

A Medieval Swan-Bone Flute from Abingdon

In 1970 the Abingdon and District Archaeological Society was given permission to investigate a small cellar at the rear of No. 3 Stert Street whilst repair works were being carried on the fifteenth-century timber-framed house.¹ Although the excavation has not been published in detail, available summaries state that just below the cellar floor a substantial rubble stone wall was uncovered, and dated by associated pottery to the fourteenth century.² This wall was thought to have cut into an earlier rubbish pit containing thirteenth-century pottery and a fragmentary bone flute, which is now on display at the Bate Collection in Oxford.³

Until the Reformation this part of the medieval town was owned by Abingdon abbey, and comprised a north–south strip of land bounded by the River Stert (now culverted) to the west and the precinct wall of the abbey to the east. The land had been subdivided into a series of east–west plots with buildings fronting Stert Street, the rents for which provided income for the Benedictine abbey.⁴ Whilst the medieval abbey church, cloister and principal monastic buildings were all demolished after its surrender in 1539, a number the abbey’s ancillary buildings have survived, including the lay servants’ church of St Nicholas and Abbey Gate at the southern end of Stert Street (see Fig. 1).

Permission to investigate the cellar was given by the then owner Jill Ginever, and the excavation carried out on behalf of the Society by the late Ron Henderson. The bone flute was subsequently donated to the Bate Collection, and the site archive curated by the now named Abingdon Area Archaeological and Historical Society.⁵

THE ABINGDON BONE FLUTE

Following its discovery, the bone flute fragments were cleaned and reconstructed by the Society (Fig. 2), and although missing some large areas of bone – below the window, on the back of the pipe, and the foot of the pipe below the first finger hole – the majority of the instrument survives. The Bate Collection inventory identifies it as a ‘deer bone whistle with two finger-holes’. However, closer examination reveals that the thickness of the bone wall, relative to its length and diameter, is too thin for the long bone of a deer or other large mammal, and more consistent with that of larger birds and waterfowl. Furthermore, whilst two complete finger holes can be seen on the body of the flute, the remains of an additional finger hole (noted in the Society’s 1971 site summary) can be observed in the fracture line at the lower end of the shaft.

Having narrowed down the flute material to avian wing bone, the closest match is the right humerus of an adult mute swan (*Cygnus olor*). Resident mute swan populations have existed for many centuries if not thousands of years on the River Thames and its tributaries, which before being culverted would have included the River Stert. There is an early sixteenth-century

¹ OS Grid Reference SU 49832 97103; Grade II Listed Building, Number 1283172. The author is grateful to the editor and Roger Thomas (on behalf of the Abingdon Area Archaeological and Historical Society) for their kind help and advice in the preparation this note.

² Abingdon and District Archaeological Society, ‘Abingdon, Berkshire’, *CBA Group 9 Newsletter*, 1 (February 1971), p. 21.

³ Oxford, Bate Collection, inventory number 0406.

⁴ R.M. Thomas, ‘Monastic Town Planning at Abingdon’, *Oxoniensia*, 75 (2010), pp. 51–3; R.E.G. Kirk (ed.), *Accounts of the Obedientiars of Abingdon Abbey*, Camden Society (1892), pp. 51–2.

⁵ R.M. Thomas, ‘Chairman’s Report’, *Abingdon Area Archaeological and Historical Society Newsletter* (Autumn 2011), pp. 2–3; A. Smithson, ‘The Bate Collection’, *Abingdon Area Archaeological and Historical Society Newsletter* (Autumn 2013), p. 6.

