

1. Hantzschia marina: A2 population. x 3,400
Half-valve, * in valve view; note fibulae (f).

2. Hantzschia marina: A1 population. x 3,400
Half-valve, in valve view.

3. Hantzschia marina: C2 population. x 3,400
Half-valve, in valve view; note Voigt discontinuity
(arrow), reniform poroids.

4. Hantzschia marina: C1 population. x 3,400
Half-valve, in valve view.

5. Hantzschia marina: C2 population. x 4,350
Detail of valve, in valve view; note reniform
poroids.

6. Hantzschia marina: C2 population. x 4,350
Centre of valve, girdle view; note central raphe endings, hoops projecting above the surface of the valve, wider central interspace.
7. Hantzschia marina: C2 population. x 3,400
Cincture - detail showing distal (above) and proximal (below) aspects. Note the 5 bands (labelled 'a'-'e', 'a' being the 1st band) and their morphologies, especially the shapes, sizes and positioning of the poroids, and the transverse ridges on the 3rd & 4th bands; note also the differences between the distal and proximal halves.
('p i' = pars interior, 'p e' = pars exterior).
8. Hantzschia marina: C2 population. x 2,100
Theca, girdle view; note biarcuate disposition of raphe system.
9. Hantzschia marina: C2 population. x 3,400
Valve + 1st band, girdle view - details of poles; note the helictoglossa (h) and the submarginal thickening of the valve, the small pores near the valve pole, and the narrowing of the pars exterior of the 1st band near the poles (see also F.8).
10. Hantzschia marina: C2 population. x 3,400
Theca, girdle view - detail, first 3 bands visible; note differences between distal (left) and proximal (right) aspects.

11. Hantzschia marina: C2 population. x 3,400
1st band - ends; note that this band is closed
12. Hantzschia marina: C2 population. x 3,400
2nd band - closed end, and part; note difference between distal (left) and proximal (right) halves.
13. Hantzschia marina: C2 population. x 3,400
2nd band - closed end ('girdle view').
14. Hantzschia marina: C2 population. x 3,400
2nd band - open end.
15. Hantzschia marina: C2 population. x 3,400
3rd band - details of distal (left) and proximal (right) halves; on the distal half, note the narrow pars interior ('p i'), prominent ridge (arrow) and pars exterior ('p e') bearing large triangular poroids: contrast proximal half.
16. Hantzschia marina: C2 population. x 3,400
3rd band - closed end; note ligula.
17. Hantzschia marina: C2 population. x 3,400
3rd band - open end; note advalvar extension of the proximal half (right).
18. Hantzschia marina: C2 population. x 3,400
3rd band - open end; see F.17.
19. Hantzschia marina: C2 population. x 3,400
4th band - details of proximal (above) and distal (below) halves: 'p e' & 'p i' as above.

20. Hantzschia marina: A1 population. x 3,400
Valve, girdle view - centre; note differentiation of central interspace.
21. Hantzschia marina: A1 population. x 3,400
Valve pole, girdle view.
22. Hantzschia marina: A1 population. x 3,400
1st band - open end; note difference between proximal (left) and distal (right) halves.
23. Hantzschia marina: A1 population. x 3,400
2nd band - closed end; note ligula, and compare spacing of poroids with that on 1st band (F.22).
24. Hantzschia marina: A1 population. x 3,400
2nd band - open end; note expansion of the end of the proximal half (above).
25. Hantzschia marina: A2 population. x 3,400
Valve pole, girdle view; compare with F.21.
26. Hantzschia marina: A2 population. x 3,400
1st band - part; note difference between proximal (left) and distal (right) halves, in poroid spacing and width of pars exterior (pars interior not shown). Compare with F.22.
27. Hantzschia marina: A2 population. x 3,400
Valve + 1st band, girdle view - proximal aspect at pole; note that 1st band is open.
28. Hantzschia marina: A2 population. x 3,400
1st band - closed end, part and open end; note differences between proximal (below) and distal (above) halves, especially in widths of pars exterior and pars interior.
29. Hantzschia marina: A2 population. x 3,400
3rd band - distal half; compare with F.15-17.

