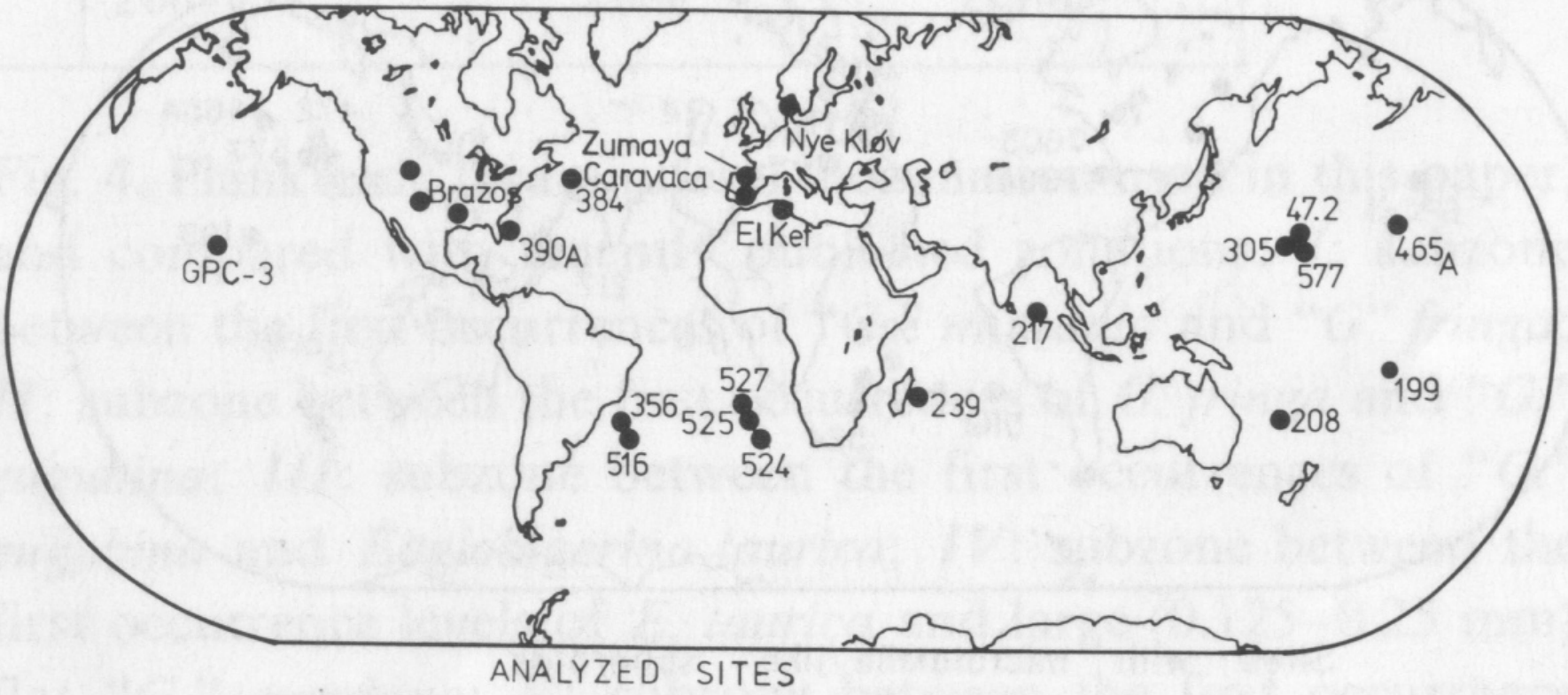

Fig. 1. Map showing the DSDP sites and landbased sections analysed in this paper.

