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MIDDLE PLEISTOCENE HERPETOLOGICAL RECORDS FROM INTERGLACIAL DEPOSITS AT SUGWORTH, NEAR OXFORD

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INTRODUCTION

Few herpetological species have been recorded from Cromerian (Middle Pleistocene: Interglacial) deposits (Stuart, 1979, 1982; Holman, Clayden and Stuart, 1987). Thus, the identification of herpetological remains, two representing the exotic species *Rana arvalis arvalis* Nilsson, from a cromerian site near Oxford should be recorded. These specimens were collected by Dr. A. J. Stuart of the Castle Museum, Norwich. Dr. J. Clack of the University Museum of Zoology, Cambridge, kindly arrangd for me to study the specimens in Cambridge in August, 1986. I gratefully acknowledge these people as well as United States National Science Foundation Grant BSR-851-5665. Specimen numbers refer to the University Museum of Zoology, Cambridge (UMZC).

THE SUGWORTH SITE

The Sugworth fossiliferous channel fill has yielded a moderate number of Cromerian vertebrates, mainly of small size (Stuart, 1980). The site is about 4 kilometers east of Abington, Berkshire about 1.5 kilometers west of the River Thames. Unfortunately, the deposits now are buried beneath concrete in the sides of a cutting for the A 34 by-pass (Shotten et al., 1980). The site represents a series of Pleistocene channel fills into the Jurassic Kimmeridge Clay. The channels appear to represent an old meandering channel of the Thames that was much larger than the modern one (Briggs et al., 1980). The main channel fill was the only one that produced fossils. It was about 180-200 meters wide and up to 5 metres deep. It was made up of organically rich silts and sands, trending laterally into sands and gravels and upwards into about 0.5 metres of yellowish silty clay. The organic deposits were rich in plant macrofossils, pollen, freshwater moluscs, beetles, and vertebrates. The dating evidence is summarized in Shotten et al., (1980).

The herpetological material reported on here was collected by Dr. A J. Stuart from the main channel exposure. Fifteen samples of about 20 kilograms each were taken from horrizons A-E (A being the lowest). The position of these samples in the section are given in Shotten et al. (1980, fig. 4). Fossils were taken by using a 1 mm. wet sieve and by drying and sorting the materials from the concentrate. Important fossil publications from the Sugworth site are Gibbard and Pettit (1978) plaeobotany, Osborn (1980) beetles, Gilbertson (1980) molluscs, Robinson (1980) ostracods, and Stuart (1980) fishes, *Rana* or *Bufo,* cf.*N. natrix*, and mammals.

HERPETOFAUNAL SPECIES

Class Amphibia
Order Caudata
Salamander Indeterminate

Material.– A. T. Stuart Collection UMZC: SG 465, a limb fragment from Sample D 16. I am unable to identify this fragment to family or genus, but it does not appear to be *Triturus.*

Order Anura

The following identifications are from material listed by Stuart (1980) as "*Rana* sp. and/or *Bufo* sp., frog and/or toad".

Indeterminate Anuran Fragments

Material.– A. T. Stuart Collection UMZC: SG 58, a humeral fragment from Sample B2; SG 59, a humeral fragment from Sample B2; SG 60, a humeral fragment from Sample B2; SG 431; a humeral fragment from Sample B2; SG 431, a humeral fragment from Sample D4; SG 355, a partial radioulna from Sample C7; SG 371, a partial radioulna from Sample C9.

I am unable to assign these elements to family or genus.

Family Ranidae
Rana sp. indet.

Material.– A. T. Stuart Collection UMZC: SG 646, a fragmentary ilium from Sample B18. This bone is too incomplete to identify to species. The genus *Rana* may be distinguished from other European genera on the basis of the ilium. In *Rana* there is a well developed, thin ilial blade (vexillum of Böhme, 1977) that is absent from other European genera (Fig. 1).

