LITTLE HOYLE CAVE, TENBY, PEMBROKESHIRE: STEPHEN ALDHOUSE-GREEN'S EXCAVATIONS 1984–1990

APPENDIX 5: BIRD REMAINS

by

ANNE EASTHAM

Species notes - Wildfowl

The goose bones Anserini

Apart from a single vertebra that might be compared with a barnacle goose from the McBurney excavation on the North Platform, all the geese were recovered from T5 in the North Cave. A detailed study of individual elements appears to show that four species were present. Most abundant were the barnacle geese but besides them three species of *Anser* have now been identified on the basis of skeletal morphology and this has implications for the ecology and the occupation of the site as a whole.

Barnacle geese *Branta leucopsis* were recovered from all levels in T5, they were most numerous in Layer 2: along with smaller number of pink footed geese, *Anser brachyrhyncos*, and lesser white front goose, *Anser erythropus*. Only one bone of *Anser albifrons*, white fronted goose, was identified, a single coracoids in Layer 3. Besides using records of measurements based on Bacher (1967), it was found that there are perceptible details in the bone morphology by which it is possible to distinguish between the bones of *Anser* and *Branta* families of goose.

Table 5.1 shows the skeletal elements for each species recovered from Layer 2, in which the majority of the goose bones were found. The final column indicates where no firm determination of species could be made. Anatomical references are taken from Baumel (1979). In all the levels there was a greater frequency of bones from the wing and axial skeleton than from the hind limb. The distribution of elements is described in Table A5.1.

In order to separate these species, a detailed comparison was made between bones of Branta leucopsis and the Anser species. Examination showed certain morphological differences that appear to be consistent across all species within each group and available reference material.

Coracoideum: In *Branta leucopsis* there is a marked development of the bony process at the annulus medialis that extends down the shaft of the coracoids on both the ventral and caudal aspects of the bone. This is missing in the *Anser* species that retains an almost unbroken curve on either margin. The facies *articularis sternalis* of barnacle goose is also thicker and more pronounced on both caudal and ventral faces than it is with any of the *Anser* species. Further characteristics that differentiate the two groups are a smaller and deeper foramen pneumatic in the *sulcus supracorocoideii* and a larger *foramen nitricium* below the *cotyla scapularis* in the barnacle goose. Examples of *Anser* type coracoids, include specimens numbered: NC 153; NC 177 and NC 190; these compare with: NC 99; NC 261 or NC 140, specimens that show *Branta* characters.

Table 5.1. *Bones of geese North Cave T5, Layer 2.*

Bone Species	***A. brachyrhyncos***	***A. erythropus***	***A. albifrons***	***Branta leucopsis***	***Anser/Branta***
Cranium					
Maxilla					
Mandible					
Vertebra					5
Coracoid	1	1		13	4
Scapula		2		5	
Sternum				2	
Humerus		1		10	
Radius				9	
Ulna	2			7	
Carpometacarpus		1		12	
Os carpi		2 ulnare		1 radiale	
Phal. dig. Major		P2:3		P1:2p2:2	
Pal. dig. Minor					
Pelvis synsacrum					
Acetabulum					
Femur				4	
Tibiotarsus	2			3	
Fibula					1
Tarsometatarsus				3	1
Pes phalanges					7
Claws					
Total (106)	**5**	**10**		**72**	**18**

Scapula: It is possible to distinguish the *Anser* from the *Branta* forms of the scapula from the cranial extremity. In the barnacle goose the *acromium* is more robust and the foramen behind the *tuberculum coracoideum* is larger and deeper than in the *Anser* species. The comparison is clear between sample number NC 51 and NC 58 that carry *Anser* features and NC 236 that belongs to *Branta*.

Humerus: The clearest difference between the humeri of *Branta* and *Anser* is the structure of the *fossa pneumotricipitalis* that is larger and more open in the barnacle goose than in the *Anser* group. It is noticeable that the *tuberculum ventral* is far more fully developed in the *Anser* species.

Ulna: The distinction between the ulnae in Layer 2 was made on the basis of measurement, the size difference between pink footed geese and barnacle geese of either sex is sufficiently marked. It is possible to see some differentiation in the lines of musculature, but it is slight and might be an effect of biological variation between individuals of the same species.