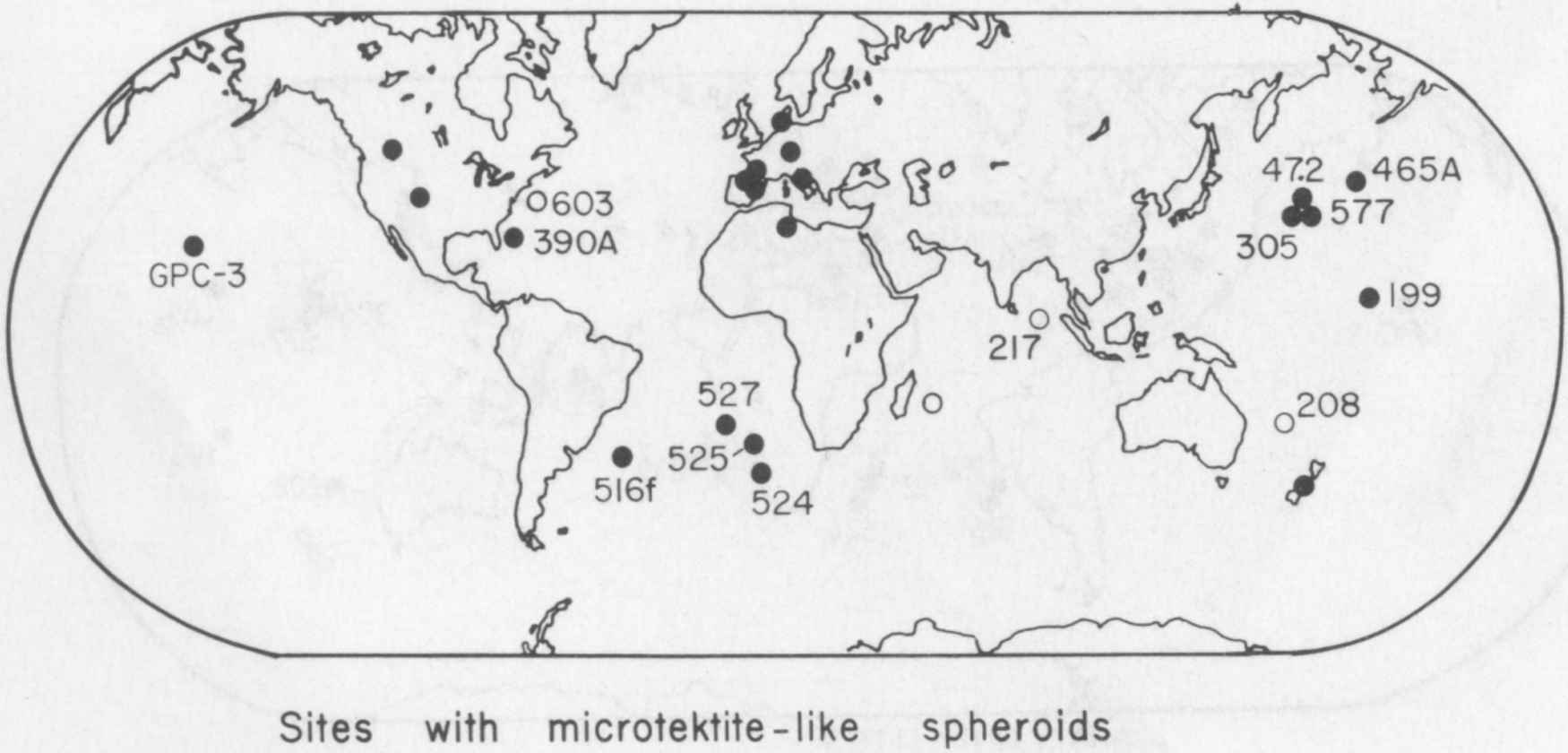

Fig. 2. Map showing worldwide distribution of microtektite-like spherules. Open circles questionable.