30. Hantzschia marina: C1 population. x 4,350
Valve, girdle view - part; note Voigt discontinuity (arrow).
31. Hantzschia marina: C1 population. x 4,350
Valve pole, girdle view - proximal (left) and distal (right) aspects; note small pores near the helictoglossa.
32. Hantzschia marina: C1 population. x 2,100
Valve, girdle view; compare F.8.
33. Hantzschia marina: C1 population. x 4,350
Valve (left), distal side of cingulum (centre) and proximal side (right) - poles, in girdle view; note that 1st band is open (below), note differences between halves of bands, and the expansion of the proximal end of 2nd band (above).
34. Hantzschia marina: C1 population. x 3,400
Valve + first 3 bands, girdle view - part of distal side.
35. Hantzschia marina: C1 population. x 4,350
Valve + first 2 bands, girdle view - pole; closed end of 1st band, open end of 2nd; note expansion of proximal end of 2nd band (arrow).

36. Hantzschia virgata var. intermedia. x 2,100
(Llandudno material)
Valve, valve view; Voigt discontinuity visible in lower half, and note wide separation of the median fibulae.
37. Hantzschia virgata var. intermedia. x 2,100
(Barnstable material)
Valve, valve view.
38. Hantzschia virgata var. intermedia. x 2,100
(Barnstable material)
Valve, valve view; Voigt discontinuity visible in upper half.
39. Hantzschia virgata var. wittii x 2,100
Valve, valve view; compare with F.36-38.
40. Hantzschia virgata var. intermedia x 3,400
Central part of frustule, girdle view - proximal (left) and distal (right) aspects; note widths of cincture on either side, central raphe endings, and the thin, short fibulae.

41. Hantzschia virgata var. intermedia x 2,100
(Llandudno material)
Frustule, girdle view; note biarcuate disposition
of raphe system.
42. Hantzschia virgata var. intermedia x 2,100
(Barnstable material)
Frustule, girdle view; note the presence of a
slight longitudinal ridge (arrow) joining the
distal fibula bases.
43. Hantzschia virgata var. intermedia x 3,400
(Barnstable material)
Frustule, girdle view - pole; helictoglossae
visible.
44. Hantzschia virgata var. intermedia x 3,400
(Llandudno material)
Valve pole, girdle view - proximal (left) and
distal (right) aspects; note helictoglossa (h).

45. Hantzschia virgata var. intermedia x 3,400
(Llandudno material)
Part of 1st band - distal (left) and proximal
(right) halves; compare widths, poroid spacings, etc.
'p e' and 'p i' as before: note that the margin of
the pars interior is entire.
46. Hantzschia virgata var. intermedia x 4,350
(Llandudno material)
Cingulum, girdle view - polar fraction; compare
widths of 1st and 2nd bands, and note apparent
presence of an unperforate 3rd band.
47. Hantzschia virgata var. intermedia x 2,100
(Llandudno material)
1st band; note difference between distal (left)
and proximal (right) halves.
48. Hantzschia virgata var. intermedia x 3,400
(Llandudno material)
1st band - pole; note how pars exterior narrows.
49. Hantzschia virgata var. intermedia x 3,000
(Llandudno material)
2nd band - distal (left) and proximal (right)
halves.
50. Hantzschia virgata var. intermedia x 3,000
(Llandudno material)
2nd band - open end.
51. Hantzschia virgata var. intermedia x 3,000
(Llandudno material)
2nd band - closed end; note ligula.
52. Hantzschia virgata var. intermedia x 3,000
(Llandudno material)
2nd band - closed end; note ligula.

