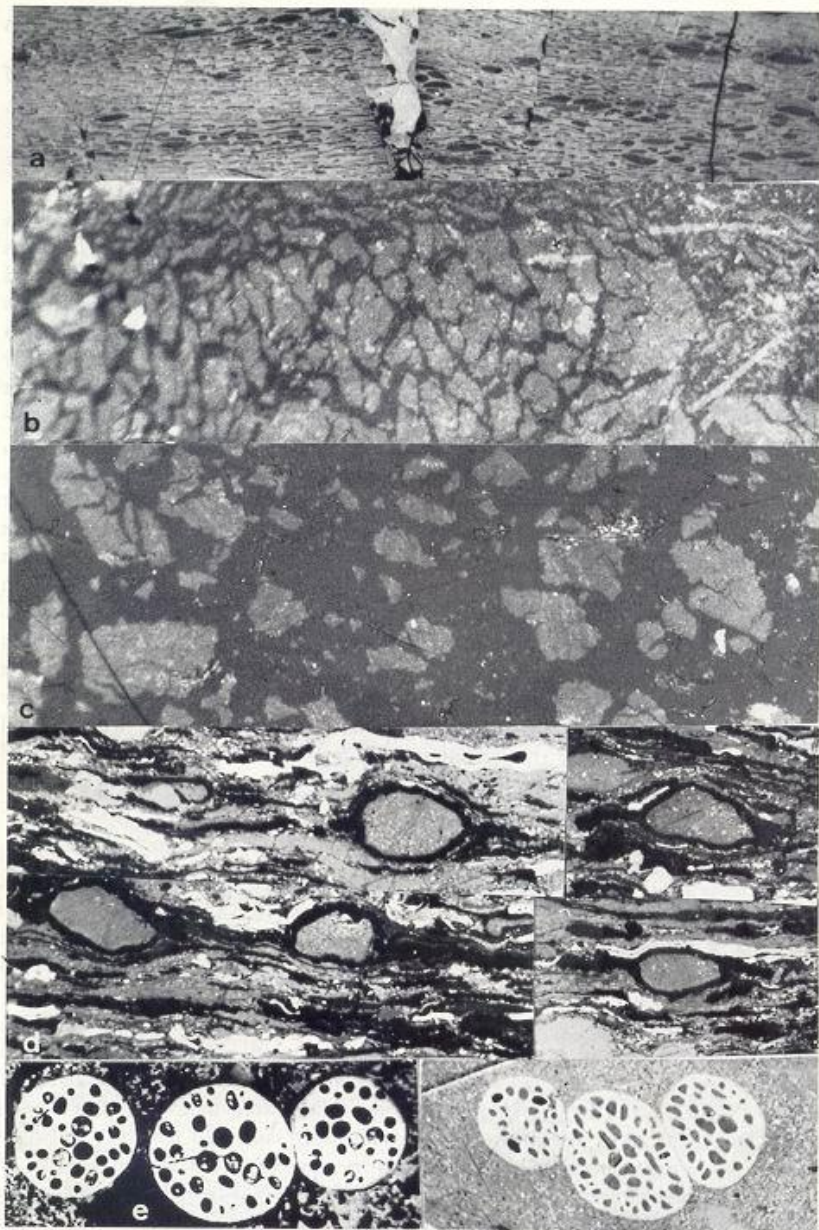


Fig. 29. Collinite, vitrodetrinite: a) Light gelocollinite (filling a fissure) in a high-volatile coal from Turkey, polished surface, oil imm., 100 x; b) dark gelocollinite and vitrodetrinite from a high-volatile bit. Ruhr coal, polished surface, methylene iodide imm., 500 x; c) Same as b), larger vitrodetrinite particles; d) gelocollinite as filling of microspores in a high-volatile bit. Ruhr coal, polished surface, oil imm., 500 x; e) left: Sclerotia with void chambers in Tertiary soft brown coal from Palembang (Sumatra); right: Sclerotia with chambers filled with gelocollinite in hard brown coal from Palembang (Sumatra), polished surface, oil imm., 350 x.

