PLATES

PLATE 1

Fig. 1. Portilla Formation member A northwest of Sagüera (Bernesga area): slump structures, looking parallel to the slump axis (view looking west).

Fig. 2. Portilla Formation south of Mirantes de Luna (Bernesga area): "large-scale crossbedding" in member C (view looking southeast).

Fig. 3. Portilla Formation member C northeast of Barrios de Luna (Bernesga area): broken branching and platy tabulate corals in red mud (*Thamnopora*-bed, back-reef).

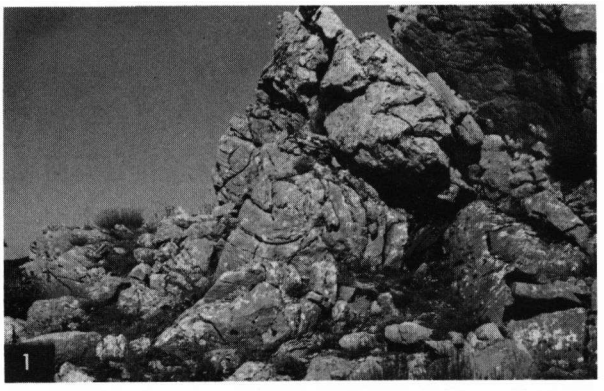
Fig. 4. Candás Formation member A, Cigüedres (Asturias): silicified branching rugose corals in life position in grey mud (fore-reef).

Fig. 5. Candás Formation member C, Luanco (Asturias): massive stromatoporoids, solitary and branching rugose corals in life position in grey mud (fore-reef; looking at the lower surface of a bed).

Fig. 6. Candás Formation member C, Luanco (Asturias): marl-siltstone alternation with scarce fauna (below wave-base).

Fig. 7. Santa Lucía Formation and Nocedo Formation east of Portilla de Luna (Bernesga area): the thickness of the Santa Lucía (SL) is variable, shales of the Nocedo Formation (N, almost completely overgrown) filling the depressions (view looking east, stratigraphic top at the left side).

Fig. 8. Nocedo Formation member A near Barrios de Gordón (Bernesga area): above the limestone of the Portilla Formation (P) there is a coarsening upward sequence from shales via siltstones to sandstones which form the top of the hill which slopes down at the other side where the shales of member B are present (view looking north; stratigraphic top at the right side; the arrow indicates the boundary between Portilla and Nocedo).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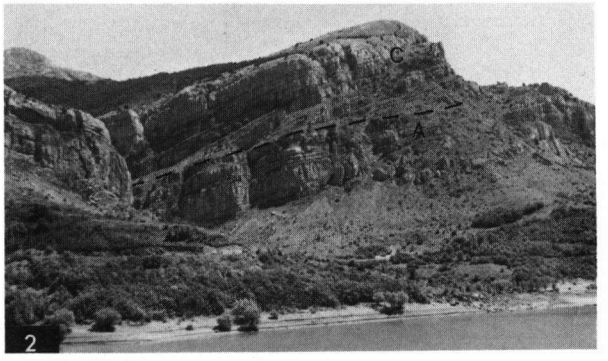

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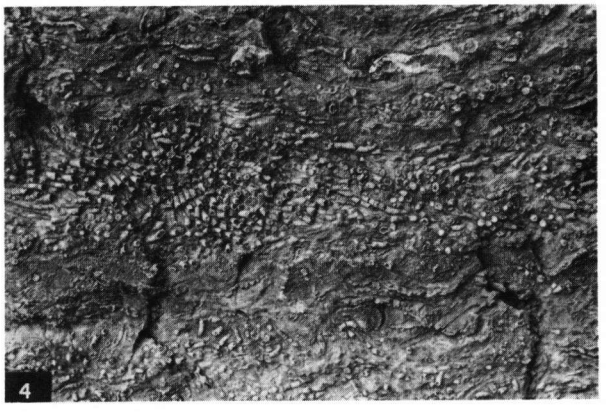
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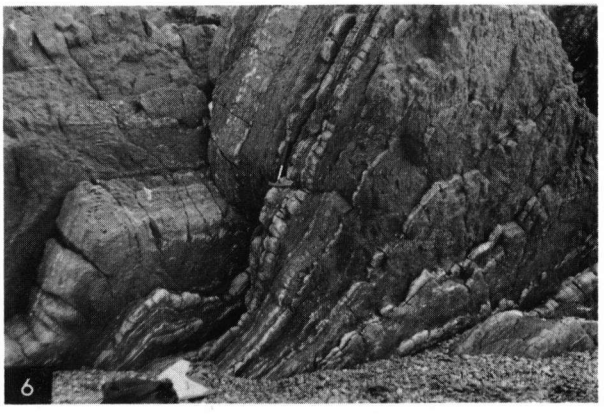
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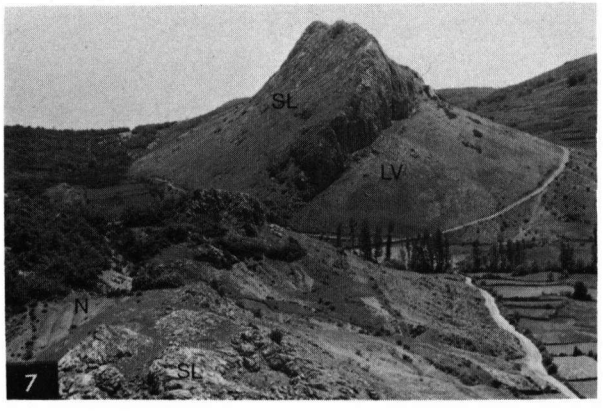

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PLATE 2

Fig. 1. Nocedo Formation member A at Playa de Gargantera (Asturias): large-scale current cross-bedding and sand bars (stratigraphic top at the left side).

Fig. 2. Contact between the Ordovician Barrios Formation and the late Famennian Ermita Formation near La Uña (Isidro area). Although the hiatus is large the contact surface is only slightly undulating (the arrows indicate the erosional surface).