Carpometacarpus: The proximal epiphysis of the *Anser* group may be distinguished from the *Branta* by the shorter and more robust proportions of the processes *alulare* and *extensorius* and the process *pisiformis* that protrudes at a sharp angle from the head of the bone while on the barnacle geese it lies flat to the *os metacarpale*. Similar distinction can be made between the small carpel bones, though these are difficult to illustrate effectively.

Tibiotarsus: Bones from the lower limb are few in number. Two from Layer 2 were identified as *Anser brachyrhyncos* from comparative measurements (Bacher 1967). Both were broken but considerably larger than those of barnacle goose.

The study of the morphology of the bones indicated that there was a mixed population of geese species present in T5. In order to evaluate the implications of this for the occupation of the site, it is necessary to consider the habitat requirements and ethology of the individual species at the present day and where these overlap. All species are migratory, and gregarious outside the breeding season.

The distribution of the pink footed goose, *Anser brachyrhyncos*, is concentrated in the Atlantic side of the western Palaearctic. It breeds in central Iceland, east Greenland and west Spitzbergen using snow free hummocks and rocky ledges as protection against predators and floods. The main northward passage takes place during April and eggs are laid between mid-May and mid-June and hatch early in July. The Greenland population begins to disperse south to join the Iceland breeders during late August to September and movement to Britain starts in October. Birds breeding on Spitzbergen mainly winter in Denmark, Germany and the Low Countries. Winter habitats include estuarine mudflats, freshwater lakes and moorland, feeding on grass but also, preferentially, on cereals and root crops.

Anser albifrons, the white fronted goose, breeds in the arctic tundra of Russia, Novaya Zemlya and Greenland and different groups migrate over several weeks to a variety of lowland habits during the winter. The winter range reaches from the southern Caspian and the Tigris and Euphrates valleys to Ireland the west of Scotland and Wales. In Britain it will occupy marshy ground, meadows and arable lands from September/October until late April or May.

The lesser white fronted goose, *Anser erythropus*, breeds further south than other *Anser* species, choosing sites on shrubby ground away from the sea, close to wooded tundra in Fenno-Scandia, northern Russia and Siberia. Populations declined during the twentieth century and recent records show that at present there are several separate wintering areas. In Europe these are mainly in the continental climatic zone of Eastern Europe where open grassy ground is preferred. Here they will mix with related species but at the present day their presence on British wintering sites is accidental. Nevertheless, the bones in the sample are distinctive and considerably smaller than the other *Anser* geese – even allowing for the normal parameters of sexual dimorphism. A deterioration of climate during periglacial periods and increased continentality of the climate in Britain and Europe is likely to have extended the winter range westwards.

The barnacle goose, *Branta leucopsis*, breeds in the extreme arctic. Preferred nest sites are inaccessible cliff ledges or small islands and the birds move to lower ground to feed. Unlike the *Anser* species, they are gregarious both during the breeding season and in wintering locations. There are currently three distinct breeding populations that move to separate wintering areas in Western Europe. Those that breed on the east coast of Greenland gather in late August and fly via Iceland to Scotland and the west coasts of Ireland in September, arriving mid-October onwards. The Spitzbergen birds

arrive in the Solway Firth by way of the west coast of Norway in late September / early October and the Novaya Zemla population migrates south west along the Baltic coasts to the Netherlands. During the winter the preference of all these groups of geese is for terrestrial grazing on pasture and marshland grasses. It is at that season that the different species tend to congregate.

With such separate breeding locations, it is difficult to reconcile the coincidence of all four species of geese along the hinterland of the then extended Severn Estuary during a summer season. On the basis of the known behaviour patterns of these birds it would be more logical to suggest that they came together as a mixed wintering population in a favoured area or at a stopping place on their southward or return migrations of autumn or early spring. At the present day only the barnacle goose is a regular winter visitor to Pembrokeshire although pink footed and the larger white fronted are irregularly recorded (Mathew 1894; Jenkinson and Sutherland 1984; Donovan and Rees 1994).

Signs of butchery give a useful indication of predation by humans but are rarely found on bird bone. Cuts and flensing scrape marks are only normally seen on the larger species or where the bone has acquired a secondary use as an implement or for some other purpose. At Little Hoyle, marks only appear on some fourteen of the goose bones from T5 in the interior of the cave. Most are light cuts on the condyles of the epiphyses or flensing scratches along the shaft of the bone. None of the marks could be associated with secondary use of the bone as tools or instruments. There is also some blackening of a few bones – possibly as a result of fire – and a carpometacarpus of barnacle goose shows parallel cracks that might also be due to fire. Even fewer bones carry indications of mammalian tooth marks and these are mainly of small rodents, although in one case they could be confused with root indentations. No such signs were visible on any of the avian bone from the North Platform.