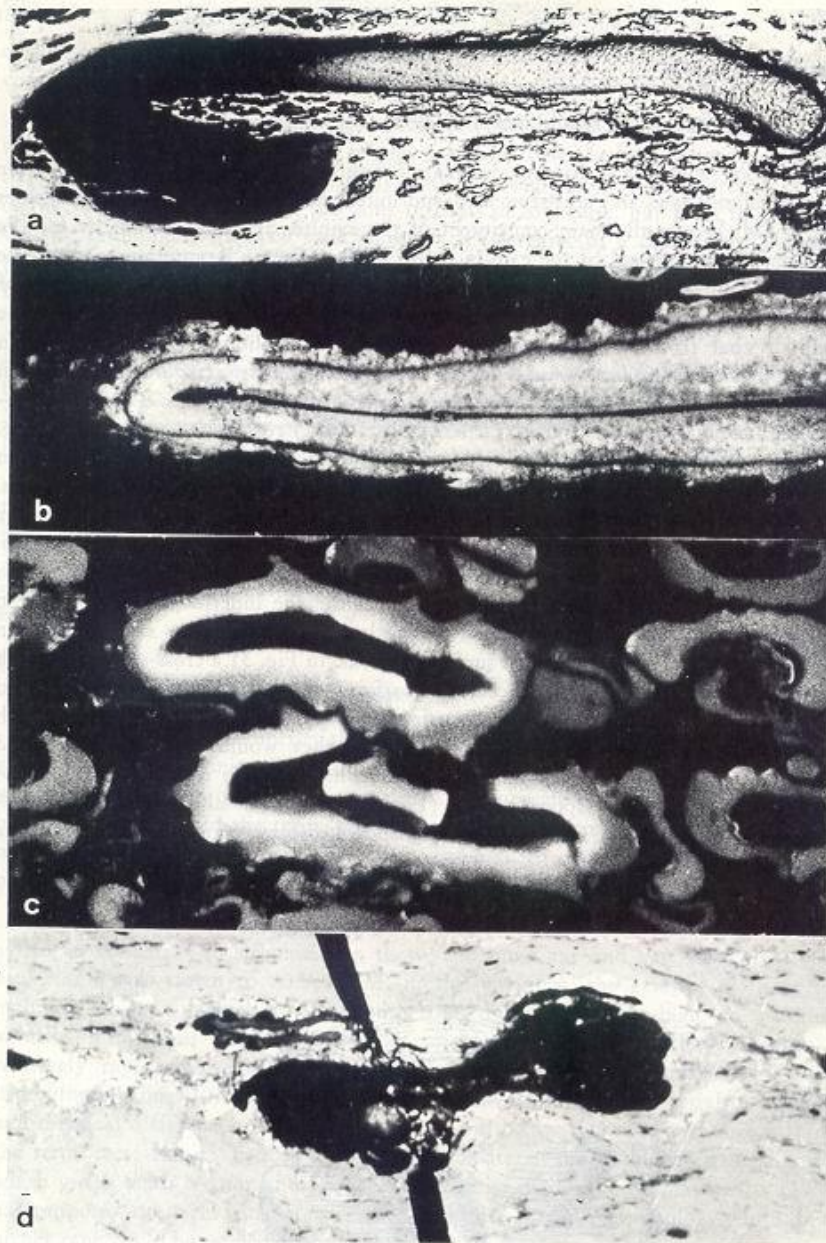


Fig. 32. a) Megaspore from a high-volatile Ruhr coal. Left side: normal appearance; right side: etched by radioactive α -irradiation, polished surface, oil imm., 150 x; b) megaspore with perispore from a high-volatile Ruhr coal, polished surface, dry, fluorescent light, 625 x; c) microspores with double-layered exine (layers without distinct limits) from a Moscow lignite surrounded by Patinati spores displaying weaker fluorescence, polished surface, dry, fluorescent light, 800 x; d) microspore from a high-volatile Ruhr coal. The spore has not been disrupted by the shrinkage fissure, polished surface, oil imm., 2000 x.