53. Hantzschia virgata var. gracilis x 2,100
(Cornish material)
Valve, valve view - most; note wider separation of median fibulae.
54. Hantzschia virgata var. gracilis x 2,100
(Borth material)
Valve, valve view - most.
55. Hantzschia virgata var. gracilis x 3,400
(Cornish material)
Centre of valve, valve view; note 'central nodule'.
56. Hantzschia virgata var. gracilis x 3,400
(Borth material)
Frustule, girdle view - half; note ± non-biarcuate disposition of raphe.
57. Hantzschia virgata var. gracilis x 3,400
(Cornish material)
Theca, girdle view - poles and centre; note ligula on band 2 (top), open ends of bands 1 (top) and 2 (bottom): also, note differentiation of the fibula nearest each pole, the presence of a ridge joining the proximal fibula bases, and the central raphe endings.
58. Hantzschia virgata var. gracilis x 3,400
(Aberdeen material)
Cingulum - fraction, showing 3 bands (1st to left).
59. Hantzschia virgata var. gracilis x 3,400
(Aberdeen material)
First 2 bands - fraction; note projections on pars interior of 1st band (arrows).
60. Hantzschia virgata var. gracilis x 4,350
(Cornish material)
Valve, girdle view - centre; note form of fibulae, central raphe endings, and longitudinal ridge (lr) running between proximal fibula bases.

61. Hantzschia virgata var. virgata approx. x 2,000
(Sandbay material)
Frustule, girdle view; note that fibulae 'reach to the edge' even at the centre.
62. Hantzschia virgata var. virgata x 2,100
(Sandbay material)
Valve, valve view.
63. Hantzschia virgata var. virgata x 2,100
(Roper material)
Valve, valve view - half.
64. Hantzschia virgata var. virgata x 4,350
(Sandbay material)
Valve, valve view - fraction; note widening of those costae bearing fibulae, near the fibula bases. Also, note the frequent doubling of the striae within the interspaces (arrow).

65. Hantzschia virgata var. virgata x 3,400
(Roper material)
Valve, girdle view: proximal aspect - centre
(above) and part (below); note central raphe
endings, longitudinal ridge joining the proximal
fibula bases (lr).
66. Hantzschia virgata var. virgata x 3,000
(Sandbay material)
Frustule, girdle view - centre.
67. Hantzschia virgata var. virgata x 3,400
(Roper material)
1st band - end; note fringe on pars interior.
68. Hantzschia virgata var. virgata x 3,400
(Roper material)
2nd band - part; note fringe on pars interior.
69. Hantzschia virgata var. virgata x 2,100
(Sandbay material)
Valve, valve view - pole; note ridge running
between distal fibula bases.
70. Hantzschia virgata var. x 3,400
Valve, valve view.

71. Hantzschia virgata var. leptocephala x 2,100
Valve, valve view.
72. Hantzschia virgata var. leptocephala x 2,950
Valve, valve view; note central disruption of striae.
73. Hantzschia virgata var. leptocephala x 2,950
Frustule, girdle view.
74. Hantzschia virgata var. leptocephala x 2,950
Valve + 1st band - fraction.
75. Hantzschia virgata var. leptocephala x 2,950
Valve, girdle view - pole; note close spacing of fibulae at pole, longitudinal ridge (lr) running at proximal bases of fibulae, submarginal thickening at pole as well as helictoglossa.
76. Hantzschia virgata var. leptocephala x 2,950
Valve, valve view - pole; note Voigt discontinuity (arrow).
77. Hantzschia virgata var. leptocephala x 2,950
Valve, valve view - pole; note widening of those costae bearing fibulae, near the fibula bases.
78. Hantzschia virgata var. leptocephala x 2,950
Valve, valve view - part.
79. Hantzschia virgata var. leptocephala x 2,950
Valve, girdle view; again, note longitudinal ridge.

