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Enclosure 2 - Selected spore ranges and spore zonation of the Carboniferous system in Western Europe

Comments on Systematics

(The following brief notes are supplied to clarify the taxonomic interpretations of certain species based on the range chart.)

1. *Hypnospores* spp. Mchegor 1960 - includes typical representatives of *Hypnospores* and *Anocyclus* affinitis *Decay & Neele* 1970, i.e. spores with a central body bearing an ornament of multilateral and multidentate prisms. The youngest occurrence is known in the upper part of the Pn zone in T 1 b (Namurian B.)

2. *Astraspores* spinosa (Náušová) SteiI in Br. y., 1974. Concept of species expanded to accommodate forms previously assigned to *Endospores* (E. minuta Hoppe, SteiI & Málková) and *Discospores*.

3. *Hymenosporites caucasicus* Heég in Br. y., 1974 (synonym of *Spicospores* sp. A. SteiI in Br. y., 1974). This species must not be confused with *S. hypnospores* (KieG) SteiI in Br. y., 1974, which is smaller and has a thicker exospore bearing small spore coats on the exospore (see Heég in Br. y., 1975, p. 599, for discussion). *Hymenosporites hypnospores* KieG var. *macrospores* KieG 1974, tab. 1, fig. 5, not fig. 4, could be considered a senior synonym of *H. caucasicus*.

4. *Bipolarites fluviales* (KieG) SteiI in Br. y., 1974. Western palynologists have frequently referred to this group of species as *Hymenosporites flavus* KieG 1957 (see NeveR & Decay 1967, PatRoth & Symm 1971 and Heég in Br. y., 1974 (where the species is erroneously credited to Náušová)). In material from New York State previously studied by MbrickT (in Tr.Project & Scott 1965), KieG & GauriN 1971 have referred to this species as *Triposporites flavus* KieG 1974 but subsequently reclassified this material to *Triposporites* (in Compositae) radiatus (Náušová) KieG 1974 b.

5. *Gymnospora coronata* Heég in Br. y., 1974. This species was distinguished by Heég in Br. y., 1975 from *G. unica* (HockG) in Br. y., 1971, chiefly by its larger overall diameter, a feature considered to be of little significance by Symm in Br. y., 1974.

6. *Spicospores* hypnospores (KieG) SteiI in Br. y., 1974. Western palynologists consider that representatives of this species bear sparse small coats on the exospore which appears to be restricted to the distal surface. Exospore palynologists however consider the exospore to be present but less discernible on the proximal surface. Coats are considered discernible only in the variety *Spicospores* unicus Heég in Br. y., 1971. The concept of this species in the present work includes this variety as well as varieties minor KieG, in KieG and GauriN 1971 and major KieG 1963, both of which were differentiated by their smaller size. However, variation macrospores KieG 1974 is not included and subsp. *KieG 1974 a* are not included (the latter being considered a synonym of *Spicospores* sp. in Baker & Heskell 1962).

7. *Valpostrites parvus* (KieG) Decay & Neele 1970. The concept of this species applied here conforms to the currently held opinions of western palynologists that a sparse bearing an ornament of relatively large spore spine and often horn-elements must be separated from taxa bearing ornamentation of verrucate, spines and numerous minute spore elements. This does not agree with original concept of *Hymenosporites parvus* KieG 1957 which would readily accommodate *V. spiculatus* HockG and *V. serratus* HacKman.

8. *Conispores* sp. A. The majority of the specimens observed are very dark making distinction between *C. annulatus* (Walter) Bresseri & Venkatakula 1962 and *C. holothecatus* (Lemée Solodov 1964) frequent impossible.

9. *Hymenosporites explorator* (Lemée KieG 1963). Zoosporites exploratori Lemée in Walter 1941, tab. 1, fig. 4 has a different density of ornament to that present in the specimens illustrated by KieG 1963, tab. 5, fig. 6, where fig. 14 and 15 possess small rather than wide and an ornament whose size and density is comparable with the material illustrated by western palynologists.

10. *Bipolarites constrictus* Solodov 1962. *Bipolarites extrinvisus* KieG 1963 could be considered the senior synonym *R. constrictus* if it is accepted that some of the specimens figured by KieG 1963 (tab. 5, fig. 38 and the specimen figured on the dominant species chart) has an ornament of short and variedly shaped elements and a triforce mark extending 1/4 of the spore radius.

11. *Distosporites spinulosus* KieG 1963. *D. spinulosus* is distinguished from *L. constrictus* (Lemée KieG 1957 on the basis of the relatively broad, large-convex lateral of the latter species, the stratigraphic range of the two taxa are quite different, at least in the British islands.

