PHILOSOPHICAL TRANSACTIONS OF THE ROYAL SOCIETY B BIOLOGICAL SCIENCES

The Quaternary Deposits at Hoxne, Suffolk: Appendix 3. The Non-Marine Mollusca of the Hoxne Interglacial

B. W. Sparks

Phil. Trans. R. Soc. Lond. B 1956 **239**, 351-354
doi: 10.1098/rstb.1956.0004

Norwegian rocks. The erratics from the upper glacial gravel at Hoxne therefore belong to the Gipping phase, and the interglacial deposits here are confirmed as occurring between the Lowestoft and Gipping glacial phases, in spite of the fact that the position of Hoxne lay in an area just outside the margin of the Gipping ice-sheet.

Appendix 3. The non-marine Mollusca of the Hoxne Interglacial

By B. W. Sparks

Department of Geography, University of Cambridge

Unlike many other interglacial deposits the lake beds at Hoxne have never yielded a large fauna of Mollusca, although several collections have been made. In addition some confusion concerning the horizons of the faunas has arisen both from apparent misinterpretations of the stratigraphy and from lumping the shells from several horizons into one list.

The first collection was made by Prestwich (1860) from his bed *d*, that is from strata B or C of the present account, which have been shown in the main part of this paper to be solifluxion deposits containing much derived material. Thus the fauna is probably largely derived. The shells found by Prestwich are the following (the names have been changed in accordance with the latest British list (Ellis 1951)):

Valvata piscinalis (Müller)
Bithynia tentaculata (Linné)
? *Lymnaea* (*Galba*) *truncatula* (Müller)
L. (*Stagnicola*) *palustris* (Müller)
Planorbis (*Anisus*) *leucostoma* Millet
? *P.* (*Gyraulus*) *albus* Müller
Succinea (*Succinea*) *putris* (Linné)
? *Hygromia* (*Trichia*) *hispida* (Linné)
? *Retinella* (*Aegopinella*) *nitidula* (Draparnaud)
? *Sphaerium corneum* (Linné)
Pisidium amnicum (Müller)
Unio sp.

Nearly forty years later Reid (1896) discovered small faunas at several horizons, but, through an apparent misinterpretation of the stratigraphy of the deposit, he listed shells from what appears to be our stratum F twice, as his beds A and E. The following species were found at this level, at which the pollen evidence suggests a somewhat bleak climate:

Valvata piscinalis (Müller)
Bithynia tentaculata (Linné)
B. leachi (Sheppard)
Lymnaea (*Radix*) *peregra* (Müller)
L. (*Myxas*) *glutinosa* (Müller)
Planorbis (*Anisus*) *leucostoma* Millet
P. (*Gyraulus*) *albus* Müller
P. (*Armiger*) *crista* (Linné)
Segmentina (*Hippeutis*) *complanata* (Linné)
Sphaerium corneum (Linné)
Pisidium personatum Malm
P. pulchellum Jenyns
Unio or *Anodonta* sp.

From stratum D, which was deposited after the climatic optimum of the interglacial period, Reid obtained only the following two species:

Valvata piscinalis (Müller)
Pisidium sp.

From stratum C Reid listed the following species:

Valvata cristata Müller
V. piscinalis (Müller)
Bithynia tentaculata (Linné)
Lymnaea sp.
Sphaerium corneum (Linné)
Pisidium personatum Malm

To this list can be added *Pisidium casertanum* (Poli), which was found in some of Reid's material from the Ipswich Museum.

The position was then reviewed by Kennard & Woodward (1922), who examined the shells available in the British Museum. Unfortunately, they produced a combined list from all horizons, most of the species being included on Prestwich's or Reid's authority. The list is unsatisfactory for this reason and also because it omits common Hoxne species, such as *P. crista* and the small species of *Pisidium*, which had been reported in earlier lists. It adds *Valvata antiqua* and *Oxychilus cellarius*, neither of which had been included in earlier lists. A specimen of *O. cellarius* is still to be found in the British Museum, but its general condition is somewhat different from that of the Hoxne shells, and one wonders whether the shell really came from Hoxne.