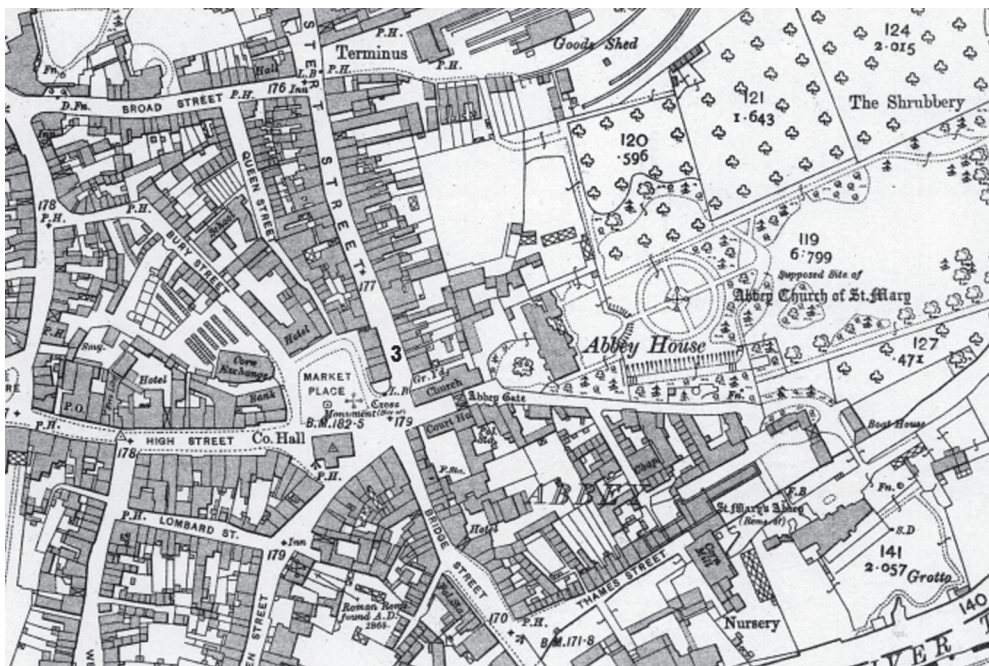


Fig. 1. Abingdon town centre with the two properties now forming No. 3 Stert Street located to the east of the large numeral at the southern end of the street. OS Map 1:2500 County Series (1912).

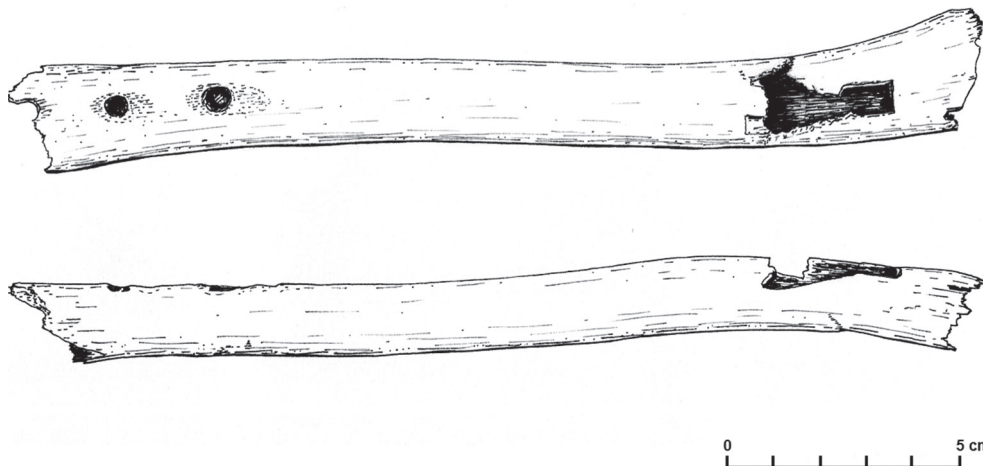


Fig. 2. Plan and side views of the Abingdon swan-humerus flute. Drawing thought to have been produced by the late Edna Henderson and provided courtesy of the Abingdon Area Archaeological and Historical Society.

Table 1. Abingdon bone flute, principal dimensions to the nearest 0.05 cm

Surviving tube length	20.50 cm	Top of window to tone hole A centre	18.25 cm
Windway length	1.85 cm	Top of window to tone hole B centre	16.25 cm
Window height	0.95 cm	Top of window to tone hole C centre	14.20 cm
Window width	0.60 cm	Tone hole A diameter (incomplete)	0.50 cm
Tube wall thickness	≈ 0.15 cm	Tone hole B diameter	0.50 cm
Tube end diameter	≈ 1.70 cm	Tone hole C diameter	0.50 cm

record of birds breeding on the islands in the Thames being taken by the abbot's servant for the monastery's supplies.⁶ The other possible species is the whooper swan (*Cygnus cygnus*), although this is less likely given they are migratory winter visitors from Iceland and tend to be found in estuaries and wetland areas, rather than on rivers and lakes.