Fig. 3. The Upper Devonian near the Puerto de la Cubilla (Caldas area): the Ermite Formation (E) lies on top of the Santa Lucía Formation (SL) filling two karst holes (indicated by the arrows at the right side) and a large tectonic fissure (indicated by the arrow at the left side) which reaches even into the La Vid Formation (LV), layers of the La Vid being deformed (view looking north, the highest mountain is the Peña Ubiña).

Fig. 4. Ermita Formation at Las Portillas (Picos de Europa area): irregular flint nodules in crinoidal grainstones.

Fig. 5. Vidrieros Formation north of Cardaño de Arriba (Gardaño area, Palencian basin): rhythmic alternation of shales with layers of limestone nodules and limestone beds (the limestone is weathered).

Fig. 6. Nocedo Formation member A at Huergas de Gordón (Bernesga area): large-scale crossbedding in the upper part of member A in the stratotype. The beds show a unimodal current direction towards the southwest (stratigraphic top at the right side).

Fig. 7. Candás Formation member C near Coallajú (Asturias): massive rugose corals (*Hexagonaria, Endophyllum*; reef).


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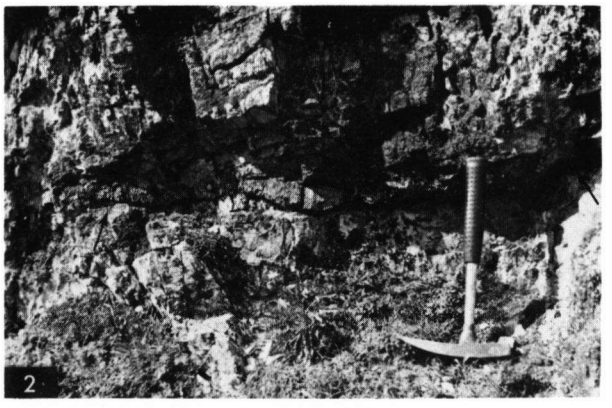
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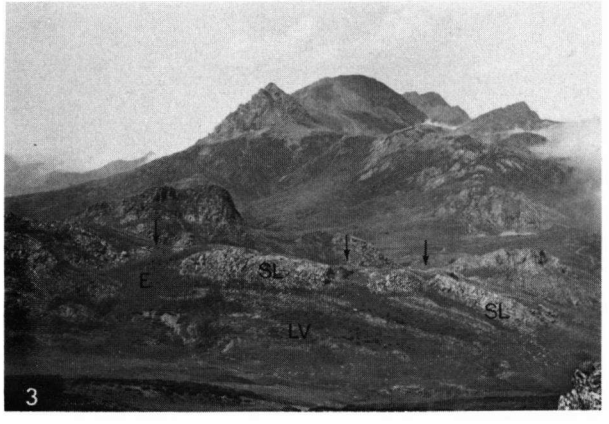

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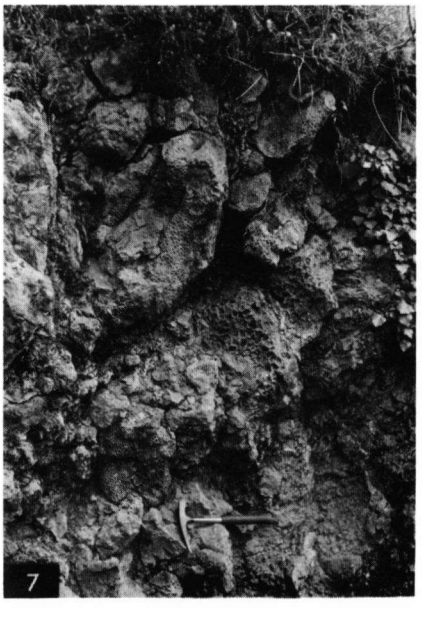
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PLATE 3

Fig. 1, 2. *Polygnathus varcus* Stauffer, 1940; sample P104, Portilla Formation member A, allochthonous lenticle within the Huergas Formation, E of Mirantes de Luna (Bernesga area), Lower to Middle *varcus* Subzone, x 70.

Fig. 3. *Polygnathus timorensis* Klapper, Philip & Jackson, 1970; sample C61, Portilla Formation, allochthonous lenticle within the Huergas Formation, San Adrián (Esla area), *varcus* Zone, x 70.

Fig. 4. *Polygnathus ansatus* Ziegler, Klapper & Johnson, 1976; sample P127, Portilla Formation member A, San Martín-Rebanal (Ventanilla area), Lower to Middle *varcus* Subzone, x 70.

Fig. 5. *Polygnathus xylus ensensis* Ziegler & Johnson, 1976; sample C23, Portilla Formation member A, S of Argovejo (Esla area), Middle *varcus* Subzone, x 55.

Fig. 6a, b. *Polygnathus xylus xylus* Stauffer, 1940; sample N73, Portilla Formation member C, Barrios de Gordón (Bernesga area), Lower *asymmetricus* Zone, x 70.

Fig. 7a, b; 8a, b. *Polygnathus decorosus* Stauffer, 1938; sample P157, Nocedo Formation member A, Olleros de Alba (Bernesga area), Lowermost to Lower *asymmetricus* Zone, Fig. 7a: x 40, Fig. 7b: x 42, Fig. 8a, b: x 35.

Fig. 9a, b. *Polygnathus dubius* Hinde, 1879; sample N17, Nocedo Formation member A, Pico Aguasalio (Esla area), Lower to Middle *asymmetricus* Zone, x 70.

Fig. 10. *Polygnathus* spec.; aberrant specimen, sample P152, Portilla Formation member C, Veneros (Esla area), *hermanni-cristatus* Zone to Lowermost *asymmetricus* Zone, x 70.

Fig. 11. *Polygnathus linguiformis linguiformis* Hinde, 1879; sample P127, Portilla Formation member A, San Martín-Rebanal (Ventanilla area), Lower to Middle *varcus* Subzone, x 70.

Fig. 12. *Polygnathus linguiformis linguiformis* Hinde, 1879; sample P159, Portilla Formation member A, allochthonous lenticle within the Huergas Formation, E of Mirantes de Luna (Bernesga area), Lower to Middle *varcus* Subzone, x 35.