Presumably from a later re-examination of existing material Kennard & Woodward (1928) added three species of *Pisidium*, namely *milium* Held, *nitidum* Jenyns and *tenuilineatum* Stelfox, but they did not state the horizons from which they came.

In 1935 Kennard and Oldham determined a series of shells from stratum F for Moir (in Moir 1935); this was the first list to give any idea of the relative abundance of the species, which were the following:

Valvata piscinalis (Müller)	common	*Sphaerium corneum* (Linné)	rare
Lymnaea (*Myxas*) *glutinosa* (Müller)	common	*Pisidium obtusale* (Lamarck)	rare
Planorbis (*Gyraulus*) *laevis* Alder	rare	*P. milium* Held	rare
P. (*Armiger*) *crista* (Linné)	abundant	*P. nitidum* Jenyns	common

During the 1953 excavations an opportunity was provided for collecting from strata F and E, but only the former proved very fossiliferous. From it were obtained the following numbers of each species:

Valvata piscinalis (Müller)	129	*Sphaerium corneum* (Linné)	24
Lymnaea (*Galba*) *truncatula* (Müller)	3	*Pisidium casertanum* (Poli)	1
L. (*Radix*) *peregra* (Müller)	126	*P. obtusale* (Lamarck)	20
Planorbis (*Gyraulus*) *laevis* Alder	580	*P. milium* Held	11
P. (*Armiger*) *crista* (Linné)	558	*P. subtruncatum* Malm	9
Segmentina (*Hippeutis*) *complanata* (Linné)	64	*P. henslowanum* (Sheppard)	1
Vertigo antivertigo (Draparnaud)	1	*P. nitidum* Jenyns	93
V. pygmaea (Draparnaud)	1	*P.*? *pulchellum* Jenyns	5
Agriolimax sp.	1		

From the upper part of stratum E were obtained the following two species:

Bithynia tentaculata (Linné)	5 opercula	*Valvata piscinalis* (Müller)	52

It is obvious from the foregoing that only stratum F has yielded a fauna of any size, as the shells recorded from the other strata by Prestwich and Reid have probably been derived from lower horizons while only two species have been recorded from stratum E and two from stratum D.

In order to obtain as accurate a list as possible for stratum F all the shells from earlier collections, traceable in the British Museum, the museum of the Geological Survey and the Ipswich Museum, were examined. As a result of this *Bithynia tentaculata*, *Pisidium albus* and *Unio* or *Anodonta* sp. can certainly be added to the 1953 list. *Pisidium leucostoma*, a very common

shell in Pleistocene deposits, can in all probability be included, although no specimens could be found. *P. personatum*, of which no specimens could be traced, may have been a mistake for *P. obtusale*, which resembles it in some features and which is not uncommon at Hoxne.

No specimens of *Bithynia leachi* could be discovered. The record of *Lymnaea glutinosa* is in all probability a mistake, as all the specimens obtained from the Ipswich and London museums appear to be the form of *L. peregra* common at Hoxne. This bears a superficial resemblance to *L. glutinosa* in that it has a low spire and an inflated body whorl, but a comparison of the Hoxne shells with modern *L. glutinosa*, kindly lent by Mr A. E. Ellis, leaves little doubt that the Hoxne species is *L. peregra*. In addition, the shell is much too thick for *L. glutinosa*, which has an exceedingly fragile shell and is hardly likely to survive commonly as a fossil.

Two other records, which may refer to stratum F, have also to be rejected. In 1922 Kennard & Woodward listed *Valvata antiqua*, which had not been recorded before and has not been found since and which is often considered to be merely a variety of *V. piscinalis*. Specimens labelled *Pisidium tenuilineatum* from Kennard's Collection are all normal *P. obtusale*, a diagnosis kindly confirmed by Mr A. E. Ellis.

The whole assembly of shells found at Hoxne is peculiar in a number of respects. At no horizon has any characteristic southern form been found, although the beds include a large part of the interglacial period, and at no horizon has any real northern form been discovered, although stratum F must have been deposited in a rather cold climate soon after a glaciation. The only possible exception is the somewhat doubtful record of *Oxychilus cellarius*, which is much more common in beds indicating interglacial conditions than in those indicating cold conditions.