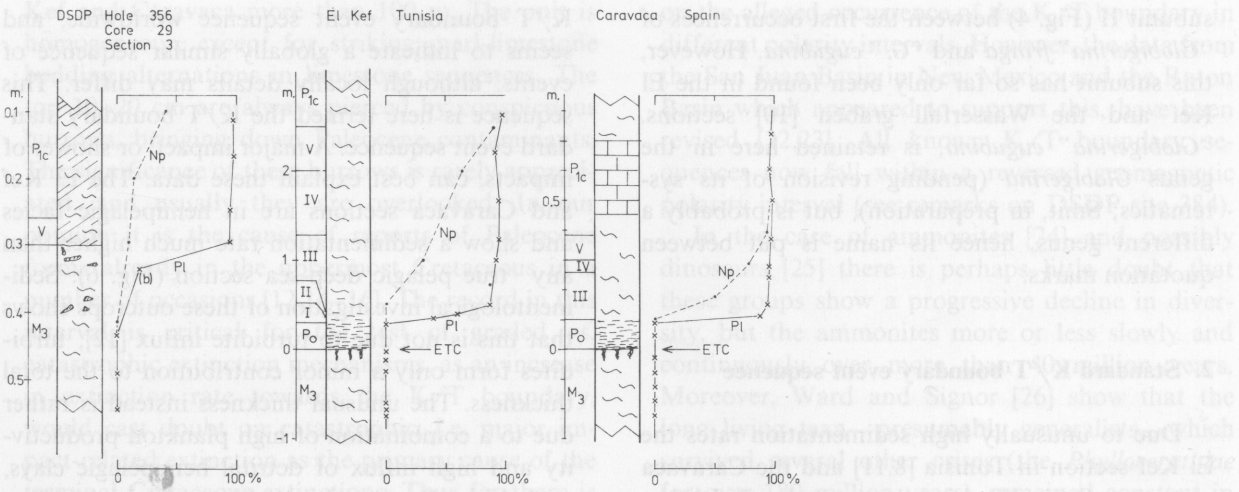

Fig. 3. Abundance ratios of Tertiary (in %) to Cretaceous species from nannoplankton (*Np*) and planktonic foraminiferal species (*Pl*). Nannoplankton abundances of DSDP site 365 after Thierstein [3], El Kef after Perch Nielsen et al. [11] and Caravaca after Romein [17]. Depth in meters of core section in DSDP 356, and in meters from the K/T boundary in the Kef and Caravaca sections. Arrow indicates ETC-rich layer. Zonation in Fig. 4. (*b*) = burrows.

<table>
<tr><th></th><th colspan="4">This Paper</th><th>Boersma and Premoli Silva [12]</th><th>Herm et al. (1981) [13]</th></tr>
<tr><td>$P1_c$</td><td colspan="4">Globigerina pseudobulloides Zone</td><td>Globigerina pseudobulloides Zone</td><td>Globorotalia Compressa Zone
Globigerina edita Zone</td></tr>
<tr><td>$P1_b$</td><td rowspan="4">'Globigerina' eugubina Zone</td><td rowspan="3">Eog. taurica Zone</td><td>V</td><td rowspan="2">IV</td><td rowspan="2">Planorotalites eugubinus Zone (late)</td><td rowspan="3">Globigerina eugubina Zone</td></tr>
<tr><td rowspan="2">$P1_a$</td><td rowspan="2">III</td></tr>
<tr><td>P. eugubinus Zone (early)</td></tr>
<tr><td>II</td><td></td><td>'G' fringa Zone</td></tr>
<tr><td>P_0</td><td colspan="3">Guembelitria cretacea Zone</td><td>I</td><td></td><td></td></tr>
<tr><td>M_3</td><td colspan="4">Abathomphalus mayaroensis Zone</td><td>A. mayaroensis Zone</td><td>A.mayaroensis Zone</td></tr>
</table>

Fig. 4. Planktonic foraminiferal biozonation used in this paper, and compared with recently published zonations. *I*: subzone between the first occurrences of *"G." minutula* and *"G" fringa*; *II*: subzone between the first occurrences of *G. fringa* and *"G." eugubina*; *III*: subzone between the first occurrences of *"G." eugubina* and *Eoglobigerina taurica*; *IV*: subzone between the first occurrence levels of *E. taurica* and large (0.125–0.25 mm) flat *"G." eugubina*; *V*: subzone between the first occurrence levels of large *"G." eugubina* and *G. pseudobulloides*. M_3 to $P1_b$ after Smit [8].