Fig. 13a, b. *Polygnathus linguiformis mucronatus* Wittekindt, 1966; sample P98, Portilla Formation member A, NW of Quejo (Somiedo area), Middle *varcus* Subzone, x 70.

Fig. 14a, b; 15. *Polygnathus linguiformis mucronatus* Wittekindt, 1966; sample C73, Portilla Formation member A, La Vega de los Viejos (Somiedo area), Middle *varcus* Subzone, x 70.

Fig. 16. *Polygnathus linguiformis linguiformis* Hinde, 1879; sample C73, Portilla Formation member A, La Vega de los Viejos (Somiedo area), Middle *varcus* Subzone, x 35.

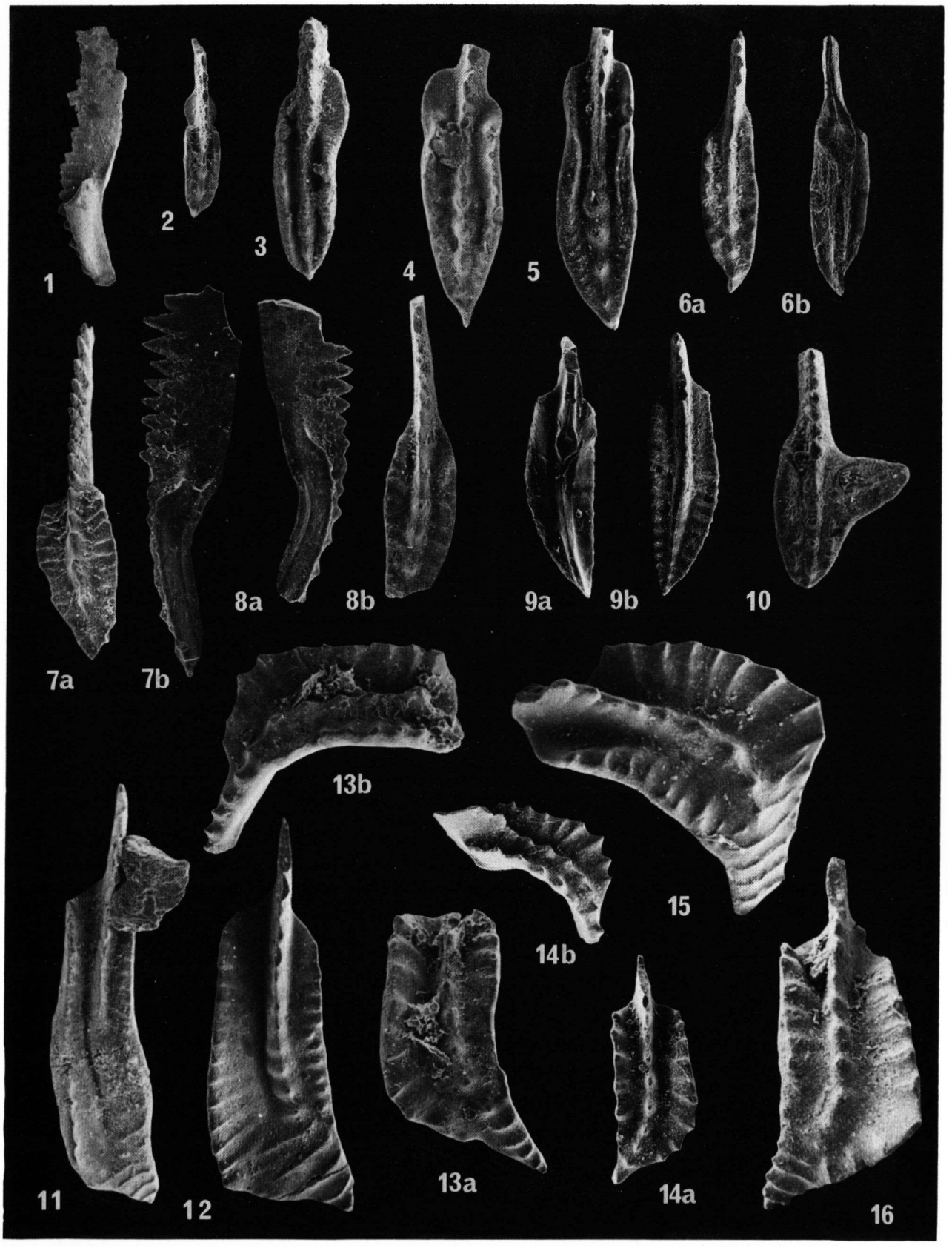
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PLATE 4

Fig. 1, 2. *Icriodus* aff. *subterminis* Youngquist, 1947; sample N99, Nocedo Formation member A, Cigüedres (Somiedo area), *asymmetricus* Zone (?), x 70.

Fig. 3. *Icriodus* aff. *subterminis* Youngquist, 1947; sample N41, Nocedo Formation member A, Huergas de Gordón (Bernesga area), Lower to Middle *asymmetricus* Zone, x 70.

Fig. 4. *Icriodus* aff. *subterminis* Youngquist, 1947; sample N2, Nocedo Formation member A, La Ercina (Esla area), Middle *asymmetricus* Zone, x 70.

Fig. 5. *Icriodus* aff. *subterminis* Youngquist, 1947; sample P119, Portilla Formation member C, N of Cistierna (Esla area), *asymmetricus* Zone (?) x 70.

Fig. 6. *Icriodus obliquimarginatus* Bischoff & Ziegler, 1957; sample C57, Portilla Formation, allochthonous lenticle within the Huergas Formation, San Adrián (Esla area), Lower to Middle *varcus* Subzone, x 70.

Fig. 7. *Icriodus eslaensis* van Adrichem Boogaert, 1967; sample P115, Portilla Formation member A, E of Aleje (Esla area), Middle *varcus* Subzone, x 70.

Fig. 8. *Icriodus symmetricus* Branson & Mehl, 1934; sample P51, Portilla Formation member C, Mallo (Bernesga area), Frasnian, x 70.

Fig. 9, 10, 12. *Icriodus eslaensis* van Adrichem Boogaert, 1967, sample C23, Portilla Formation member A, S of Argovejo (Esla area), Middle *varcus* Subzone, Fig. 9: x 76, Fig. 10, 12: x 70.