The reason for this may be partly the predominance of freshwater species, which are much poorer indicators of climate than land snails. Only the 1953 list has recorded any land snails from stratum F and in that there are only three, the single specimens of the species of *Vertigo* and *Agriolimax*. At higher levels Prestwich found *Succinea putris*, ?*Hygromia hispida* and ? *Retinella nitidula*, which together with the doubtful record of *Oxychilus cellarius*, are the only other land snails present. Such a scarcity of land snails is very unusual, but may partly be explained by the fact that only the central parts of the lake basin, distant from the shore, have been preserved.

No extinct species has ever been found at Hoxne. This is very strange, as deposits of probably comparable age, e.g. those at Swanscombe and Clacton, show a number of extinct species, as also do much later deposits, such as the Last Interglacial deposits near Cambridge and many early Holocene deposits. In fact, the Hoxne fauna, both from its general composition and from the fresh state of many of the shells, might well be mistaken, without the botanical and stratigraphical evidence, for a very ordinary Holocene fauna. The only unusual feature is the great number of *Planorbis laevis*, which to-day is very local in its distribution.

The peculiar nature of the fauna may reflect in part the isolation of the locality, as most known interglacial faunas have been found in the major drainage basins of England. But rich early Holocene faunas are known from some fairly isolated localities, e.g. Tile Kiln Green near Takeley, Essex. In any case it is difficult to see why a richer fauna did not

PHILOSOPHICAL TRANSACTIONS OF THE ROYAL SOCIETY B BIOLOGICAL SCIENCES

appear above stratum F, as there was the whole length of an interglacial period for the fauna to reach the locality and the rate of recolonization of the areas covered by the ice in the Last Glaciation appears to have been quite rapid.

The Hoxne Mollusca really add little to the botanical conclusions. It is a nondescript fauna, which could have survived quite cold or quite warm conditions but gives no positive indication of climate. Neither do the faunas at different horizons give definite indications of climatic variation. Molluscan faunas vary from place to place and, although deposits in the main drainage basins can often be satisfactorily correlated, there is always the possibility, as appears to be the case at Hoxne, of unusual faunas in isolated localities.

Appendix 4. The Hoxne mammalian remains

By H. E. P. Spencer

Ipswich Museum

The mammalian remains from Hoxne are few in number and variety. Of the fossils which have been collected only a part have been preserved. Most of these are in the collections at Ipswich Museum and are from Moir's (1926, 1935) excavations, and these are listed below. The stratigraphical horizon is given where known.

Trogontherium sp. Femur and eight molars from stratum E. Provisionally determined by Dr T. M. Stout as *T. lydekkeri* Schlosser.

Cervus elaphus L. Limb bones, antler fragments and a vertebra. These remains represent at least six animals. A radius and a metacarpal were found together in stratum F lying on the Lowestoft Till; these were the only finds during the recent investigations. Their position in the stratigraphy was verified by pollen analysis (no. 10, table 5) of sediment from the bone surface.

Bos or *Bison* sp. Tooth and a limb bone.

Equus caballus L. Teeth and limb bones. These belong to at least eight beasts. Several of the teeth are known to have come from stratum A2.

Elephas sp. Ilium.

In addition to these records Reid (1896) recorded from his bed A, *Cervus*, *Bos*, *Equus caballus* and *Elephas*. Moir (1926) referred to remains of mammoth and reindeer from stratum B, but no teeth of the former can be traced, and the latter is based on an erroneous determination. The fragments of a right metatarsal, labelled reindeer, in the Ipswich Museum from the 1926 excavations, proved to belong to red deer when they were restored. *Sus* sp. was also recorded by Moir (1935).

The remains of the fauna from Hoxne are too scanty to enable generalizations to be made on the significance of the finds.

PHILOSOPHICAL TRANSACTIONS OF THE ROYAL SOCIETY B BIOLOGICAL SCIENCES