Rana arvalis arvalis Nilsson

Material.– A. T. Stuart Collection UMZC: SG 190, right ilium from Sample B3; SG 647, left ilium from Sample B18. The ilium of *R. a. arvalis* is diagnostic at the subspecific level (Böhme, 1977, p. 295, Fig. 9d). The ilium of *R. a. arvalis* differs from *R. temporaria* and *R. graeca* in having a much better developed ilial blade (vexillum). The ilium of *R. a. arvalis* may be distinguished from the "water frogs", *R. ridibunda, R. "esculenta"*, and *R. lessonae*, in having a much more slender junctura ilio-ischiadic (Fig. 1). Finally, *R. a. arvalis* may be distinguished from *R. dalmatia* and *R. latastei* in having the dorsal border of the ilial blade (vexillum) sloping downward rather than upward from the tuber superior (Fig. 1).

This species does not occur naturally in Britain today, but occurs on the continental coast adjacent to England (Arnold and Burton, 1980, fig. 37, p. 258). *Rana a. arvalis* has also been reported from the late Pleistocene (Ipswichian:Interglacial) of Swanton Morley, Norfolk, (Holman, 1987) and from the middle pleistocene (Cromerian:Interglacial) of West Runton, Norfolk, (Holman, Clayden, and Stuart, 1987).

Class Reptilia
Order Squamata
Indeterminate Snake Vertebra

Material.– A. T. Stuart collection UMZC: SG 430, a fragmentary vertebra from sample B18. I am unable to identify this fragmentary snake vertebra to family or genus. I was unable to locate the two vertebrae that Stuart (1980) referred to as cf. *Natrix natrix*.

COMMENT

The presence of *Rana arvalis arvalis*, a continental form that does not occur in Britain today, from the middle Pleistocene (Cromerian: Interglacial) is of considerable interest, but not unexpected, as this species has been reported from two other British Pleistocene interglacial sites (Holman, 1987; Holman, Clayden and Stuart, 1987). Britain was part of the European continent during the times *R. a. arvalis* has been reported as a fossil (Cromerian twice, Ipswichian once) and the climate must have been at least as mild as it is today during the time these fossil frogs lived.

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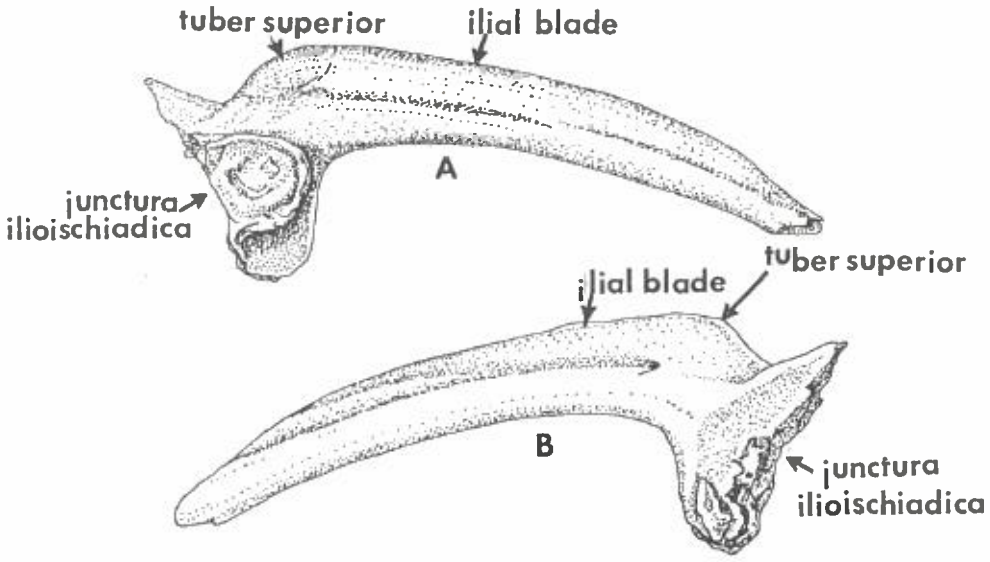

Figure 1. Generalized ilium of *Rana* (drawn from *Rana ridibunda* Michigan State University Museum Number 3881 by Rosemarie Attilio) to illustrate the terminology used in the identification of *Rana* sp. indet. and *Rana arvalis arvalis* Nilsson. A, lateral view; B, medial view.