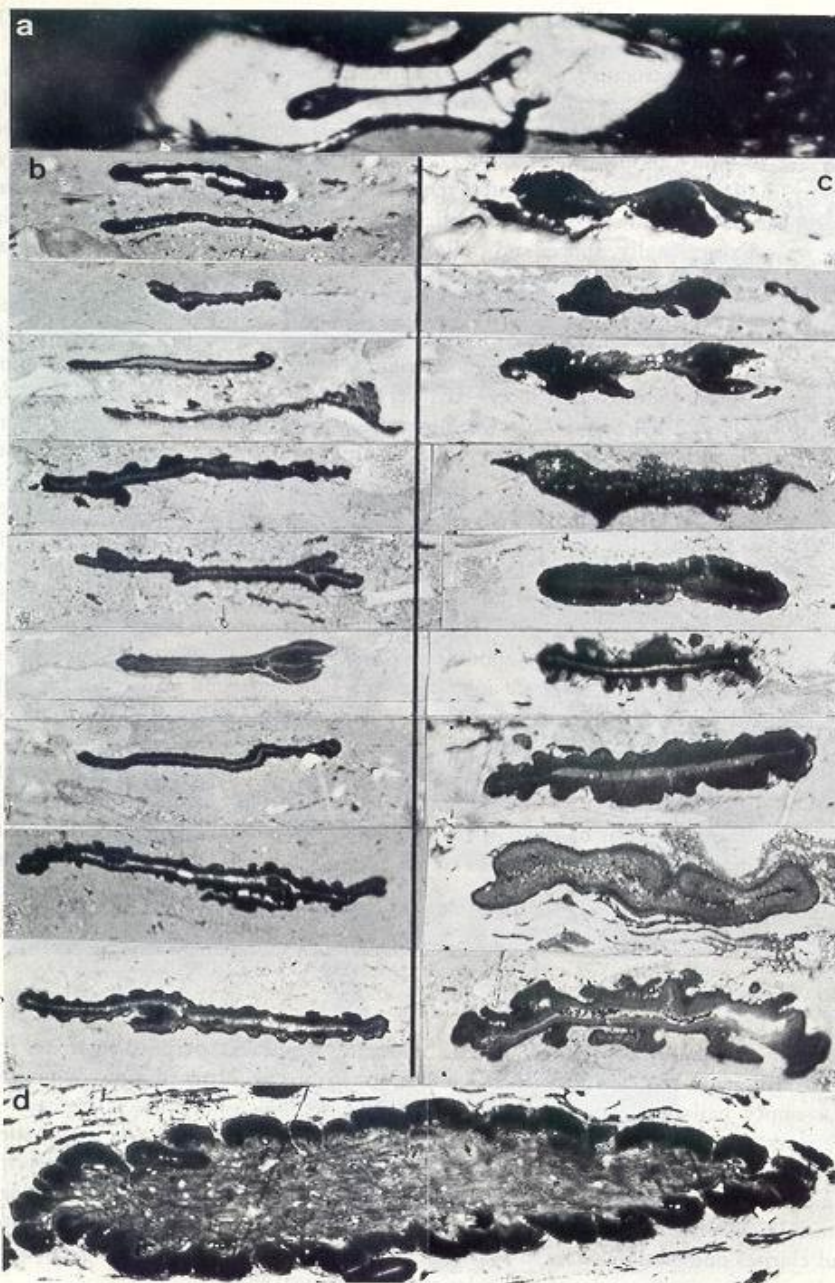


Fig. 33. Tenuisporinite, crassisporinite: a) Fusinitized microspore from a high-volatile Ruhr coal, polished surface, oil imm., 2000 x; b) microspores (tenuisporites) from a high-volatile Ruhr coal, polished surfaces, oil imm., 1000 x; c) microspores (crassisporites) from a high-volatile Ruhr coal, polished surfaces, oil imm., 1000 x; d) the Sporangium *Bicoloria* U. HORST (The outer wall is formed by *Torispora* forms) from the Olsnitz coalfield in Saxony (Germany); polished surface, oil imm., 350 x.

