

PLEISTOCENE INTERGLACIAL HERPETOFAUNA OF THE GREENLANDS PIT, PURFLEET, ESSEX

J. ALAN HOLMAN

Michigan State University Museum, East Lansing, Michigan 48824-1045 U.S.A.

JOHN D. CLAYDEN

Sunnyholme, Lower Common, East Runton, Cromer, Norfolk NR27 9PG

INTRODUCTION

The Greenlands Pit Quarry (TQ 568785) is a Pleistocene interglacial fluvial deposit that has yielded fossil bivalves, aquatic gastropods, land snails, fishes and mammals (Snelling, 1975; Allen, 1977; Wheeler, 1984), but the herpetofauna has not been recorded. Herpetological remains were collected by John D. Clayden from the Greenlands Pit in 1971, and these fossils form the basis of the present report.

The herpetological fossils came from 0.4m above the base of the laminated sandy silt stratum reported by Allen (1977, p. 2). The amphibians and reptiles came from a shelly seam, 7.5-15cm thick. This seam also yielded fishes (sturgeon, *Acipenser sturio*; eel, *Anguilla anguilla*; pike, *Esox lucius*; rudd, *Rutilus erythrophthalmus*; roach, *R. rutilus*; silver bream, *Abramis bjoerkna*; and dace, *Leuciscus leuciscus* (Wheeler, A., 1984, letter to J.D. Clayden, 11 December). The sturgeon and the eel indicate that this Pleistocene site was connected to the sea. The other fishes are found in freshwater rivers; the rudd, roach and silver bream in slow-flowing rivers, the dace in cooler streams and rivers (Newdick, 1979).

The exact age of the deposit is in doubt. Hollin (1977) took pollen samples from the laminated sandy silt bed reported on by Allen (1977), but the results were not conclusive enough to assign the bed to either the Ipswichian or the Hoxnian interglacial stage with any degree of certainty. Allen (1977) has pointed out that it is possible that the deposit was laid down during another interglacial stage between the Hoxnian and the Ipswichian. Despite the lack of an agreed upon date which we hope will be forthcoming in the future, it is important to put this fossil herpetofauna on record with the other faunal elements from Greenlands Pit.

SYSTEMATIC PALAEOLOGY

Numbers are from the John D. Clayden Collection (abbreviated JC), Sunnyholme, East Runton Cromer, Norfolk NR27 9PG.

Bufo bufo (Linnaeus). Material: a scapula (JC-GP883) from a large adult and a sacrum (JC-GP889). The scapula was identified using characters given in Hallock, Holman and Warren (1989). The sacrum was identified using characters of Böhme (1977). The species occurs in the area today (Frazer, 1983).

Rana arvalis arvalis Nilsson. Material: a right ilium (JC-GR8816). The ilium of this form is diagnostic to the subspecific level (Böhme 1977; Holman, 1987a,b). This form has previously been reported from Cromerian interglacial sites at Sugworth near Oxford (Holman, 1987b) and West Runton, Norfolk (Holman, Clayden and Stuart, 1988), and from the Ipswichian interglacial site at Swanton Morley, Norfolk (Holman, 1987a). *Rana arvalis* does not occur naturally in Britain today, but occurs in the low countries of the European Continent (Arnold and Burton, 1985, p.258, map 37).

Rana temporaria Linnaeus. Material: right ilium (JC-GP8817). The ilium of *Rana temporaria* is quite diagnostic at the specific level (Böhme, 1977; Holman, 1985). The species occurs in the area today (Frazer, 1983).

Rana sp. indet. Material: humerus (JC-GP887), sacrum (JC-GP8817), and right ilium (JC-GP881). These elements are too fragmentary to be diagnostic at the specific level.

Anguis fragilis Linnaeus. Material: five vertebrae (JC-GP884-8). Holman (1985) discusses the

fact that many slow worm bones are diagnostic at the specific level, especially vertebrae. *Anguis fragilis* occurs in the area today (Frazer, 1983).

Natrix cf. *Natrix natrix* (Linnaeus). Material: six vertebrae JC-GP8810-15. These vertebrae appear inseparable from those of modern *Natrix natrix* even though the fossils are somewhat fragmentary. The species has been recorded in the general vicinity of the area today, but not in the immediate area (Frazer, 1983, fig. 43).

COMMENT

The herpetofauna species of the Greenland Pit fauna would be typical of the marshy and other low areas near the slow-flowing river suggested by the fish fauna. The present report provides the fourth record of *Rana arvalis arvalis*, a continental form that does not occur naturally in Britain today, from Pleistocene interglacial sites in England.

REFERENCES

- Allen, T. (1977). Interglacial sea-level change: evidence for brackish water sedimentation at Purfleet, Essex. *Quaternary Newsletter* 22, 1-3.
- Arnold, E.E. and Burton, J.A. (1980). *A field guide to the reptiles and amphibians of Britain and Europe*. Collins, London.
- Böhme, G. (1977). Zur bestimmung quartärer anuren Europas an hand von skelettelementen. *Wissenschaftliches Zeitschrift der Humboldt-Universität zu Berlin, Mathematik-Naturwissenschaft* 26, 283-300.
- Frazer, D. (1983). *Reptiles and amphibians in Britain*. Collins, London.
- Hallock, L.A., Holman, J.A. and Warren, W. (1989). Herpetofauna of the Ipswichian interglacial bed (late Pleistocene) of the Itteringham Gravel Pit, Norfolk. Manuscript submitted to *Journal of Vertebrate Paleontology*.
- Hollin, J.T. (1977). Thames interglacial sites, Ipswichian sea levels and Antarctic ice surges. *Boreas* 6, 33-52.
- Holman, J.A. (1985). Herpetofauna of the Pleistocene fissures near Ightham, Kent. *Herpetological Journal* 1, 26-32.
- Holman, J.A. (1987a). Herpetofauna of the Swanton Morley site (Pleistocene: Ipswichian), Norfolk. *Herpetological Journal* 1, 199-201.
- Holman, J.A. (1987b). Middle Pleistocene herpetological records from interglacial deposits at Sugworth near Oxford. *British Herpetological Society Bulletin* 21, 5-7.
- Holman, J.A., Clayden, J.D. and Stuart, A.J. (1988). Herpetofauna of the West Runton Freshwater Bed (Middle Pleistocene; Cromerian Interglacial), West Runton, Norfolk. In press, *Bulletin of the Geological Society of Norfolk* 38, 1-16.
- Newdick, J. (1979). *The complete freshwater fishes of the British Isles*. Adam and Charles Black, London.
- Snelling, A.J.R. (1975). A fossil molluscan fauna at Purfleet, Essex. *Essex Naturalist* 33, 104-108.