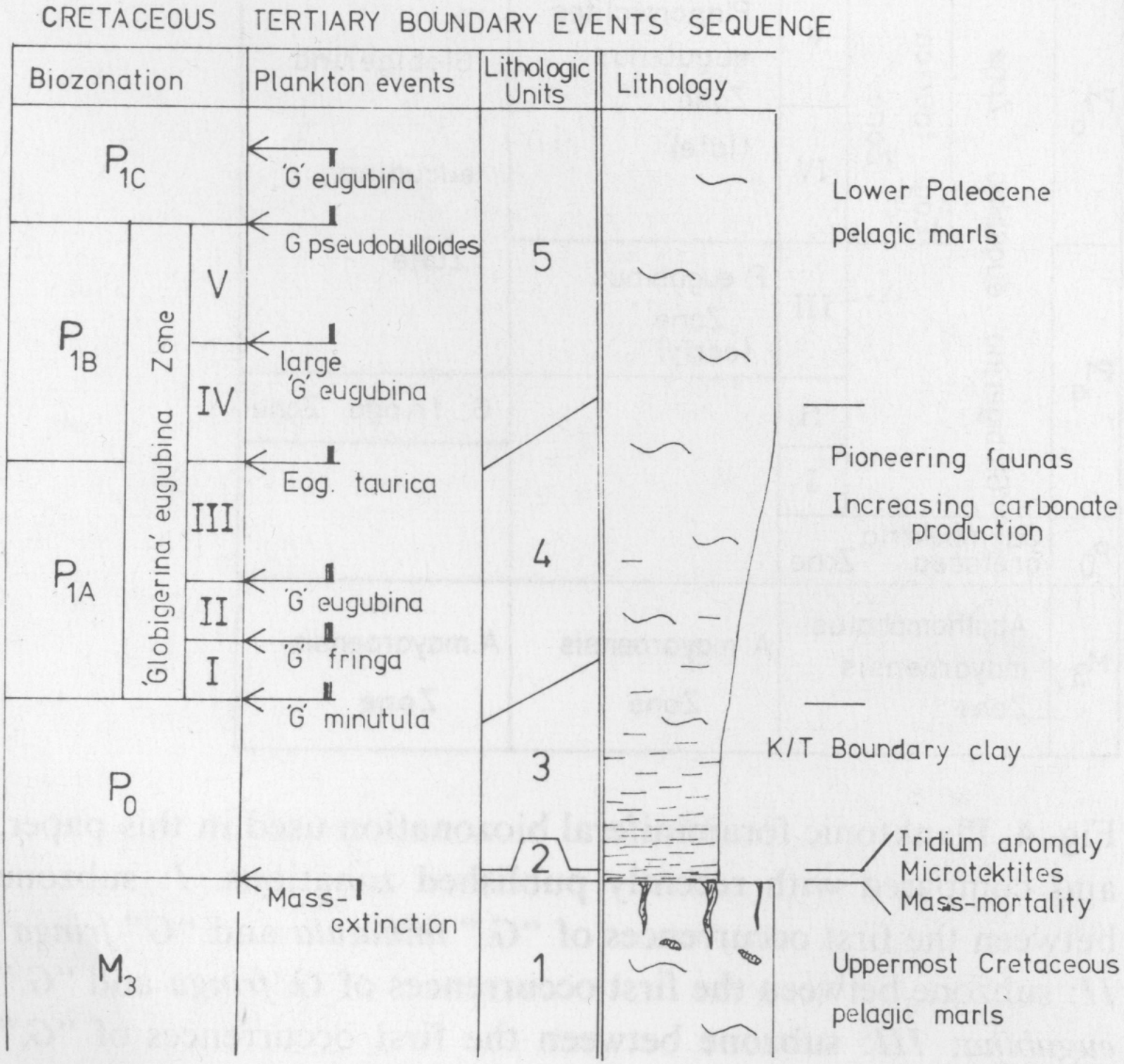

Fig. 5. Standard Cretaceous-Tertiary boundary events sequence as discussed in the text. Vertical scale is not measured, but the relative thickness is averaged from the most typical sections. *1 – 5* lithological units. See also Fig. 8.