Fig. 11, 13. *Icriodus eslaensis* van Adrichem Boogaert, 1967; sample P38, Portilla Formation member A, Saliencia (Somiedo area), Lower to Middle *varcus* Subzone, x 70.

Fig. 14, 16. *Icriodus symmetricus* Branson & Mehl, 1934; sample N46, Nocedo Formation member A, Carrocera de Alba (Bernesga area), Middle *asymmetricus* Zone, x 70.

Fig. 15. *Icriodus symmetricus* Branson & Mehl, 1934; sample P145, Portilla Formation member C, SE of Puerto del Somiedo (Somiedo area), Upper *varcus* Subzone to Lower *hermanni-cristatus* Zone, x 70.

Fig. 17. *Icriodus expansus* Branson & Mehl, 1938; sample P127, Portilla Formation member A, San Martín-Rebanal (Ventanilla area), Lower to Middle *varcus* Subzone, x 70.

Fig. 18. *Polygnathus ovatinodosus* Ziegler & Klapper, 1976; sample P157, Nocedo Formation member A, Olleros de Alba (Bernesga area), Lowermost to Lower *asymmetricus* Zone, x 40.

Fig. 19. *Polygnathus webbi* Stauffer, 1938; sample P157, Nocedo Formation member A, Olleros de Alba (Bernesga area), Lowermost to Lower *asymmetricus* Zone, x 35.

Fig. 20. *Polygnathus webbi* Stauffer, 1938; sample N2, Nocedo Formation member A, La Ercina (Esla area), Middle *asymmetricus* Zone, x 78.

Fig. 21, 22. "Conodont pearls"; sample P106, Portilla Formation member C, allochthonous lenticle within the Huergas Formation, E of Mirantes de Luna (Bernesga area), Frasnian, x 140.

Fig. 23. *Scaliognathus praeanchoralis* Lane, Sannemann & Ziegler, 1980; sample A5, Alba Formation, (Ventanilla area), *anchoralis-latus* Zone, x 140.

Fig. 24. *Palmatolepis gracilis* Branson & Mehl, 1934; aberrant specimen, sample Ca6, Vidrieros Formation, S of Pico Murcia (Car daño area, Palencian basin), *costatus* Zone, x 70.

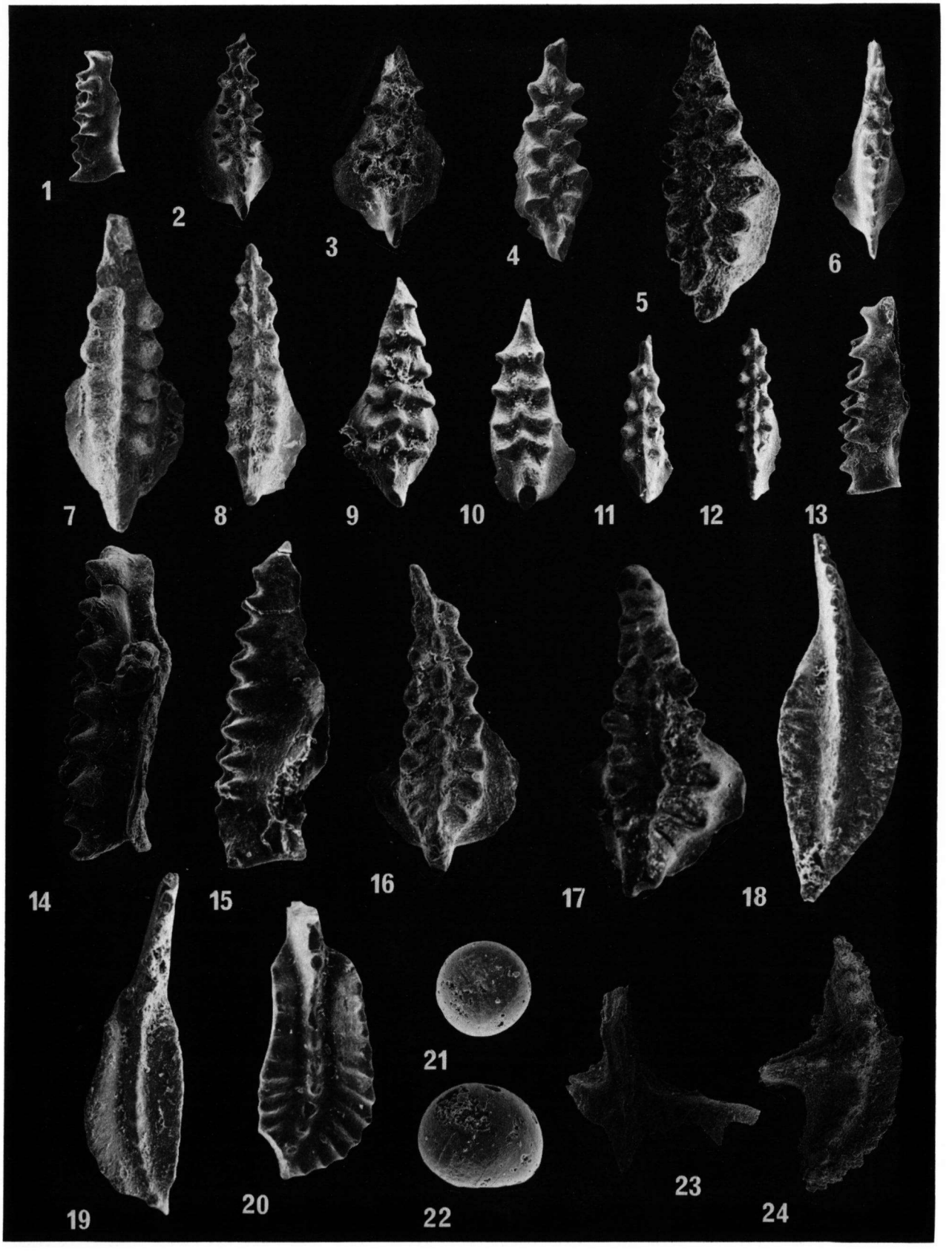
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PLATE 5

Fig. 1. *Polygnathus* cf. "*Polygnathus norrisi*" Uyeno, 1967; aberrant specimen, sample Ca4, Vidrieros Formation, E of Santibañez de Resoba (Cardaño area, Palencian basin), *marginifera* Zone, x 70.