80. Hantzschia amphioxys: Sea Mills 2 population
x 3,400
Valve, valve view; note obviousness of poroids, and
Voigt discontinuity (arrow).
81. Hantzschia amphioxys: Sea Mills 2 population
x 3,400
Valve, valve view; again note Voigt discontinuity.
82. Hantzschia amphioxys: Sea Mills 2 population
x 4,350
Valve, girdle view - centre; note central interspace, central raphe endings, indented margin of valve.
83. Hantzschia amphioxys: Sea Mills 2 population
x 3,400
Theca, girdle view - part; first 4 bands visible.
84. Hantzschia amphioxys: Bigsweir population
x 3,400
Frustule, girdle view; hypo- (above) and epitheca (below).
85. Hantzschia amphioxys: Bigsweir population
x 6,100
Valve + 1st band, girdle view; note junction of valve margin with the pars exterior of the 1st band.

86. Hantzschia amphioxys: Cotham 1 population
x 3,400
Valve, valve view; note discontinuities.
87. Hantzschia amphioxys: Cotham 1 population
x 3,400
Valve, valve view; note Voigt discontinuity.
88. Hantzschia amphioxys: Cotham 1 population
x 3,400
Valve, valve view; strongly bent form.
89. Hantzschia amphioxys: Cotham 1 population
x 3,400
Valve, valve view; inverse form, note discontinuities.
90. Hantzschia amphioxys: Cotham 1 population
x 3,400
Valve, valve view.
91. Hantzschia amphioxys: Cotham 3 population
x 3,400
Valve, valve view - half; note Voigt discontinuity.
92. Hantzschia amphioxys: Cotham 3 population
x 3,400
Valve, valve view.
93. Hantzschia amphioxys: Cotham 3 population
x 3,400
Valve, valve view.
94. Hantzschia amphioxys: Cotham 2 population
x 3,400
Valve, valve view.

In all, note the differentiation of the central interspace, and the variable size of the fibula.

95. Hantzschia amphioxys: Sea Mills 1 population
x 3,400
Valve, valve view; compare with F.80-81.
96. Hantzschia amphioxys: Sea Mills 1 population
x 6,100
Valve, valve view - part; note poroids in the
subraphe canal wall (arrow).
97. Hantzschia amphioxys: Mauville material x 3,400
Valve, valve view; note central discontinuity.
98. Hantzschia amphioxys: Signy population x 3,400
Valve, valve view; note Voigt discontinuities.
Compare this valve with those illustrated in
F.91-93.
99. Hantzschia amphioxys: Cotham 1 population
x 4,350
Centre of valve, girdle view - detail; note central
interspace and central raphe endings.
100. Hantzschia amphioxys: Cotham 1 population
x 3,400
Valve, girdle view - pole; note helictoglossa (h).

101. Hantzschia virgata var. virgata (no scale)
Cell, girdle view - upper, middle and lower foci;
note prominent pyrenoid (p), lobing of the chromatophore, nucleus with single nucleolus.
102. Hantzschia amphioxys (no scale)
Half-cell, girdle view; note invagination of chromatophore towards the pyrenoid.
103. Hantzschia amphioxys x 1,770
Cell, girdle view - distal/mid (left) and proximal (right) foci; note sizes of plates on proximal and distal sides.
104. Hantzschia amphioxys (no scale)
Cell, valve view; note nucleus in central bridge of cytoplasm, 'H'-shaped chromatophores, and pyrenoids (p).
105. Hantzschia amphioxys x 3,400
Nucleus, valve view - stained with acetocarmine; note granularity of nucleoplasm, single nucleolus.
106. Hantzschia amphioxys x 3,400
Nucleus, girdle view - stained with acetocarmine; note nucleolus.
107. Hantzschia amphioxys x 3,400
Nucleus, girdle view - stained with acetocarmine.