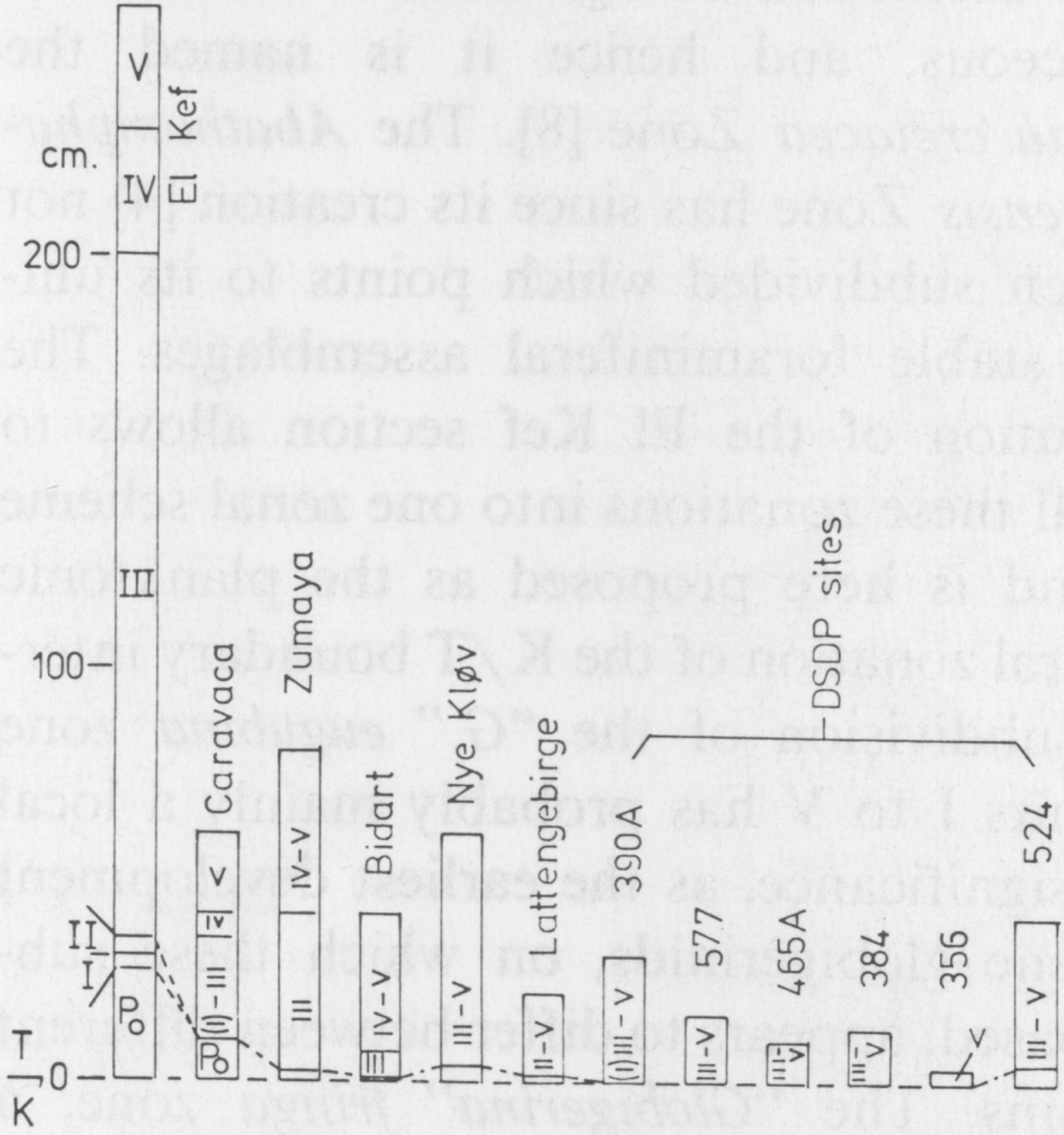

Fig. 6. Comparison of thickness of the *G. cretacea* and "*G.*" *eugubina* Zones of the sections analysed.