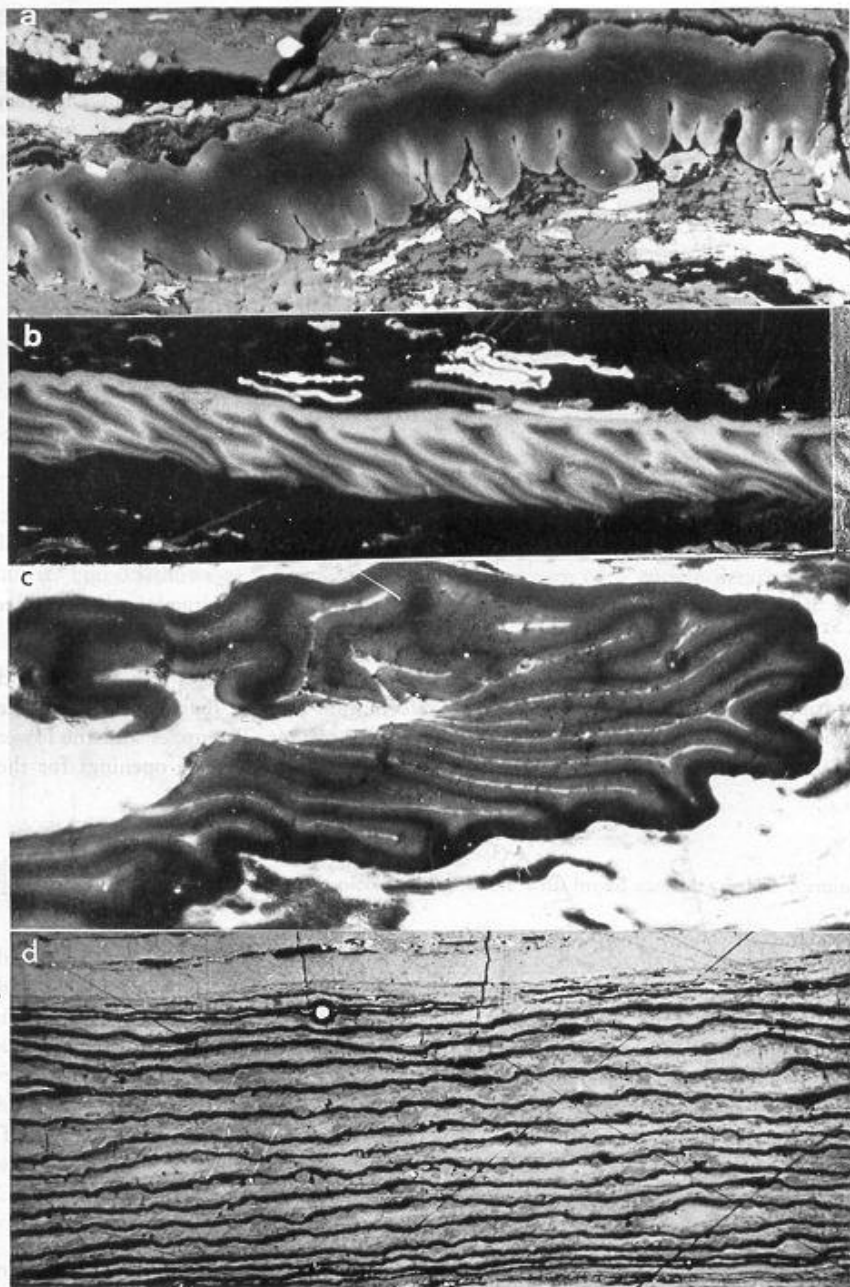
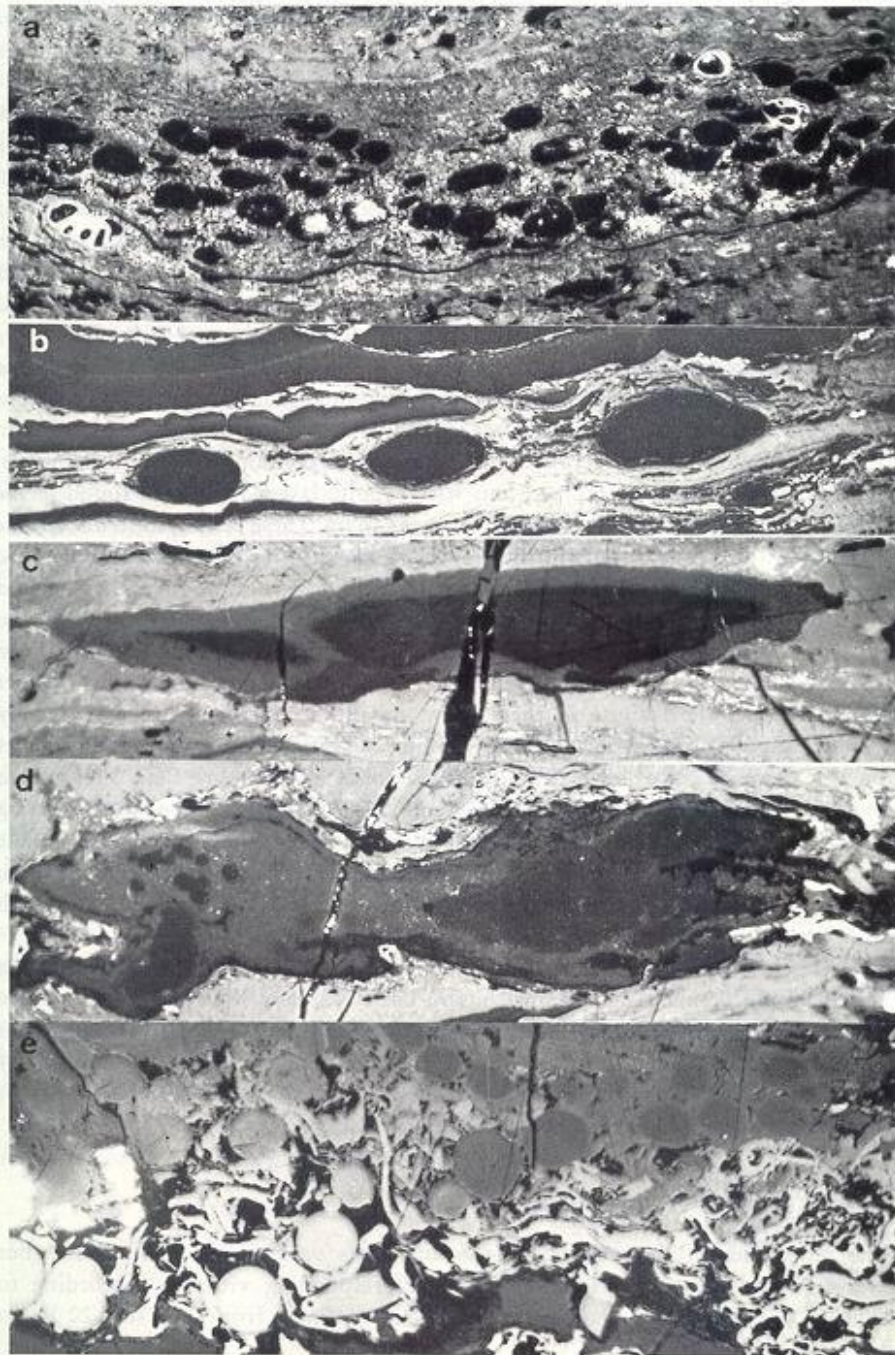