The swan humerus had clearly been modified to make a simple whistle or duct flute, with a window at one end and three circular tone holes at the other (see Table 1 for dimensions). The defining feature of a duct flute is its mouthpiece where the tube is partly closed by a plug conventionally termed the block or fipple, leaving a narrow duct (wind-way), through which the player's breath is directed across the window (voicing hole) towards the opposing sharp edge known as the lip. This sets up vibrations called edge tones, which are then transmitted to the air column in the tube producing an audible standing wave. The distance from the top of the window to the foot (open end) of the flute is known as the sounding length, and is the principal factor in determining the fundamental pitch or frequency of the instrument. Opening the tone holes (by releasing the fingers) effectively shortens the length of the air column (and thereby raises the frequency), so the player is able to produce a discreet scale of musical tones.

The flute maker's first task would have been to remove the two articular ends (*epiphyses*) of the humerus to reveal the hollow shaft, which is a property of avian wing bone and that lends itself to flute making. The window and fingers holes are all located along the same face (anconal aspect) of the right humerus, as if viewed from above when the wing is extended in flight. The window, which is characteristic of duct flutes, was formed by cutting what may appear to be a rectangular shaped opening at the distal (elbow) end of the bone. Sadly, most of its lower edged or lip is missing, but what remains is slightly curved suggesting more of an elongated 'D'-shaped window. At the proximal (shoulder) end of the bone three circular tone holes were cut, most likely by rotating a tapered blade such as a knife point or awl.

BONE FLUTES IN BRITAIN

Bone pipes of various dates have been found on archaeological sites in Britain, including possible Neolithic and Bronze-Age examples, but the vast majority date to the medieval period, from which over a hundred examples are recorded in England.⁷ These pipes are almost exclusively of the duct flute type, like the modern recorder and penny whistle, and although many are broken or fragmentary about a third are complete.⁸ A sheep tibia flute from Malham in the Yorkshire

⁶ J. Steane, 'The Abingdon Monks' Map', *Oxoniensia*, 73 (2008), p. 19; Berkshire Record Office, D/EPT/87, 47.

⁷ J.V.S. Megaw, 'Penny Whistles and Prehistory', *Antiquity*, 34 (1960), pp. 6–13; S. Wyatt, 'Soul Music: Instruments in an Animistic Age', in S. Banfield, ed., *The Sounds of Stonehenge*, BAR BS, 504 (2009), pp. 11–16.

⁸ J.V.S. Megaw, 'An End Blown Flute from Medieval Canterbury', *MedArch*, 12 (1969), pp. 149–50; idem, 'The Bone Pipe', in C. Platt and R. Coleman-Smith, *Excavations in Medieval Southampton*, vol. 2 (1975), pp. 252–3; idem, 'Bone Musical Instruments from Medieval Exeter', in J. Allan, *Medieval and Post-Medieval Finds from*

Dales, previously said to be Iron Age in date, is now thought to be the first example found in an Anglo-Saxon burial context.⁹ In 1973 a further bone flute fragment (length 4.5 cm) was discovered in Abingdon, with evidence of at least three tone holes, but missing its mouthpiece.¹⁰