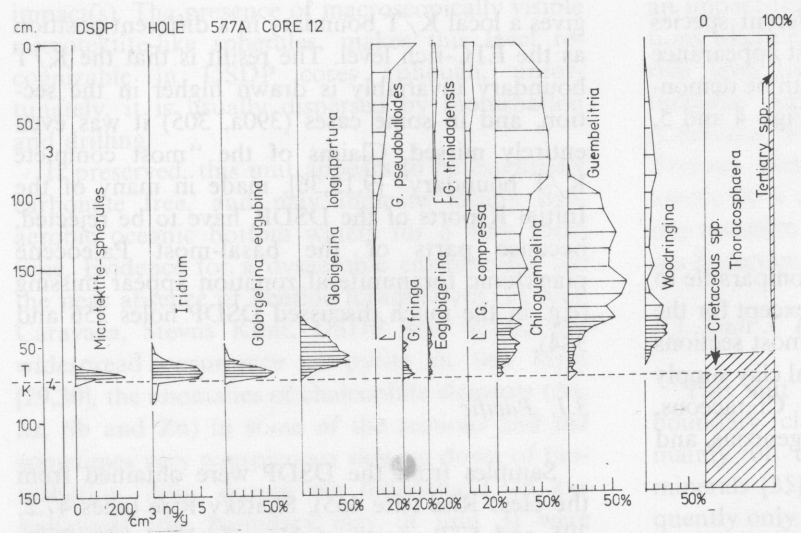

Fig. 7. Abundance profiles of microtektite-like spherules, iridium (from DSDP hole 577B after Asaro et al. [39]), and relative abundances of planktonic foraminifera and nannoplankton of DSDP hole 577A-12 sections 3/4. Depth in centimeters in core section. - - - - - = K/T boundary level.