Estimates of minimum numbers of individual species, though inevitably imprecise, indicate that at least 11 barnacle geese were recovered in the excavation of T5. This is based on a lateral count of right-sided coracoids bones. For other elements, there were only a small number of bones in total of either the left or the right side.

Few sites in the British record are directly comparable in date with this section at Little Hoyle. At the neighbouring cave of Hoyle's Mouth, very few geese were recovered, the wildfowl being mainly mallard, *Anas platyrhyncos*, and shelduck, *Tadorna tadorna*. The Upper Breccia and Silt beds at Pontnewydd Cave, Denbighshire, dated somewhat later, contained bones of both brent and barnacle geese, pink footed and the larger white fronted geese. The long sequence of Upper Palaeolithic occupation at Pinhole Cave, Derbyshire, included pink footed, larger white front, brent and barnacle geese as part of a very mixed avifauna (Bramwell, 1960). Among the finds from the early middle Devensian layer at Soldier's Hole, Somerset a lesser white front was identified (Harrison, 1987). The larger white front was also identified at Kent's Cavern, Devon, and Ightham Fissure, Kent (Harrison, 1980). At La Cotte de St Brelade, Jersey, McBurney's excavations found both pink footed and barnacle geese (Callow and Cornford, 1986).

From other sites in Western Europe there is evidence that even in the final stages of the Devensian the wintering ranges of many species were displaced southwards. All the geese species found at Little Hoyle were recovered at the Grotta Romanelli, Puglia, Italy in a number of Late Glacial layers in which remains of great auk, *Pinguinis impennis*, a sub-arctic pelagic species were also found (Cassoli, 1992). This suggests that there was a distinct displacement of migration patterns and wintering areas for wildfowl and other species during the Late Glacial stages. At the Abri Dufaure, (Landes) in France great northern diver, *Gavia immer* and bewick's swan, *Cygnus Columbianus bewickii*, were found in level 4 dated to around 12,000 BP, indicating a displacement calculated at some 500 kilometres south of their present day wintering grounds (Eastham, 1995).

Anatini

Duck bones were found in units III and IV of excavations in the North Platform. The mallard *Anas platyrhyncos*, is adaptable to a wide range of habitats and is resident throughout the year in Western Europe. The wigeon, *Anas penelope*, is at present a regular winter visitor to Western Britain although there are recent locally breeding populations. The preferred breeding habitat is one of boreal and subarctic vegetation with *Calluna*, heather, and *Pteris*, bracken close to wetland or open water mainly in Fennoscandia and west and central Siberia. They usually arrive at wintering locations October/November and leave from mid-March into April.

Since all species in this assemblage are dependent on vegetable matter for food, the feeding requirements of the wildfowl at Little Hoyle provide a useful guide to the grassland and wetland vegetation of the area at the time. The seasonal migrations and how individual behaviours of the different species on the site overlap suggest that the Ritec valley was a winter haven for geese and ducks during the Late Glacial. The prevalence of mallard, *Anas platyrhyncos*, and shelduck, *Tadorna tadorna*, bones at Hoyle's Mouth provide additional confirmation of extensive wetlands in the locality.

Raptorial species

Sparrowhawk, *Accipter nisus*, kestrel, *Falco tinnunculus* and possible *Halaeetus albicilla*, a white tailed eagle, were the only birds of prey and a single bone of each was recovered from the North Platform excavations. Both sparrowhawk and kestrel are very widespread and represents habitats of light tree cover and scrubland and open grassland. The white tailed eagle is more specialised and the identification is more tentative. This bird was represented by a single claw from Unit II that should give it a date of about 9,980 ± 800 BP. The determination was based on a comparison with recent specimens of white tailed eagle and with bones from the Isbister Neolithic tomb, now in the Tankerness Museum, Kirkwall. It is very much larger than the claws of recent specimens of golden eagle, Aquila chrysaetos. Resident on the west coasts of Norway and Iceland and over large parts of Eastern Europe, the white tailed eagle is no longer found in Scotland or the Northern Isles. However, there are Pleistocene records from different parts of Britain. Bones were recovered from Cathole Cave, Swansea (Harrison, 1980; 1987), Soldiers Hole, Cheddar (Bramwell, 1960), and Clevedon Cave, Somerset (Bell, 1915), Church Hole Cave, Derbyshire (Jenkinson and Sutherland, 1984) and possible Walthamstow, Essex (Northcote, 1980). It is associated with sea coasts but also frequents wooded inland waters and other wetlands where its prey includes fish, birds, mammals and carrion from other species kills. If this identification is correct, it enhances the impression of the Ritec valley as a rich wetland area during the latter part of the Devensian.