108. Hantzschia sp.A: Sandbay material x 3,400
Valve, valve view; note form and spacing of the fibulae. The helictoglossae are visible. Note also the wider separation of the median fibulae.
109. Hantzschia sp.A: Sandbay material x 3,400
Valve, valve view; in this, and in the other diatoms illustrated on this sheet, note the 'central nodule'.
110. Hantzschia distinctepunctata: Voifluss material x 3,400
Valve, valve view; note size of poroids, extent of fibulae.
111. Hantzschia distinctepunctata: Voifluss material x 3,400
Valve, valve view; note size of poroids.
112. Hantzschia distinctepunctata: Voifluss material x 3,400
Valve, valve view - part; note size of poroids, prominence of transapical costae.

113. Hantzschia sp.A: Sandbay material x 3,400
Valve, girdle view; note biarcuate disposition of the raphe system, the double thickening of the valve at the pole, and the extent of the fibulae.
114. Hantzschia sp.A: Borth material x 3,400
Valve, girdle view.
115. Hantzschia distinctepunctata: Voifluss material x 3,400
Valve, girdle view.
116. Hantzschia sp.A: Sandbay material x 3,400
Valve + 1st band, girdle view - distal aspect (contrast F.113); note distribution of poroids on 1st band.
117. Hantzschia distinctepunctata: Voifluss material x 4,350
Valve pole, girdle view; note helictoglossa (h) and submarginal thickening.
118. Hantzschia sp.A: Sandbay material x 3,400
Part of theca, girdle view - proximal aspect; note presence of 2 rows of poroids on each of the first two bands.
119. Hantzschia sp.A: Sandbay material x 4,350
Centre of valve, girdle view - distal (left) and proximal (right) aspects; note how the costae project above the frets. Also, note the longitudinal ridges joining the fibula bases, and the central raphe endings.
120. Hantzschia distinctepunctata: Voifluss material x 4,350
Centre of valve, girdle view; compare with F.119.
121. Hantzschia distinctepunctata: Voifluss material x 4,350
Frustule, girdle view - distal aspect.

122. Hantzschia segmentalis x 2,100
Valve, valve view; note extent of fibulae,
absence of 'central nodule', irregularity of
poroid spacing near distal margin.
123. Hantzschia segmentalis x 2,100
Valve, girdle view.
124. Hantzschia segmentalis x 3,400
Valve pole - oblique view; note that fibulae are
extended across the valve both proximally and
distally.
125. Hantzschia segmentalis x 3,400
Valve, girdle view - part: distal (left) and
proximal (right) aspects; contrast the distribu-
tions of the poroids.
126. Hantzschia segmentalis x 3,400
Theca, girdle view - pole; note helictoglossa
(arrow).
127. Hantzschia segmentalis x 3,400
Valve, valve view - part; note extension of
fibula across valve face, regularity of poroid
spacing within interspaces.
128. Hantzschia segmentalis x 3,400
Theca, girdle view - part; note that each band
bears several transverse rows of poroids.

129. Hantzschia vivax x 1,120
Valve, valve view.
130. Hantzschia vivax x 3,400
Valve, valve view - part; note relationship of fibulae to costae.
131. Hantzschia vivax x 2,100
Valve, valve view - pole; the helictoglossa is visible.
132. Hantzschia vivax x 2,100
Band; note its open nature, and the 2 transverse rows of poroids.
133. Hantzschia weyprechtii x 3,000
Frustule, girdle view; note that the raphe system is not biarcuate. Also, note the differentiation of the central interspace.
134. Hantzschia weyprechtii x 3,000
Valve, valve view.
135. Hantzschia weyprechtii x 3,400
Nucleus, girdle view - stained with acetocarmine; note granularity of the nucleoplasm.
136. Hantzschia weyprechtii (no scale)
Cell, valve view; note the central nucleus, ± 'H'-shaped chromatophores, each containing a prominent pyrenoid (p) - compare F.101-4 - , and large vacuoles (v).
137. Hantzschia weyprechtii (no scale)
Cell, girdle view; note extent of chromatophores (heavy stipple) and positions of pyrenoids (lighter stipple).