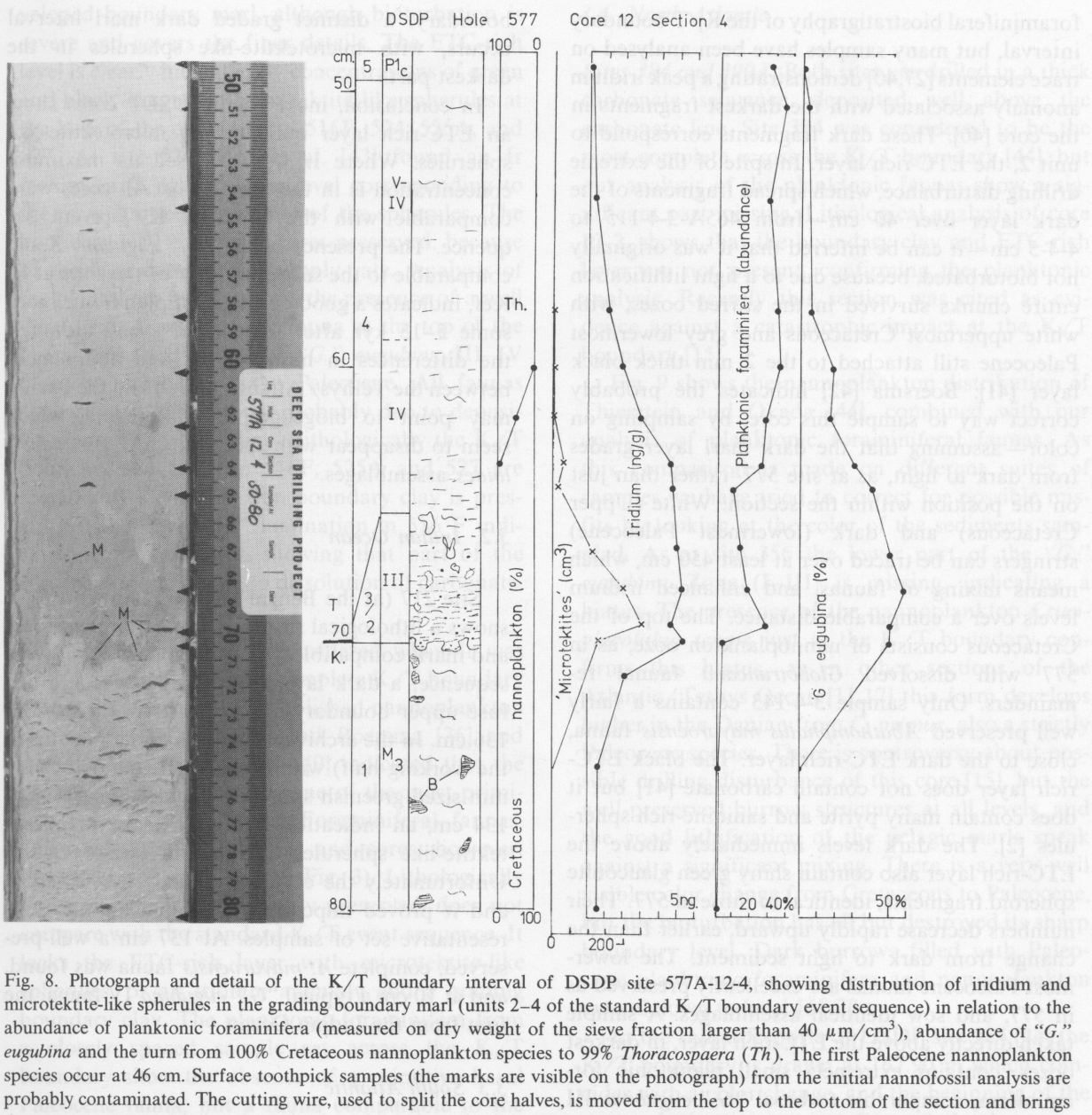

Fig. 8. Photograph and detail of the K/T boundary interval of DSDP site 577A-12-4, showing distribution of iridium and microtektite-like spherules in the grading boundary marl (units 2–4 of the standard K/T boundary event sequence) in relation to the abundance of planktonic foraminifera (measured on dry weight of the sieve fraction larger than 40 $\mu m/cm^3$), abundance of *"G." eugubina* and the turn from 100% Cretaceous nannoplankton species to 99% *Thoracospaera* (*Th*). The first Paleocene nannoplankton species occur at 46 cm. Surface toothpick samples (the marks are visible on the photograph) from the initial nannofossil analysis are probably contaminated. The cutting wire, used to split the core halves, is moved from the top to the bottom of the section and brings down younger nannofossils to lower levels at the surface. *B* = burrows with Paleocene and boundary marl material; *M* = microtektite-like spherules.

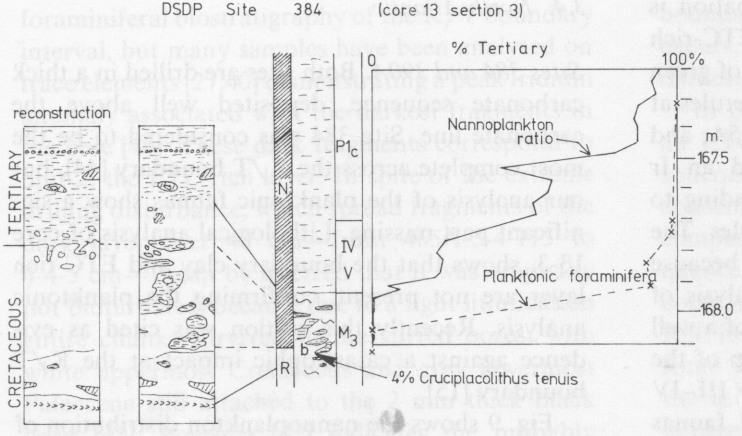

Fig. 9. Magnetozonation, lithology, zonation and ratio of abundance of nannoplankton [44] and planktonic foraminifera of site 384, core 13, section 3 (North Atlantic) across the Cretaceous-Tertiary boundary. N = normal and R = reversed magnetic polarity interval. *b* = darker burrows with Paleocene material, extending below the K/T boundary. Zonation in Fig. 4. At left the reconstruction of the Initial Reports of the DSDP [44]. Note burrows extending beyond the R-N magnetic reversal. Depth in meters subbottom.

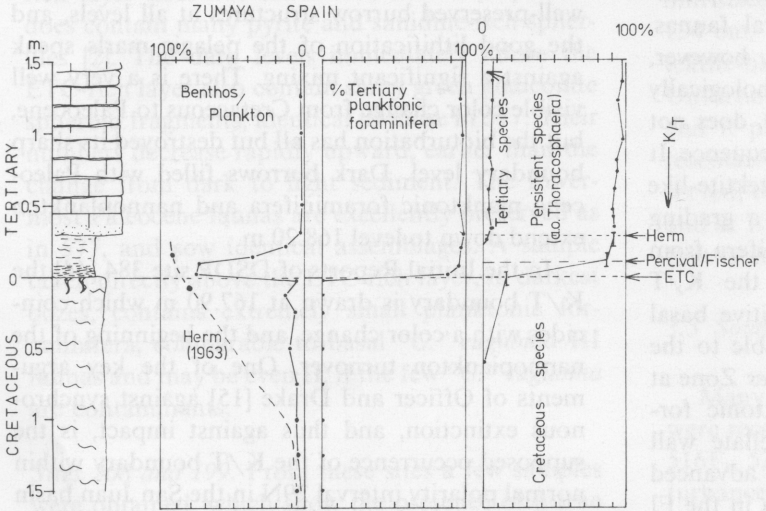

Fig. 10. Zumaya section, showing from left to right; the ratio of benthic to planktonic foraminifera after Herm [20] and as analysed in this paper; the ratio of Cretaceous to Paleocene planktonic foraminifera (this paper); and the ratio of Cretaceous to Paleocene to "disaster species" [30] like *Thoracosphaera* and *Braarudosphaera* (see also Figs. 8, 9). *K/T* = earlier determined K/T boundary levels [20, 30] and the extraterrestrial component (ETC) -rich layer (= K/T boundary in this paper).