Fig. 2. *Pseudopolygnathus* spec. A; sample Vi13, Vidrieros Formation, olistolith NW of Mogrovejo (Liébana area, Palencian basin), *costatus* Zone, x 70.

Fig. 3a, b. *Pseudopolygnathus* spec. A; sample Vi15, Vidrieros Formation, olistolith N of Tanarrio (Liébana area, Palencian basin), *costatus* Zone to *Protognathodus* fauna, x 70.

Fig. 4. *Pseudopolygnathus primus* Branson & Mehl, 1934; sample E4, Ermita Formation, Pico Aguasalio (Esla area), *pseudosemiglaber* Zone, x 70.

Fig. 5. *Pseudopolygnathus multistriatus* Mehl & Thomas, 1947; sample Er4, Ermita Formation, Nocedo de Bernesga (Bernesga area), *pseudosemiglaber* Zone, x 70.

Fig. 6. *Polygnathus communis communis* Branson & Mehl, 1934; sample E24, Ermita Formation, NW of Robledo de Guzpena (Esla area), *pseudosemiglaber* Zone, x 70.

Fig. 7. *Polygnathus communis communis* Branson & Mehl, 1934; sample E18, Ermita Formation, NE of Mirantes de Luna (Bernesga area), *pseudosemiglaber* Zone, x 70.

Fig. 8. *Polygnathus communis carina* Hass, 1959; sample E24, Ermita Formation, NW of Robledo de Guzpeña (Esla area), *pseudosemiglaber* Zone, x 70.

Fig. 9. *Polygnathus delicatulus* Ulrich & Bassler, 1926; sample E30, Ermita Formation, Robledo de Caldas (Caldas area), *costatus* Zone, x 70.

Fig. 10. *Polygnathus inornatus* E.R. Branson, 1934; sample E4, Ermita Formation, Pico Aguasalio (Esla area), *pseudosemiglaber* Zone, x 35.

Fig. 11a, b. *Polygnathus spicatus* E.R. Branson, 1934; sample Vi13, Vidrieros Formation, olistolith NW of Mogrovejo (Liébana area, Palencian basin), *costatus* Zone, x 70.

Fig. 12a, b. *Polygnathus inornatus* E.R. Branson, 1934; sample Er4, Ermita Formation, Nocedo de Bernesga (Bernesga area), *pseudosemiglaber* Zone, x 35.

Fig. 13a, b. *Polygnathus* spec. A; sample N69, Ermita Formation, Beberino (Bernesga area), *costatus* Zone, x 70.


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PLATE 6

Fig. 1. *Gnathodus cuneiformis* Mehl & Thomas, 1947; sample E24, Ermita Formation, NW of Robledo de Guzpeña (Esla area), *pseudosemiglaber* Zone, x 70.

Fig. 2, 4. *Gnathodus pseudosemiglaber* Thompson & Fellows, 1970; sample NODII, Alba Formation, Nocedo de Bernesga (Bernesga area), *anchoralis-latus* Zone, x 70.

Fig. 3. *Gnathodus cuneiformis→pseudosemiglaber*; sample Er4, Ermita Formation, Nocedo de Bernesga (Bernesga area), *pseudosemiglaber* Zone, x 70.

Fig. 5. *Pseudopolygnathus pinnatus* Voges, 1959; sample NODII, Alba Formation, Nocedo de Bernesga (Bernesga area), *anchoralis-latus* Zone, x 70.

Fig. 6a, b. *Bispathodus stabilis* (Branson & Mehl, 1934); sample NODII, Alba Formation, Nocedo de Bernesga (Bernesga area), *anchoralis-latus* Zone, x 70.

Fig. 7a, b. "*Spathognathodus*" spec. A aff. *bohlenanus* Helms, 1959; sample Vi22, Vidrieros Formation, olistolith near Vandejo (Liébana area, Palencian basin), *costatus* Zone, x 70.

Fig. 8. *Pandorinellina plumulus* (Rhodes, Austin & Druce, 1969); sample N52, Ermita Formation, Caldas de Luna (Caldas area), *costatus* Zone, x 47.

Fig. 9. "*Spathognathodus*" spec.; sample MAR2 (RGM 125326), Alba Formation, San Martín de los Herreros (Ventanilla area), *anchoralis-latus* Zone, x 70.

Fig. 10. "*Spathognathodus*" spec.; sample Vi18, Vidrieros Formation, olistolith near Toranzo (Liébana area, Palencian basin), *costatus* Zone, x 70.

Fig. 11. "*Spathognathodus*" spec.; sample E31, Ermita Formation, Rodillazo (Bernesga area), *Polygnathus* fauna, x 70.

Fig. 12. "*Spathognathodus*" spec.; sample N71, Alba Formation, Sagüera (Bernesga area), *anchoralis-latus* Zone, x 70.

Fig. 13. *Clydagnathus gilwernensis* Rhodes, Austin & Druce, 1969; sample HG42 (RGM 296770), Ermita Formation, S of Caín (Picos de Europa area), *costatus* Zone, x 73.