The work of Helen Leaf has confirmed that the most commonly used materials for English medieval bone flutes were goose ulna and sheep tibia, but include examples made from swan, crane and deer bone (see Table 2).¹¹ All of these animals were potential food sources with goose and sheep being more widely available than swan and deer, which are thought to be elite diet indicators. Mute swan have been crown property since at least the twelfth century, with ownership granted to some high-ranking individuals and establishments, and were kept as a semi-domesticated birds in swanneries associated with royal and aristocratic residences and religious houses.¹² Archaeological evidence appears to confirm their prestige value with swan remains predominantly found on such sites until the mid fourteenth century, when they are increasingly found in towns and cities – appearing to coincide with the growing wealth of the urban elite.¹³ This change in consumption may be reflected in Abingdon, where excavations at Nos. 38–44 Stert Street yielded fourteen swan bone fragments from fifteenth- to sixteenth-century contexts, but none from any of the earlier deposits.¹⁴ Conversely, we find that of the (now) nine medieval swan-bone flutes found in England, two are from castle sites and seven from urban domestic sites, yet these finds are all thought to be pre-fourteenth century.¹⁵ It is perhaps the selective retrieval of waste swan bone (eight ulnae and one humerus) from high-status sites, and its reuse to make a relatively low-status yet highly portable musical instrument, that could account for this more urban and domestic pattern of deposition.

The vast majority of bone flutes are relatively basic in construction, with a simple ‘D’-shaped window and three to four tone holes.¹⁶ These flutes can be easily made with just a pointed knife, which would tend to favour a domestic origin. However, a small number of more complex multi-hole deer bone flutes, including examples from White Castle in Monmouthshire and Keynsham abbey in Somerset, exhibit a higher level of bone-working.¹⁷ These flutes have an

Exeter, Exeter Archaeological Reports, vol. 3 (1984), pp. 349–51; idem, ‘Bone Whistles and Related Objects’, in M. Biddle, *Objects and Economy in Medieval Winchester*, vol. 2 (1990), pp. 718–23; G. Lawson, ‘Note on the Musical Instrument’, in J.G. Coad and A.D.F. Streeten, ‘Excavations at Castle Acre Castle, Norfolk, 1972–1977’, *Archaeological Journal*, 139 (1982), pp. 252–4; idem, ‘Flutes’, in A. Rogerson and C. Dallas, *Excavations in Thetford 1948–1959 and 1973–1980*, East Anglian Archaeology Report, 22 (1984), pp. 182–3; idem, ‘Bone Flute’, in S. Margeson, *Medieval and Post Medieval Finds from Norwich Survey Excavations 1972–1977*, East Anglian Archaeology Report, 58 (1993), pp. 211–12; idem, ‘Bone Flutes’, in C. Dallas, *Excavations in Thetford 1964–1970*, East Anglian Archaeology Report, 62 (1993), pp. 159–60, 163; idem, ‘Flute’, in P. Andrews, *Excavations at Redcastle Furze, Thetford 1988–1999*, East Anglian Archaeology Report, 72 (1995), pp. 116, 118 (and microfiche I: D1–D6); A. MacGregor, *Bone, Antler, Ivory and Horn: The Technology of Skeletal Materials Since the Roman Period* (1985), pp. 148–51.

⁹ A. Raistrick et al., ‘The Malham Iron Age Pipe’, *Galpin Society Journal*, 5 (1952), pp. 28–38; R. Sermon and J.F.J. Todd, ‘The Malham Pipe: A Reassessment of its Context, Dating and Significance’, *Northern History*, 55.1 (2018), pp. 5–43.

¹⁰ M. Parrington and C. Balkwill, ‘Excavations at Broad Street, Abingdon’, *Oxoniensia*, 40 (1975), pp. 47–8, fig. 37 no. 15. The author is grateful to Roger Thomas for bringing this unstratified flute to his attention.

¹¹ H. Leaf, ‘English Medieval Bone Flutes: A Brief Introduction’, *Galpin Society Journal*, 59 (2006), pp. 13–19; idem, ‘English Medieval Bone Flutes, c.450–c.1550 AD’, University College London Ph.D. thesis (2008).

¹² Idem, ‘English Medieval Bone Flutes, c.450–c.1550 AD’, pp. 66, 179; N.F. Ticehurst, *The Mute Swan in England: Its History, and the Ancient Custom of Swan Keeping* (1957), pp. 6, 10.

¹³ Leaf, ‘English Medieval Bone Flutes, c.450–c.1550 AD’, p. 68; N. Sykes, ‘The Dynamics of Status Symbols: Wildfowl Exploitation in England AD 410–1550’, *Archaeological Journal*, 161 (2004), pp. 91–3.

