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REMARKS ON THE AGE OF EMPLACEMENT OF THE BETIC OF MÁLAGA IN THE SIERRA ESPUÑA, SPAIN

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SUMMARY

Observations in the Sierra Espuña region disprove Paquet's assumption (1966a, 1966b, 1967, 1968) of the transgressive character of his "Auversian conglomerates" and thus of the emplacement of the upper tectonic units of the Betic of Málaga before the Auversian and after the Lutetian.

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INTRODUCTION

According to Paquet (1966a, 1966b, 1967, 1968) the Betic of Málaga of the northern Sierra Espuña consists of a number of tectonic units, – the Morron de Totana unit, the Prat Major unit and the Perona unit – which were emplaced after the deposition of the upper Lutetian and before the transgression of the Auversian. The main argument for this highly important conclusion is the assumed

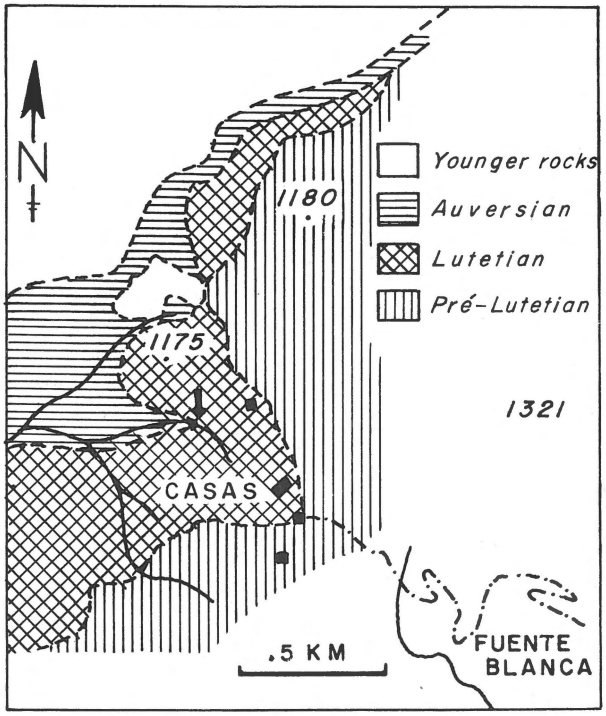


Fig. 1

Geological map of the Fuente Blanca area copied from P a q u e t (1967, fig. 2). On the right bank of the river bed at the locality indicated by the arrow the observations described in the text were made.

transgressive nature of the Auversian, which has allegedly been deposited upon different tectonic units of the Betic of Málaga. The word transgressive is used here in a rather restricted sense, indicating deposition upon previously tectonized and, by implication, emerged and eroded layers. The Auversian consists according to P a q u e t (1967) of a lower interval of 15-20 m of ferruginous conglomerates composed of quartz pebbles of around one centimetre in diameter. These grade upwards into algal limestones with Nummulites, which again pass gradually into the next unit: conglomerates with pebbles of mainly Jurassic limestones.

OBSERVATIONS

During a reconnaissance trip made in the summer of 1968 to the Sierra Espuña the authors have visited the same general area where P a q u e t made his observations (1967, fig. 2). In the riverbed of the Malvariche the boundary between the supposed uppermost layers of the Morron de Totana unit (arenaceous marl-limestones of Paquet's Lutetian) and the basal layers of the allegedly transgressive Auversian was in 1968 beautifully exposed at the locality indicated on fig. 1.

The relation observed between the two stratigraphic units however is quite different from that described by Paquet. The marl-limestones of the Lutetian are conspicuous by the enormous number of large Nummulites which occur in practically every outcrop, however small. The Nummulites are on the average 1.5 cm in diameter and as such quite different from the much smaller Nummulites which appear in the upper part of the Auversian of Paquet. At the boundary of the Auversian, the amount of large Nummulites has decreased considerably and at the same time small pebbles, predominantly consisting of nearly perfectly rounded, polished quartz, have appeared.

The possibility that the outcrop concerned would represent Auversian with redeposited Nummulites from the Lutetian may be excluded since continuous outcrops at the locality concerned show that there are no discontinuities between the Lutetian as characterized by the large Nummulites and the Auversian with the conspicuous quartz pebbles. On the photograph of the outcrop (fig. 2) it is clearly shown that in the same rock the large Nummulites of Paquet's Lutetian occur together with the rounded quartz pebbles of Paquet's Auversian.