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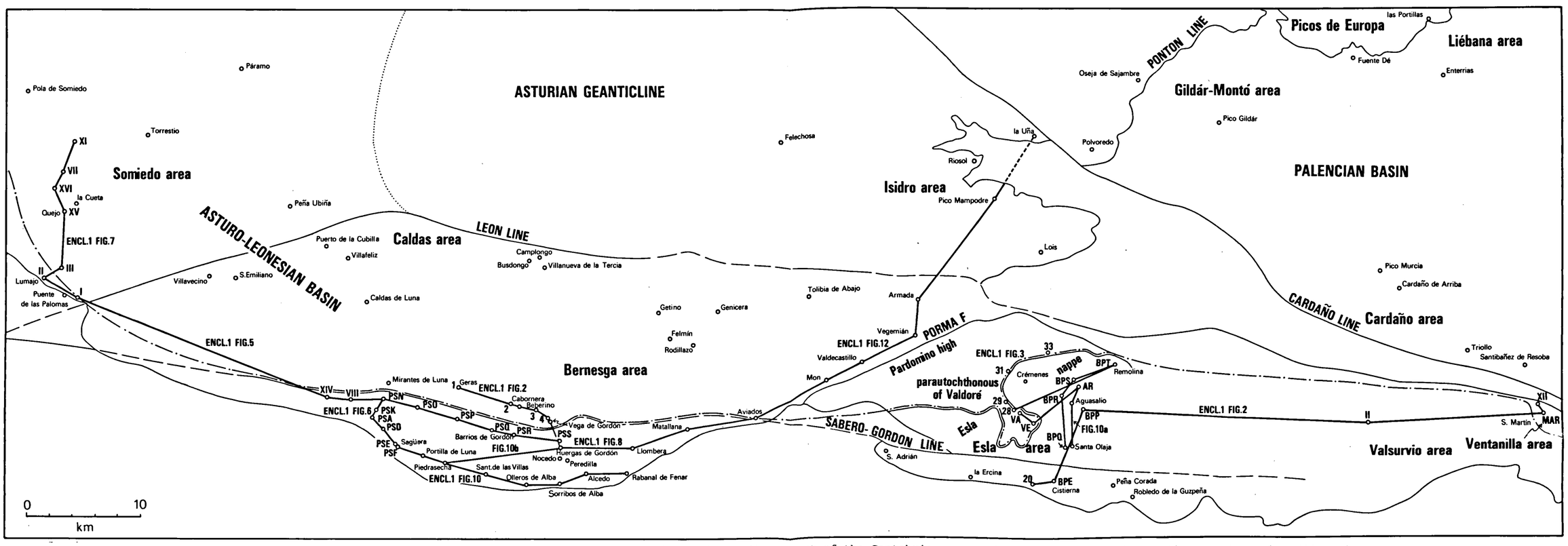


Fig. 1. Index map of the cross-sections and the sections to which reference is made in the text (only the southern part of the Cantabrian zone; the names refer to the sections, not to the villages).

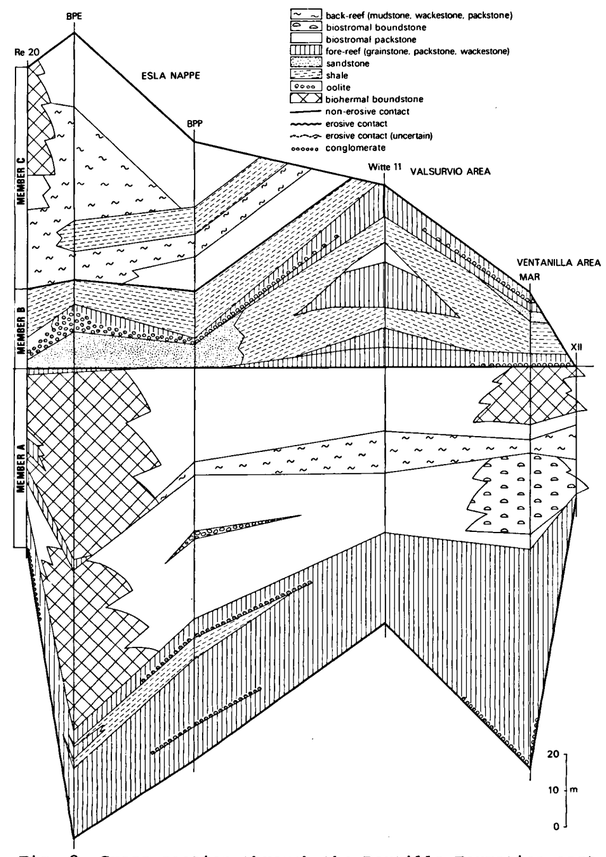


Fig. 2. Cross-section through the Portilla Formation east of the Porma fault (the sections were measured by Reijers (1972), van der Baan (1970), Witte (1980), Wassink (1979) and myself; horizontal not to scale).

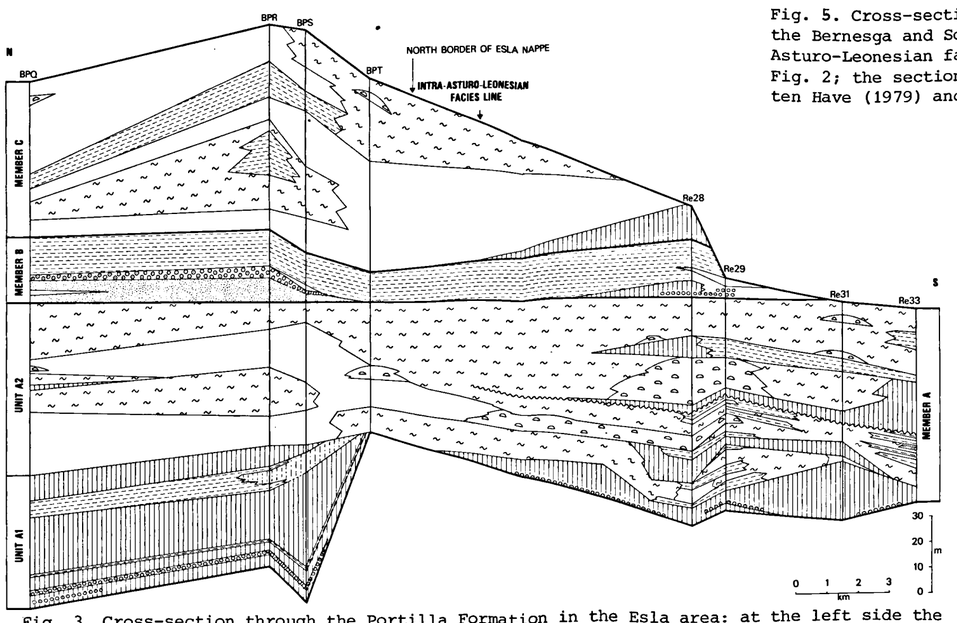
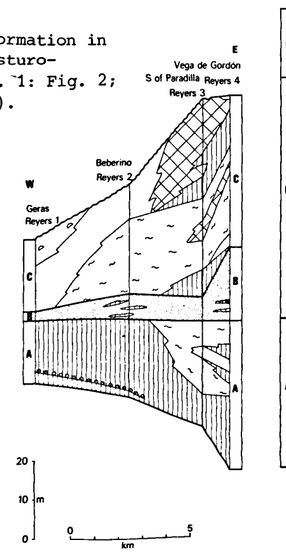


Fig. 3. Cross-section through the Portilla Formation in the Esla area: at the left side the Esla nappe, at the right side the parautochthonous of Valdoré (for a legend see Encl. 1: Fig. 2; the sections were measured by van der Baan (1970) and Reijers (1972)).