Fig. 38. Cutinite: a) Thick-toothed cuticle (crassicutinite) from a Turkish high-volatile coal, polished surface, oil imm., 500 x; b) cuticle with cuticular ledges from a high-volatile Ruhr coal, polished surface, dry fluorescent light, 500 x; c) cuticle with cuticular ledges. Polished surface, oil imm., 1050 x; d) thin-walled untoothed cuticles (tenuicutinite) from a high-volatile Ruhr coal, polished surface, oil imm., 150 x.



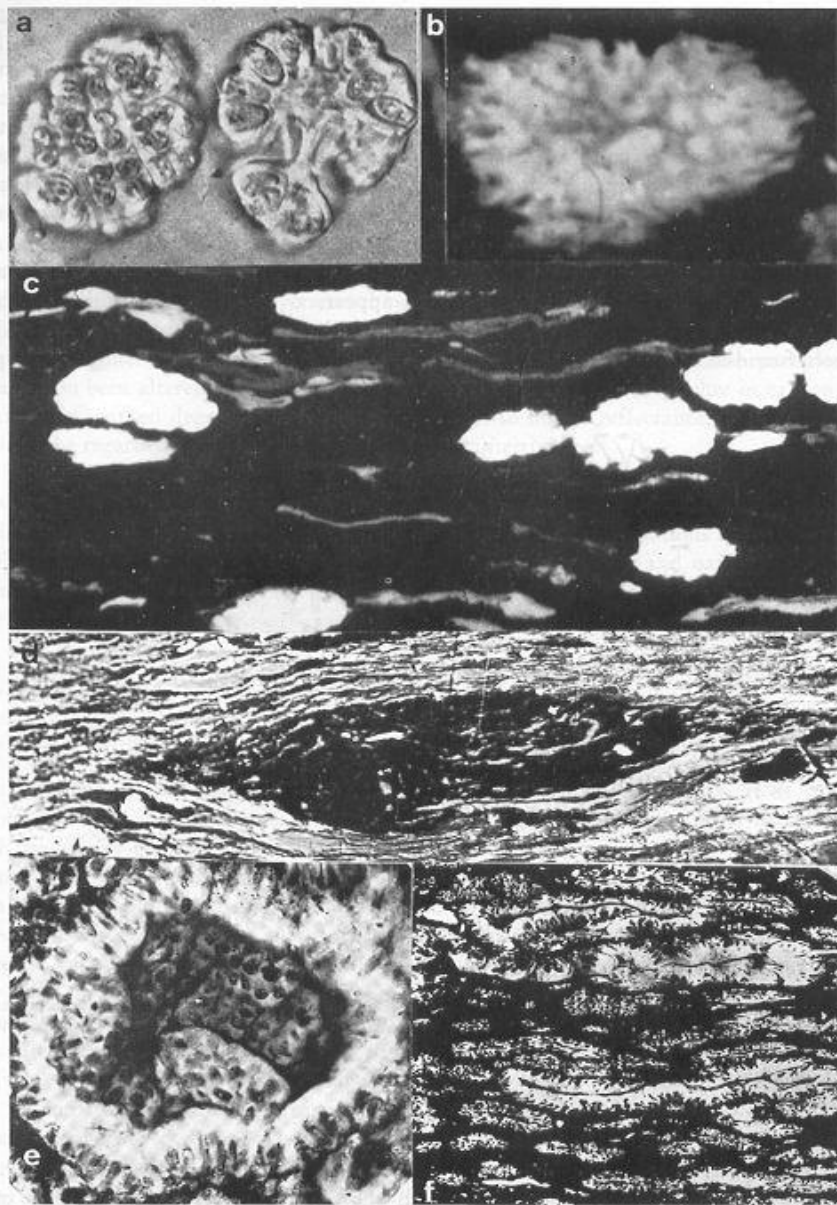


Fig. 42. Alginite: a) Two recent algae colonies of *Botryococcus braunii* in transmitted light, embedded in Canada balsam, 1000 x (after BLACKBURN & TEMPERLEY, 1936); b) colonies of *Pila* algae from Scottish Torbanite, polished surface, oil imm., fluorescent light, 1000 x; c) colonies of *Pila* algae in boghead coal from a high-volatile Ruhr coal, polished surface, dry, fluorescent light, 1000 x; d) large compressed colony of *Pila* algae in cannel coal from the Saar