CONCLUSIONS

Paquet submits that his Auversian is transgressive upon several tectonic units of the Betic of Málaga of the Sierra Espuña. In other words the "mise-en-place" of these tectonic units led initially to emergence and some erosion, followed by submergence and transgression of the Auversian sea. This contention of Paquet implies therefore a hiatus between the Auversian and the underlying rock units of the Betic of Málaga. Our observations show that there is a rapid, but definite transition between the rocks which both lithologically and cartographically belong to Paquet's Lutetian of the Morron de Totana unit and the allegedly transgressive Auversian. The "transgressive" nature of the Auversian, as characterized by the highly conspicuous quartz pebble conglomerates, is

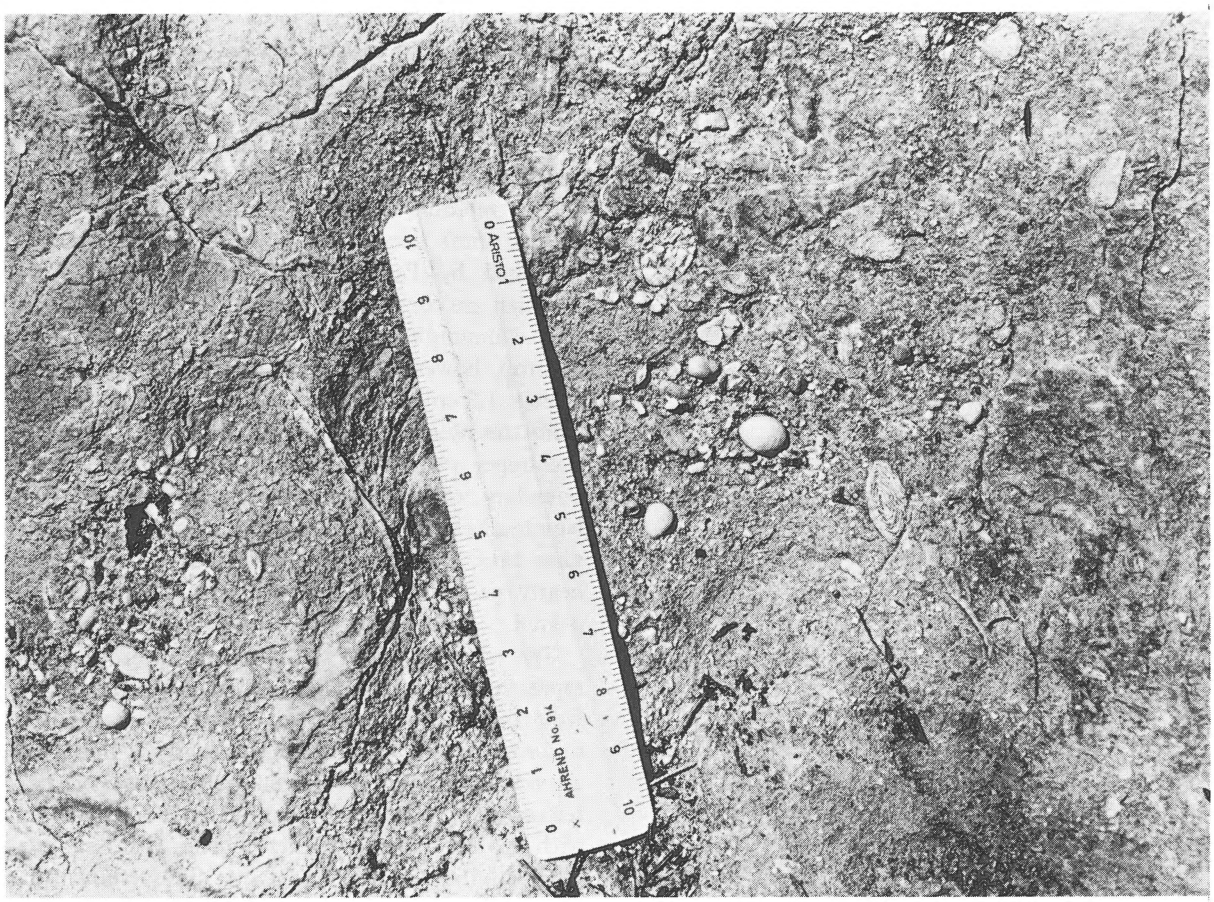


Fig. 2

Photograph of actual outcrop at the locality indicated on fig. 1. The large Nummulites of the "Lutetian" and the beautifully rounded pebbles of the "Auversian" are clearly visible.

thus disproved and consequently the emplacement of the upper tectonic units of the Betic of Málaga can hardly have taken place in the period between the deposition of the Lutetian and the Auversian.

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