Wading species

Wading species are also present in small numbers: the identification of two tarsometatarsii of dunlin, *Calidris alpina*, from McBurney's trench and the 1990 excavations of unit III remains tentative but with the woodcock *Scolopax rusticola* in unit III/IV is further confirmation for local wetland habitat. Passerines, like the pipit, *Anthus spinoletta*, and the willow warbler/chiffchaff, *Phylloscopus* sp., in the same level, similarly haunt the margins of streams and marshes picking up insects and invertebrates.

Game birds

Tetraornidae

The presence of three members of the grouse family in the excavations on the North Platform and further remains of black grouse, *Tetrao tetrax*, in the South Cave supplies useful data for a reconstruction of the avian habitats accessible from the cave. There is a degree of altitudinal and vegetational separation in the niches occupied by ptarmigan, *Lagopus mutus* and willow or red grouse, *Lagopus lagopus (scoticus).* Although not restricted to high altitudes, the ptarmigan favours open hilltops with sparse vegetation and tolerating relatively low temparatures, down to 9ºC. The willow grouse occupies areas of low growing vegetation with heather *Calluna, Vaccinium*, bilberry and other dwarf shrubs. In winter it will descend to lower altitudes to feed on willow, *Salix*, and birch, *Betula*, buds, shoots and catkins. By contrast the black grouse, *Tetrao tetrax*, typically prefers light woodland with open clearings, that provide roost sites and shelter, often in young plantations of broad leaved or coniferous trees but avoiding dense or enclosed areas. At Little Hoyle it is recorded in unit II/III of the North Platform and is the only bird species identified in the South Cave excavations.

Phasianidae

The partridge, *Perdix perdix*, was also found in unit III, IV and VI. It is the most lowland of the galliforms at Little Hoyle at this period.

A similar range of gamebirds are found in a variety of mid to late Devensian and early Holocene contexts throughout the British record: from caves in Somerset, Devon and in Derbyshire as far north as Creag nan Uamh, Sutherland. That the distribution was so extensive suggests that an environment providing the separate niche requirements for each of these galliform species was widespread throughout Britain during succeeding phases of the Last Glacial.

The crane, *Grus grus*, from Edward Laws' excavations may properly be considered with the gamebirds. Its preferred habitat is similar in open grasslands and lowland pastures but also shares with the wading birds a preference for swampy ground for nest and roost sites. Its food is very diverse. It includes a variety of plant material and, opportunistically, animal prey from invertebrates and amphibians to small mammals and birds, Population decline since the 17th century has meant that the crane no longer breeds in Britain but it has recently been re-introduced in East Anglia. Individuals are occasionally driven off course in a westerly direction and arrive in west Wales. Records of chance arrivals in Pembrokeshire have been made since 1893 (Donovan and Rees, 1994, Mathew, 1894).

The only specimen that appears unusual on site is a distal section of humerus of a razorbill, *Alca torda*, (NP684) from the 1986 excavations on the North Platform. As a bird that is pelagic outside the breeding season, when it nests on cliffs and islands, it is difficult to reconcile finding it in what was at the time an inland context. There is the possibility that burrowing mammals have introduced this specimen into its present context.

Passerines

Similar open habitats support the skylark, *Alauda arvensis*, bones of which were more numerous than any other species in the excavations on the North Platform. Other passerines include the thrushes, *Turdus iliacus* and *Turdus merula/torquatus* – it is difficult to distinguish between blackbird and ring ouzel – and chaffinch, goldfinch, hawfinch and yellowhammer; that are all species of mixed vegetation with a preference for seed and fruit bearing grasses, plants, trees and shrubs. Some

development of tree cover may be implied from the presence of woodpigeon, *Columba palumbus*, starling, *Sturnus vulgaris* and carrion crow, *Corvus corone*, but stands may have been limited in extent.

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