

that there is a good deal of infraspecific variation. There are differences in the size and spacing of the poroids - those of the coarse Voifluss specimens are especially large (F.112). There is also variation in the degree of development of the transapical costae.

H. distinctepunctata is found in waters of very different salinities. Thus, it occurs at truly marine sites (Borth), in brackish habitats (see Kamijo & Watanabe 1974; these authors also supply a good illustration), and apparently also in freshwaters: Hustedt (1938) described it as a littoral form of alkaline lakes. It is interesting that Hustedt originally described it (1921) from a place which, from the occurrence of Cyclotella meneghiniana, Synedra ulna, Cocconeis placentula, Cymbella turgida, Nitzschia linearis and others, would seem to be a freshwater habitat, yet where there occurred in addition several brackish or marine forms, e.g. Achnanthes brevipes var. intermedia, Pleurosigma delicatulum, N. obtusa var. scalpelliformis, Bacillaria paxillifer (= Hustedt's 'B. paradoxa'). It would be useful to know more about the type locality than that the diatoms were on algae 'aus dem Voifluss unweit der Station Voi der Ugandabahn'! (Hustedt 1921).

With the finding of cells such as those from Borth and Sandbay it will be necessary to extend the presently accepted limits of H. distinctepunctata and an emended description will have to be developed.

4.5.9 Discussion

Mann (1977) considered that subgenera should be erected within Hantzschia in order to reflect the pattern of variation present, but these were not then described and no indication was given as to where the taxonomic boundaries were to be drawn. It is suggested here that two subgeneric groupings are present, one containing H. amphioxys and the majority^{of} Hantzschia species, the other containing, so far, only H. marina.

The H. amphioxys group contains a wide variety of forms, but all possess a similar valve construction with single rows of poroids alternating with the transapical costae, and there are always many fewer fibulae than transapical costae per valve: these matters serve to separate this group from H. marina. It will almost certainly be possible to subdivide the 'amphioxys-group', reflecting the variation in frustule symmetry, presence/absence of central raphe endings, fibula morphology, etc.

Although it is proposed that H. marina be separated from other species at subgeneric level, it should not be thought that this species occupies an entirely isolated position within Hantzschia. Mann (1977) noted that in several respects H. marina approaches members of the 'amphioxys-group', and in this connection it is most pertinent to consider the similarities between H. marina and H. distinctepunctata. Both of these have a biarcuate raphe system, noncoaxial-asymmetrical central internal raphe endings, similar polar raphe endings, a sub-marginal thickening of the valve at the pole, and fibulae which represent single subraphe costae: moreover, the subraphe canal is well-defined and raised, with non-porose walls. The valve structures differ, but LM observations of the larger, coarser forms of H. distinctepunctata suggest that even here the taxa are to some extent alike (compare F.1-4 with 112).

It can be seen that the cincture shows a fair amount of variation within this genus, but unfortunately it is not possible to say whether this is a common feature of raphid pennate genera since very few studies have concerned themselves with the cincture of these organisms. It is hoped that the account given above, together with the information below for Nitzschia etc. will serve as base-line data for future comparisons. It may be noted that the cincture structure in H. marina and H. virgata does not seem to uphold the views of Müller and Von Stosch

(e.g. Von Stosch 1975) that girdle elements may be divided into valvocopulae, copulae and pleurae. Applying Von Stosch's terminology to H. virgata, the last two bands must be called pleurae; the third band, because it is different from the fourth and fifth, must be called a copula, but then there is no name left for the second band (which is unlike the third) since the second is not adjacent to the valve and thus cannot be a valvocopula. Clearly further studies of the cincture are urgently needed.

The heterogeneity of the genus with respect to raphe and subraphe structure should also be noted: in this Nitzschia is similar. Again, however, there is a lack of comparable studies of other genera.