coalfield, polished surface, oil imm., 400 x; e) colony of *Reinschia* algae, cut parallel to the bedding, from Scottish Torbanite, transmitted light, 300 x; f) *Reinschia australis* in silicified Australian boghead coal with compressed voids; thin section, 140 x (after BERTRAND, 1930).

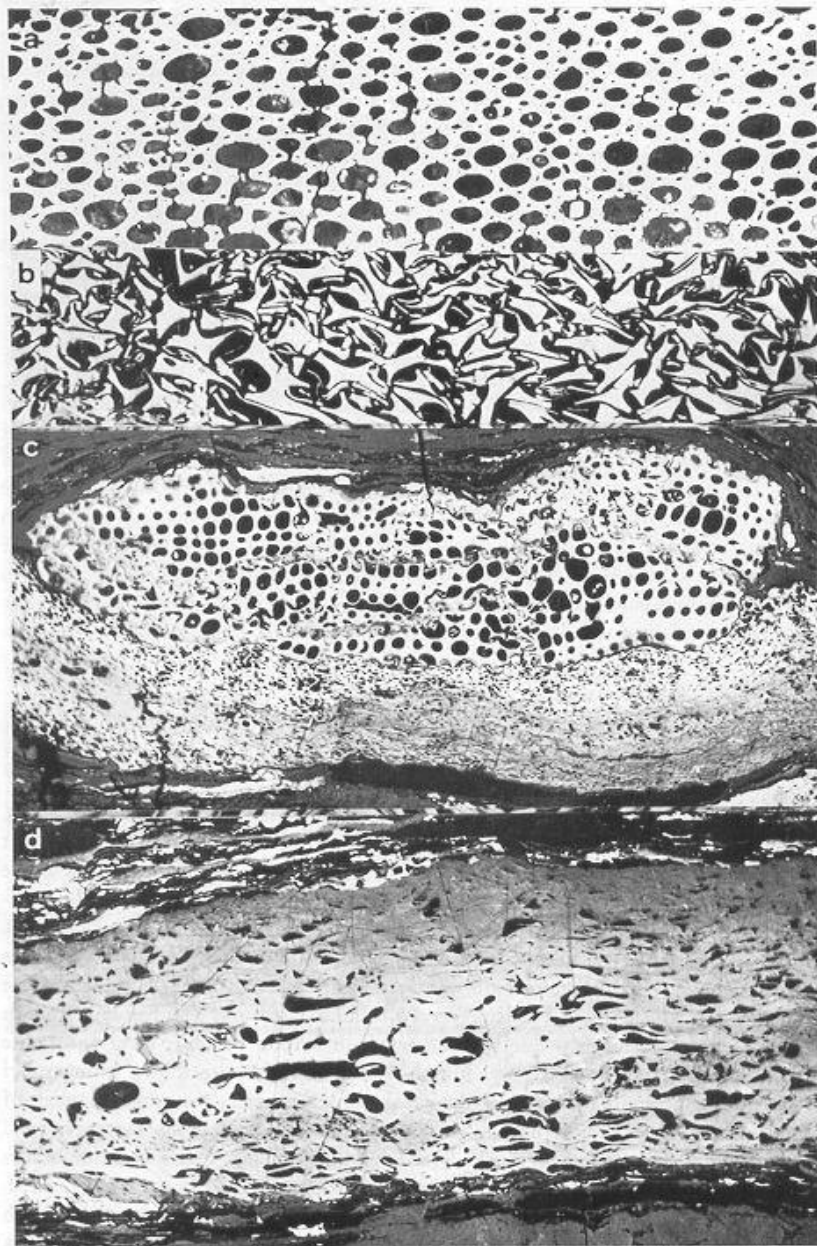


Fig. 45. Fusinite and semifusinite: a) Fusinite showing 'sieve structure' (in German 'Loch-siebgefüge') with void dark cells and intercellular spaces in a tonstein from the Saar coal-field, polished surface, oil imm., 375 x; b) fusinite showing 'bogen' structure (fractured cell walls) from a high-volatile Ruhr coal, polished surface, oil imm., 300 x; c) fragment of fusinite (top) pushed into semifusinite (bottom) from a high-volatile Ruhr coal, polished surface, oil imm., 150 x; d) semifusinite from a high-volatile Ruhr coal. Transition from vitrinite (grey, top) to semifusinite, polished surface, oil imm., 150 x.

