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CONTENTS

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NOTES ON A CHALK PEBBLE FROM OVERSTRAND: ANCIENT AND MODERN SPONGE BORINGS MEET ON A NORFOLK BEACH

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ABSTRACT

Two episodes of boring by clionid sponges in a chalk pebble from the beach at Overstrand, north Norfolk, are separated by at least 70 million years. A belemnite guard in the pebble includes **Entobia***? isp. boreholes infilled with lithified chalk. This infestation of borers occurred between death and final burial, that is, during the Late Cretaceous. Other sponge borings, referred to* **Entobia** *isp. cf.* **E. laquea** *Bromley & d'Alessandro, 1984, cover the pebble's surface, lack a lithified infill and are obviously modern; some penetrate the belemnite guard. The age relationships of the borings were determined with relative ease in this beach pebble. However, if such a pebble had been preserved in a lithified conglomerate, it would be less accessible to examination and could present problems of interpretation.*

THE HYDROGEOLOGY OF THE COASTAL ZONE OF NORTH NORFOLK

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ABSTRACT

This paper describes the nature and relative significance of groundwater discharge to the coastal zone of North Norfolk, assessed from the integration of geological information and results from field surveys of groundwater occurrence and salinity. The complex hydrogeology of the barrier coastline is found to be dependent on the inland groundwater catchment area and the geology and tidal regime of the coastal zone. Along the western half of the barrier coastline, west from the River Burn, there is a zone of active groundwater influx determined by a large Chalk groundwater catchment area and a coastal geology dominated by thin Holocene marsh deposits with a high component of permeable coarse clastics (sands and gravels). In contrast, in the eastern half of the coastline, the salt marsh between Wells-next-the-Sea and the mouth of the River Stiffkey is a zone of low groundwater influx controlled by a small groundwater catchment area and with a geology characterised by thick Holocene back-barrier deposits with little coarse clastic material. The remaining coastal sections of reclaimed salt marsh are characterised by a low to moderate groundwater inflow and the presence of glacial sand and gravel beneath Holocene marsh deposits. A hydrogeological conceptual model is presented that identifies several groundwater flow mechanisms of potential groundwater discharge within the coastal system of North Norfolk that demonstrate various pathways for groundwater transfer including: (a) at the land-marsh boundary; (b) to the Holocene marsh deposits; (c) from the beach and dune barrier system; and (d) from the underlying Chalk directly to the sea.

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