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**ORIGIN OF THE CHALKY BOULDERCLAY (LOWESTOFT TILL)  
IN NORFOLK AND SUFFOLK BASED ON MINERAL  
MAGNETIC AND FACIES VARIATION**

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**ABSTRACT**

*This paper considers the genetic origin of the Chalky Boulderclay or Lowestoft Till in Norfolk and northern Suffolk based on the hypothesis that the mineral magnetic character of glacial tills reflects its ice sheet source area and/or glacial transport pathway. This tests earlier reports that the mineralogical composition of the non-carbonate fine sand fraction was common to the Chalky Boulderclay and North Sea Drifts, derived from erosion of sediments from the present North Sea area. Statistical analysis of the mineral magnetic results show that fine sediment sources differentiate the 'North Sea Drift' and 'Lowestoft Till' groups. Ratio/Magnetism Variable-derived drift facies (R Variable drift facies) of the 'North Sea Drift' group are clearly associated with the Tertiary Yarmouth Road Beds outcropping on the floor of the North Sea, and characterised by low concentrations of goethite and haematite. In contrast, the 'Lowestoft Till' group is characterised by a narrower range of magnetic minerals but in higher concentration and dominated by varying proportions of magnetite. The source of this sand fraction could be in part the Shouldham Sands in west Norfolk and the Jurassic sandstones in east Yorkshire, but there is an additional magnetite component derived probably from igneous rock in northern England or eastern Scotland. The spatial pattern of R Variable drift facies shows that an equivalent the 'North Sea Drift' group occurs in north Suffolk, whereas over most of the Chalky Boulder Clay plateau a Marly Drift (Lowestoft Till) facies occurs as a thick surface layer.*

## PILOT STUDY IN DIFFERENTIATING NORTH NORFOLK GLACIAL SEDIMENTS USING MINERAL MAGNETIC DATA

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### ABSTRACT

*Pilot mineral magnetic data from the fine-sand fraction of glacial sediments from north Norfolk suggest that two magnetic parameters, the Absolute Saturation Isothermal Remanent Magnetism (A1000 mT) and the Median Destructive Field (MDF) may help discriminate glacial sediments of Anglian and Devensian age. Samples are most obviously separated by the large range in A1000 mT values. One group of glacial sediments have A1000 mT values between 170-340, implying a high concentration of magnetic minerals. MDF variability is low in this group, around 40-50, probably indicating the presence of easily magnetised magnetite. This group might represent a magnetically distinct Devensian 'Hunstanton Till'. The second group of glacial sediments has A1000 mT values mostly below 40, implying low concentrations of magnetic minerals, but with variable MDF values (45-70). This second group has A1000 mT and MDF values within error of previously published data for Anglian tills elsewhere in Norfolk. In some localities, particularly in the Cley-Blakeney-Warham area, these magnetically distinct sediments are in close juxtaposition. The identification of glacial sediments with 'Hunstanton Till' and 'Anglian till' magnetic character supports earlier work which suggested that at least two groups of glacial sediments are present on the north Norfolk coast. A more complete study of glacial sediments in north Norfolk, using the techniques outlined here along with traditional sedimentological and mineralogical data, is needed to confirm these initial findings and extend the geographic coverage.*

# Brian M. Funnell (1933 - 2000)

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**ON THE OCCURENCE OF ECHINOID SPINES REFERABLE TO  
THE FAMILY ECHINOTHURIIDAE THOMSON, 1872  
FROM THE NORWICH CHALK**

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**# INTRODUCTION**

*The two Cretaceous echinoid spines discussed in this note were recovered from an old Chalk pit, recorded by the author as the Groundsman's Pit. Earlham Park. Norwich (TG 191 081), adjacent to the University of East Anglia. The chalk in this the pit belongs to the upper Upper Campanian, zone of **Belemnitella mucronata**, Pre-Weybourne 3 Chalk as defined by Wood (1989) (= zone of **B. mucronata** sensu Christensen, (1995)).*

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**REPORT OF SOCIETY FIELD MEETINGS IN 2001**

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**# SUMMARY**

*This account describes only those field meetings organised in conjunction with the Suffolk Naturalist Society and led jointly by Bob Markham and the author. The first two meetings of the season, 'Kings Lynn springs and pingoes' and 'Box-stone Bonanza' were cancelled because of the foot-and-mouth epidemic.*

*Weybourne Cliff (July), Complementing earlier observations on the Cromer Tills (Contorted Drift) (West Runton trip, July, 2000). Fossil collection and further observations on the Cromer Tills, Campanian Chalk base, Weybourne Crag and overlying Stone Bed.*

*The Sudbury Area (August), The stratigraphy of the Sudbury area, a successional overview gained from observations made in five Chalk and clay pits.*

*Pakefield (September), Examination of the Anglian Jurassic-rich Chalky Boulderclay, the underlying Corton Beds, the Cromer Forest Bed and fossil collection.*

*East Mersea (October), Interpretation of the morphology of an intertidal section west of Cudmore Grove. Containing London Clay, the Cudmore Gravels, channels infilled with silt and clay sequences and the Restaurant Gravels at the furthest extent of the section. Discussion of dating recent sediments via the timing of species introductions.*

# No formal abstract available for this paper. (Summary accounts of field trips, 2001)

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