MİKROLİTOTİPLER

Mikrolitotipler	Bileşim (%)
Tek maseralli mikrolitotipler Vitrit Liptit İnerit	Vitrinit (V), > % 95 Liptinit (L), > % 95 İneritinit (I), > % 95
İki maseralli mikrolitotipler Klarit Vitrinertit Dürit	V + L, > % 95 V + I, > % 95 I + L, > % 95
Üç maseralli mikrolitotipler Düroklarit Vitrinertoliptit Klarodürit	V > I + L (her biri en az ≥ % 5) L > I + V (her biri en az ≥ % 5) I > V + L (her biri en az ≥ % 5)
Karbomineritler Karbarjilit Karbopirit Karbankerit Karbosilisit Karbopoliminerit	Kömür + hacimce % 20-60 kil mineralleri Kömür + hacimce % 5-20 demir sülfid mineralleri Kömür + hacimce % 20-60 karbonat mineralleri Kömür + hacimce % 20-60 kuvars Kömür + hacimce % 20-60 değişik mineraller

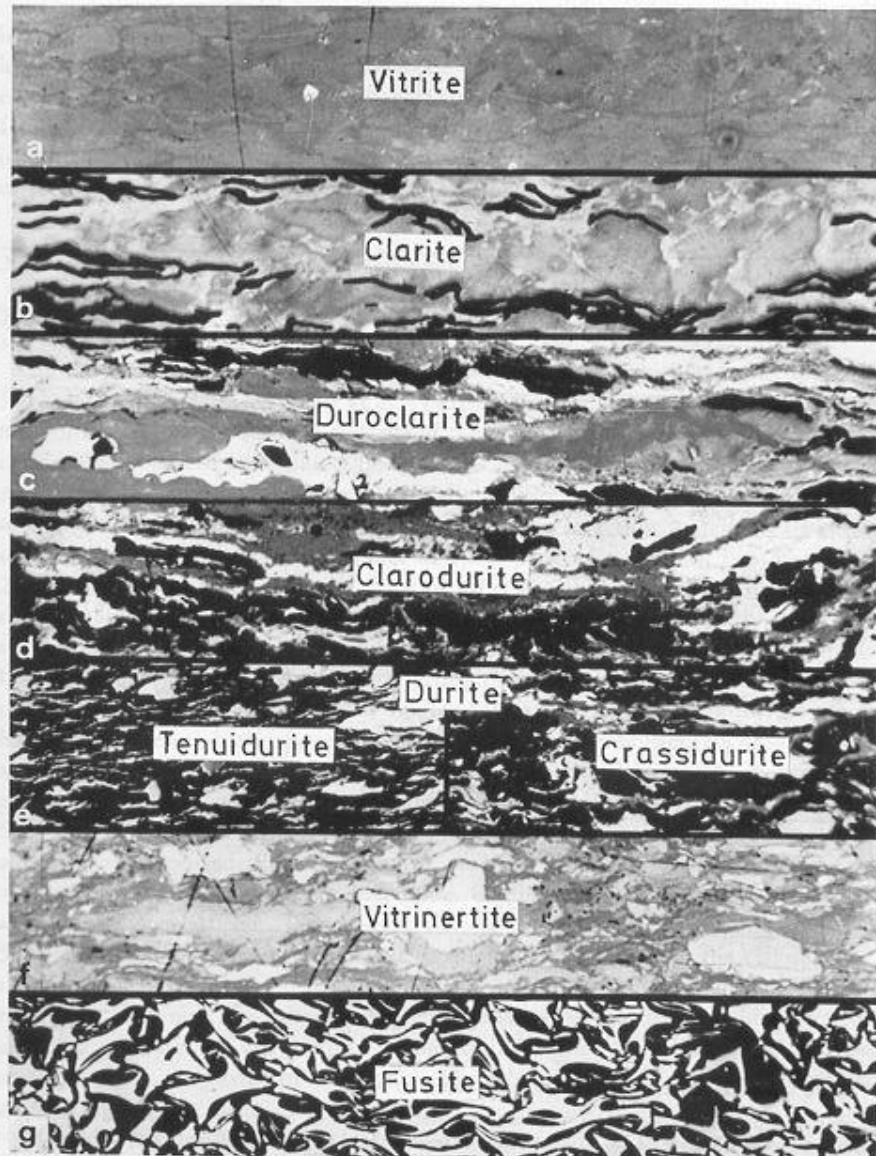


Fig. 50. Microlithotypes: a) Vitrite from a high-volatile Ruhr coal, polished surface, oil imm., 300 x; b) clarite from a Saar coal, polished surface, oil imm., 300 x; c) duroclarite from a high-volatile Ruhr coal, polished surface, oil imm., 300 x; d) clarodurite from a high-volatile Ruhr coal, polished surface, oil imm., 300 x; e) durite from a high-volatile Ruhr coal, according to the new classification (see Intern. Handbook of Coal Petrography, 1971) the tenuidurite and crassidurite of this specimen may be classified as vitrinertoliptite, polished surface, oil imm., 300 x; f) vitrinertite from a high-volatile Ruhr coal, polished surface, oil imm., 300 x; g) fusite showing 'bogen' structure from a high-volatile Ruhr coal, polished surface, oil imm., 300 x.

