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## Species identification of fossil pollen and spores by size-statistical methods

By SVEND TH. ANDERSEN

Based on material from interglacial deposits from Western Jutland it was demonstrated, how species abundance could be indicated by bimodal size-frequency curves. As examples were shown such curves for microspores of *Isoëtes* (representing the species *echinospora* and *lacustris*), pollen tetrads of *Empetrum* (*nigrum* and *hermaphroditum*) and pollen of *Betula* (*nana* and *pubescens*).

Diskussion. K. FAEGRI: Geographical variation in pollen grain size within one species has been demonstrated in USA by CAIN. Variation with the physiological state of the plant have been demonstrated for *Corylus* by SCHOCH-BODMER. In *Betula* Eneroth found no systematic differences with geographical position with the species concept of Gunnarsson upon which Eneroth relied. However, if we include Gunnarsson's *Betula tortuosa* (about which hardly any Scandinavian botanist feels happy) in the *Betula pubescens* group, the situation becomes more difficult. Even if the possibility of specific identification may be doubtful, a correlation of size with certain ecological factors might nevertheless prove of great value for the utilisation of pollen spectra.

Diskussion. P. B. SEARS: What studies have been made to find out the effect, if any, of temperature (and other factors) upon cell size in pollen? — S. Th. ANDERSEN: Our knowledge about this question is quite incomplete. A few experimental investigations exist mostly however on unprepared pollen grains. WAGENITZ (Ber. Deutsch. Bot. Ges. 48, 297—302) in experiments with *Triticum*, *Secale* and *Avena* has shown that acetolysed pollen exines from very poorly developed plants are somewhat smaller than exines from fully developed plants. In subnormal plants the difference is hardly appreciable. The effect of temperature in itself would be difficult to distinguish from other factors. Usually the variability within naturally grown plants of different geographical origin is small and the example shown by CAIN and CAIN (Bot. Gaz. 110, 135) probably so far is unique, but it is unknown whether the variability found by these authors is due to physiological or genetic conditions.

## Phase-contrast photography of Pollen

By SVEND TH. ANDERSEN

With diapositives was demonstrated the usefulness of phase-contrast microscopy in species identifications of pollen of *Plantago*, *Urtica* and *Alismataceae*.

Diskussion. G. ERDTMAN: Phase contrast microscopy is also instrumental in the identification of graß pollen grains and will probably be applied in tracing, in greater detail, the history of the cereals (cf. Grana Palynologica, N. S. Vol. I:2, 1956, pp. 134. 135).