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## THE HYDROGEOLOGY OF THE CHALK AQUIFER SYSTEM OF NORTH NORFOLK

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### ABSTRACT

*Hydrogeological properties of the Chalk and Crag aquifers of north Norfolk are discussed based upon available information. To advance understanding of the groundwater flow mechanisms in the Chalk aquifer system, this paper presents the results of an extensive groundwater chemistry study in north Norfolk. Combining the hydrogeological and hydrochemical data has provided an understanding of the Chalk aquifer system. The main findings are that the nature and distribution of the pre-Devensian tills govern aquifer conditions and that the Chalk groundwater becomes more saline eastwards, as the Eocene boundary is approached. In general, the valley zone Chalk groundwaters are modern in age, chemically oxidising in character and contain modern contaminants of a mainly agricultural origin; whereas the interfluvial Chalk groundwaters are old (possibly up to 18,000 years old), chemically reducing in character and of good quality, except for occasional high iron concentrations.*

*Chalk groundwater in areas covered by Lowestoft Till can be distinguished from Chalk groundwater in areas covered by North Sea Drift by a bicarbonate concentration of 300 mg l<sup>-1</sup>. Values in excess of this concentration are associated with the carbonate-rich Lowestoft Till..*



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## DIOLARIA FROM THE NELBOURN ROCK OF EAST ANGLIA

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### ABSTRACT

*A meagre radiolarian assemblage was collected from the Melbourn Rock of East Anglia. The specimens examined had not been replaced by calcite and constitute the first record of siliceous radiolaria from the British Chalk (other than in flint-meal). Although the biostratigraphic information that such a restricted fauna can yield is limited, the presence of **Novixitus mclaughlini** Pessagno constrains the age of the sample to within the Cenomanian.*



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**THE PHRAGMACONE OF *BELEMNITELLA*  
CF. *LANGEI* JELETZKY, 1948**

*Paul S. Whittlesea*

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**ABSTRACT**

*Recent collecting has produced the first recorded specimens of the phragmacone belonging to the belemnite **Belemnitella** cf. **langei** Jeletzky, 1948 preserving the connecting rings and septa, including segments inferred to have come from beneath the proostracum. The structure of the phragmacone is described and significant features compared with those of selected Mesozoic belemnites.*



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**THE OCCURRENCE OF THE ACROTRETIDE BRACHIOPOD GENUS  
?DISCINISCA IN THE EAST NORFOLK CHALK.**

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**ABSTRACT**

*The inarticulate brachiopod ?Discinisca Gray, 1840 is recorded from the upper Upper Campanian and lower Lower Maastrichtian Sponge Beds of Norfolk, eastern England. This is the first record of the genus from the boreal Upper Cretaceous of Europe .*



**AN ELEPHANT SKELETON FROM THE WEST RUNTON  
FRESHWATER BED (EARLY MIDDLE  
PLEISTOCENE; CROMERIAN TEMPERATE STAGE)**

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**ABSTRACT**

*West Runton is the most important fossil vertebrate locality of the Cromer Forest Bed Formation. The West Runton Freshwater Bed, the stratotype for the Cromerian temperate stage (early Middle Pleistocene), has yielded a rich vertebrate fauna, including: 8 fish taxa; 5 amphibians; 3 reptiles; 17 birds; and 43 mammals.*

*The discovery of a very large elephant pelvis in the West Runton Freshwater Bed was followed by an excavation which recovered about 25% of the skeleton of the same individual. The techniques used in excavating the bones and in their subsequent conservation are briefly described.*

*Work so far indicates a male **Mammuthus trogontherii** (an ancestor of the Upper Pleistocene woolly mammoth) with a shoulder height of up to 4 metres. Environmental evidence from fossil plants, molluscs and vertebrates indicates temperate mixed oak forest, some areas of grasses and herbs, and aquatic and waterside vegetation.*

*The distribution of the remains suggests that the carcass collapsed, and largely broke up before burial. The presence of hyaena coprolites, plus characteristic tooth marks on several bones, show that as it lay in the river the dead elephant was scavenged by spotted hyaenas **Crocota crocuta**.*