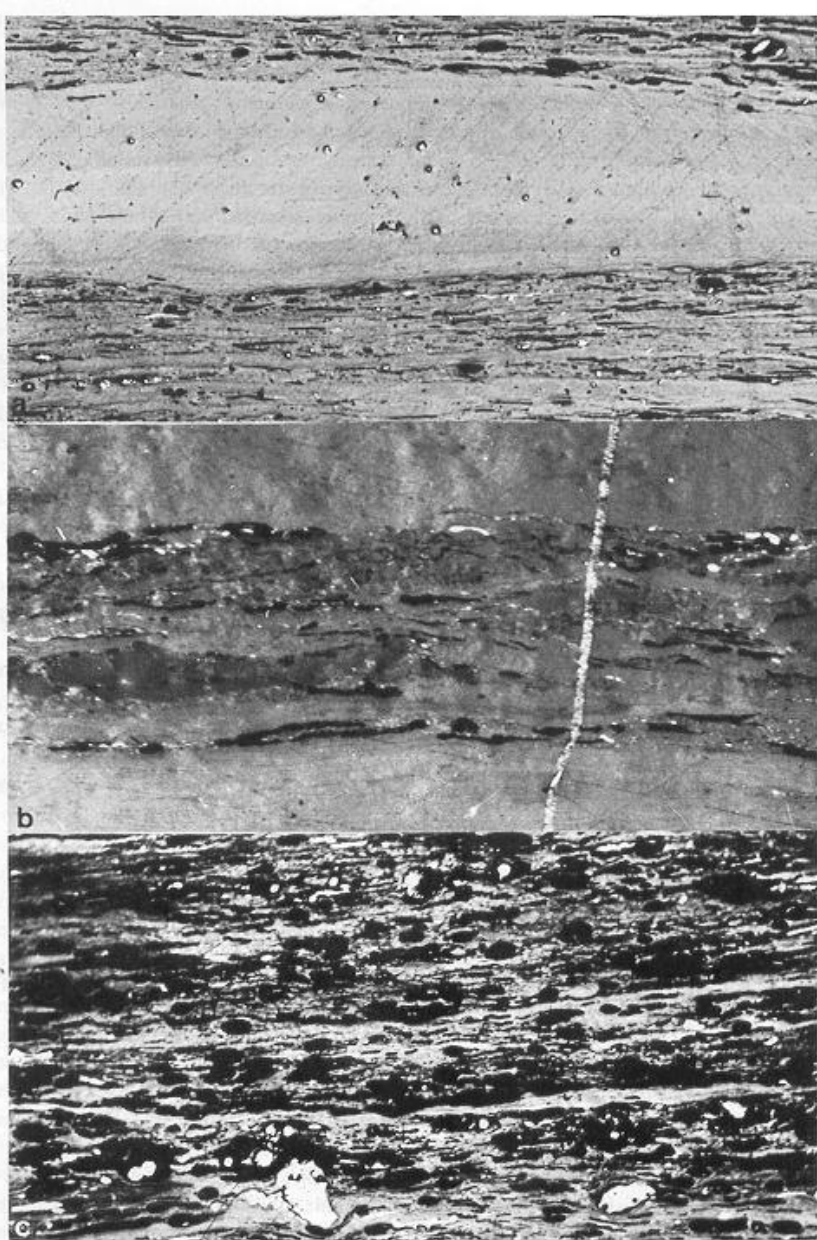


Fig. 51. Vitrite, clarite: a) Vitrite from South African Gondwana coal between clarite layers, polished surface, oil imm., 150 x; b) layer of clarite surrounded by vitrite from a high-volatile Ruhr coal, the vitrinite in the clarite is composed of light grey (vitrinite A) and dark grey particles (vitrinite B), polished surface, methylene iodide imm., 350 x; c) crassiclarite with a thick-walled *Torispora* (*Torispora*-clarite) from the bottom seam of the Saxonian coalfield, polished surface, oil imm., 150 x.

VİTRİNİT/HÜMİNİT YANSITMASI