Fig. 4. Cross-section through the Portilla Formation in the Bernesga area, just north of the Intra-Asturo-Leonesian facies line (for a legend see Encl. 1: Fig. 2; the sections were measured by Reijers (1972)).



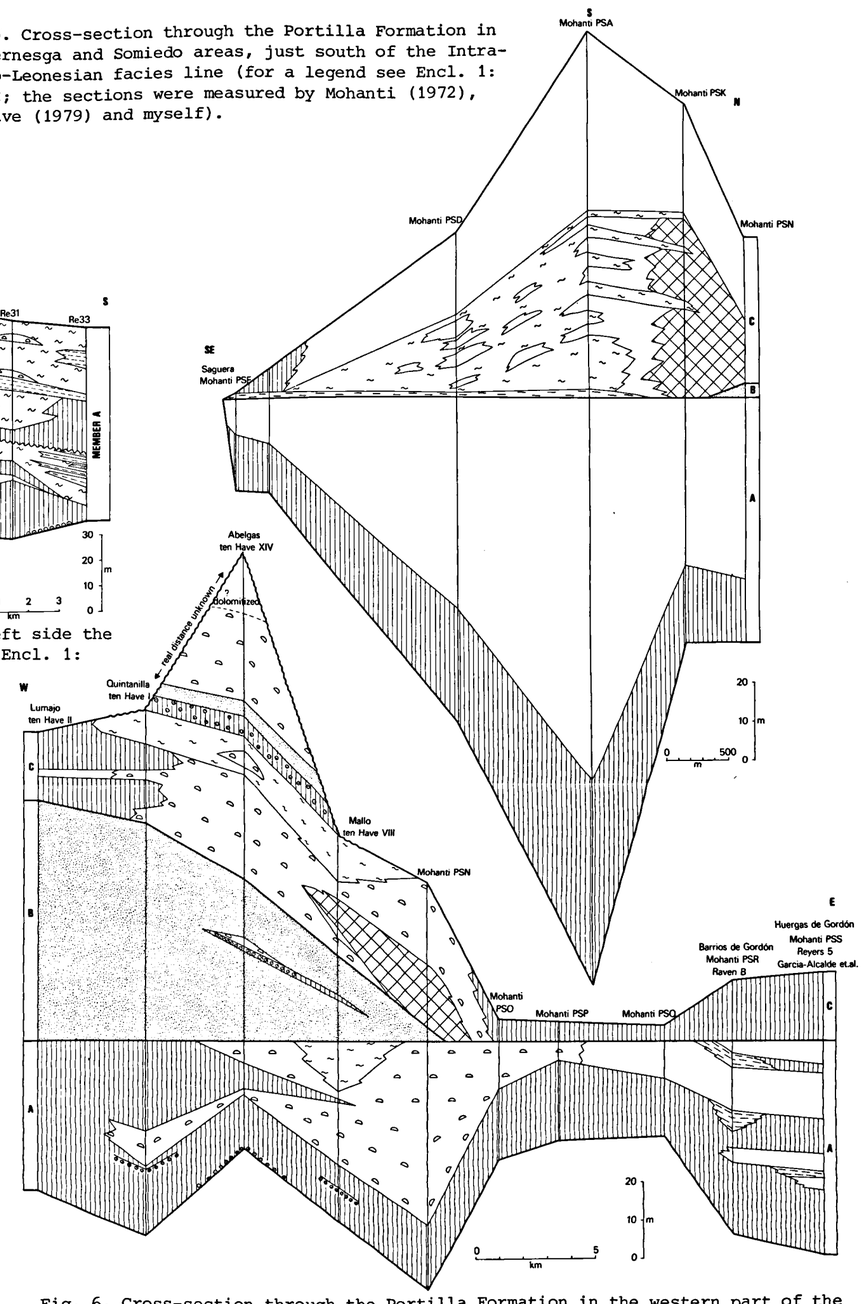


Fig. 5. Cross-section through the Portilla Formation in the Bernesga and Somiedo areas, just south of the Intra-Asturo-Leonesian facies line (for a legend see Encl. 1: Fig. 2; the sections were measured by Mohanti (1972), ten Have (1979) and myself).

Fig. 6. Cross-section through the Portilla Formation in the western part of the Alba syncline (Bernesga area), south of the Intra-Asturo-Leonesian facies line (for a legend see Encl. 1: Fig. 2; in this figure biostromal packstones and boundstones are both indicated by white; the sections were measured by Mohanti (1972), ten Have (1979) and myself).

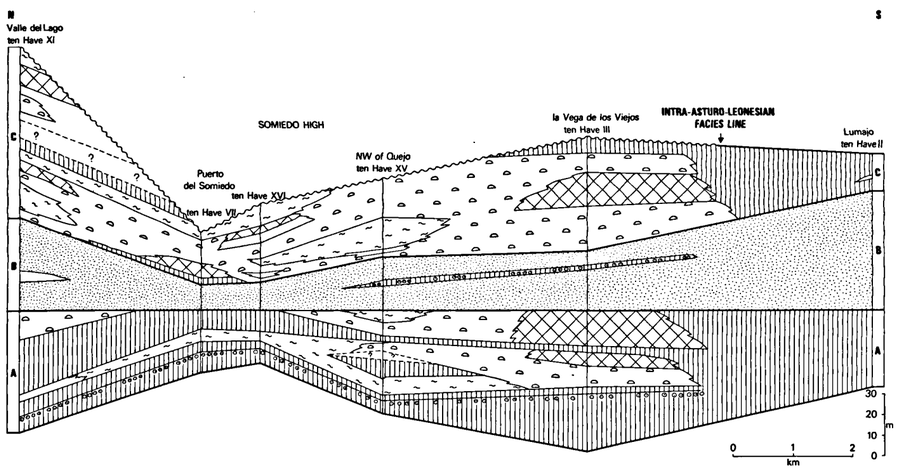


Fig. 7. Cross-section through the Portilla Formation across the Somiedo high, showing the little thickness on the high and the erosion of the top of member C: at section XI and III it reaches into the *asymmetricus* Zone but at XVI only to the Lower - *manni-cristatus* Zone. The sections were measured by ten Have (1979).