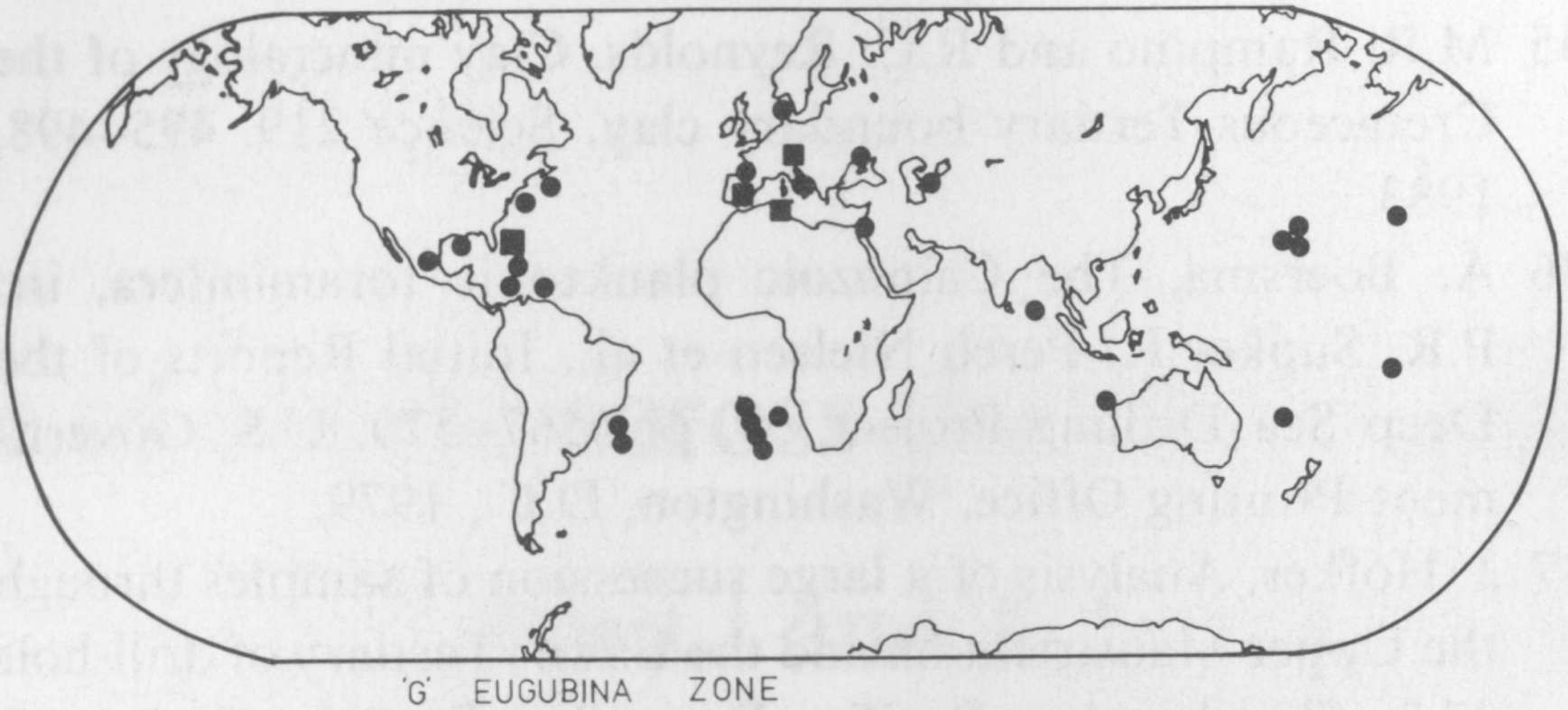

Fig. 11. Map showing the worldwide distribution of assemblages of the "*G.*" *eugubina* Zone. Squares indicate sites where assemblages of subzones I and/or II were found.