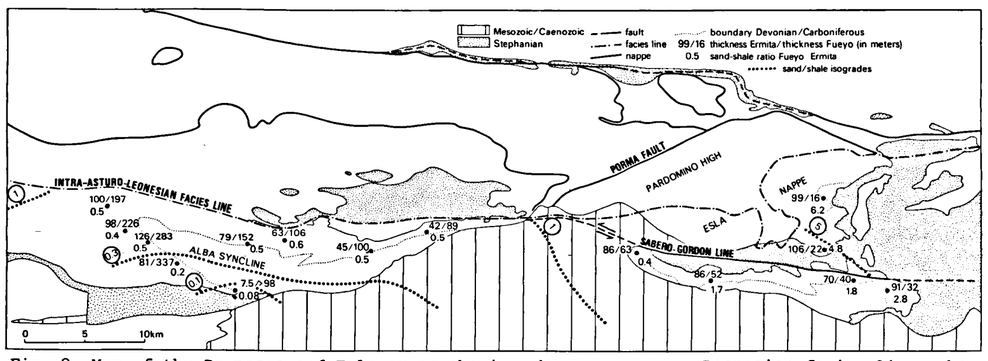


Fig. 9. Map of the Bernesga and Esla areas showing the Intra-Asturo-Leonesian facies line, the Sabero-Gordón line, the León line in the north, the Stephanian basins along the faults and the sand-shale ration of Fueyo and Ermita in the areas south of the Intra-Asturo-Leonesian facies line.

Fig. 10. Cross-section through the upper part of the Upper Devonian and the Tournaisian deposits in the southeastern part of the Alba syncline (the vertical scale is much exaggerated).

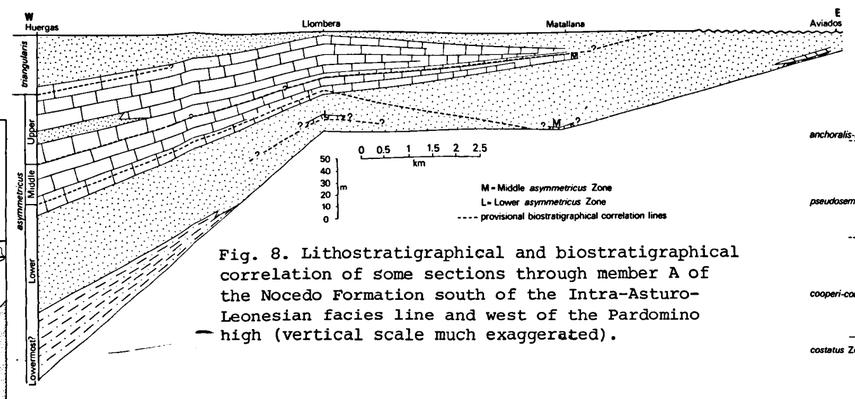


Fig. 8. Lithostratigraphical and biostratigraphical correlation of some sections through member A of the Nocedo Formation south of the Intra-Asturo-Leonesian facies line and west of the Pardomino high (vertical scale much exaggerated).

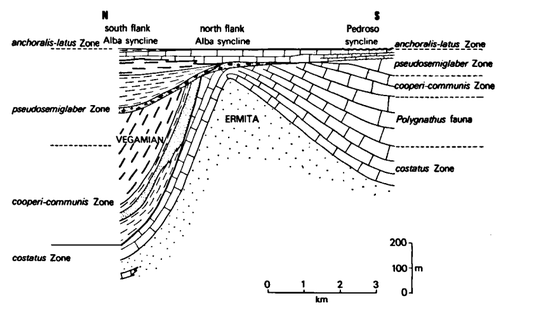


Fig. 11. Generalized cross-section through the southern part of the Bernesga area showing the interfingering of the Ermita and Vegamian and the erosion surface formed during the *pseudo-semiglaber* Zone (for a legend see Encl. 1: Fig. 10; vertical scale much exaggerated).

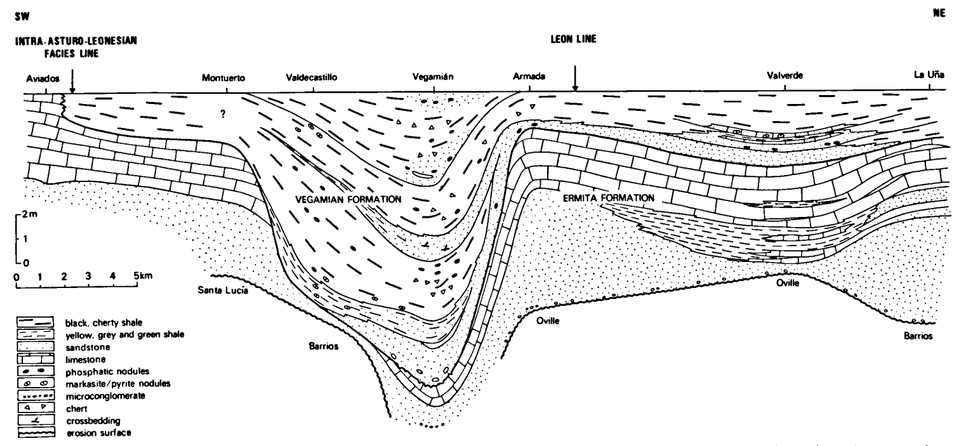


Fig. 12. Cross-section through the Upper Devonian and the Tournaisian deposits in the northeast of the Bernesga area and the eastern part of the Asturian geanticline (the vertical scale is much exaggerated).