¹⁴ M. Parrington, ‘Excavations at Stert Street, Abingdon, Oxon’, *Oxoniensia*, 44 (1979), pp. 20–1.

¹⁵ Leaf, ‘English Medieval Bone Flutes, c.450–c.1550 AD’, pp. 180–1 (Queen Street, Exeter; St George’s Street, Ipswich; Lower Thames Street, London; Ludgershall Castle, Wiltshire; Old Sarum, Wiltshire; Bishopsgate, Norwich; Clifford Street, York; Coppergate, York).

¹⁶ *Ibid.* p. 163.

¹⁷ J.V.S. Megaw, ‘An End Blown Flute or Flageolet from White Castle, Monmouthshire’, *MedArch*, 5 (1961), pp. 176–80; idem, ‘A Medieval Bone Pipe from White Castle, Monmouthshire’, *Galpin Society Journal*, 16 (1963),

Table 2. Materials used for English medieval bone flutes

Skeletal Material	Examples	Percentage	Skeletal Material	Examples	Percentage
Goose ulna	36	30.5%	Crane tarsometatarsus	3	2.5%
Goose humerus	4	3.4%	Sheep tibia	31	26.3%
Goose tibiotarsus	2	1.7%	Sheep metatarsus	5	4.2%
Swan ulna	8	6.8%	Sheep femur	1	0.8%
Swan/Crane ulna	1	0.8%	Deer tibia	4	3.4%
Crane ulna	4	3.4%	Deer metatarsus	5	4.2%
Crane tibiotarsus	4	3.4%	Unspecified bones	10	8.5%

Source: Leaf, 'English Medieval Bone Flutes, c.450–c.1550 AD', tables 38 and 53.

elaborate square or rectangular shaped window and ramp, requiring a range of specialist tools for their manufacture such as saws, awls and files.

The blocks or fipples do not generally survive in the archaeological record, having either been lost or decayed. Suggested materials have included wood, clay, beeswax or a resinous paste.¹⁸ The use of wood is favoured by Leaf but is time consuming to shape and requires a wax or resin to hold the fipple in place; clay was suggested as an alternative by Megaw but shrinks on drying and is liable to drop out, whereas beeswax can be easily moulded to the irregular internal shape of bone and provides a good airtight seal. Ethnographic examples from South America include bone flutes with wax blocks, which may support the suggestion of beeswax or a similar pliable material in European examples.¹⁹

It was previously thought that the musical scales and intervals produced by different bone flutes might aid an understanding of medieval vernacular tonality, but today such approximations are considered imprecise and rather outmoded, no longer reflecting modern research methods or agenda.²⁰ Nevertheless, at least four fundamental tones would have been available on the Abingdon bone flute, by blowing gently into the mouthpiece with all three tone holes closed, and then successively opening each tone holes from bottom to top. This basic scale may have been augmented with additional tones produced by: (a) using different combinations of open and closed tone holes, (b) partially covering the some of the tone holes, and (b) blowing harder to obtain their various harmonic over-tones. Thus, what is essentially a very simple instrument, playable with just one hand, can produce a surprisingly wide range of musical notes. This has prompted an ongoing debate as to whether these bones flutes provide a possible origin for the three-hole pipe and tabor (drum).²¹

pp. 85–94; J.H. Barrett, 'A Fipple Flute or Pipe from the Site of Keynsham Abbey', *Galpin Society Journal*, 22 (1969), pp. 47–50.

¹⁸ Megaw, 'Flageolet from White Castle', p. 177; Leaf, 'English Medieval Bone Flutes: A Brief Introduction', p. 16.

¹⁹ Pitt Rivers Museum, accession numbers: PRM.1931.13.1 and PRM.1938.34.279.

²⁰ G. Lawson, 'Getting to Grips with Music's Prehistory: Experimental Approaches to Function, Design and Operational Wear in Excavated Musical Instruments', in A. Harding (ed.), *Experiment and Design: Archaeological Studies in Honour of John Coles* (1999), pp. 133–8; idem, 'Music, Intentionality and Tradition: Identifying Purpose, and Continuity of Purpose, in the Music-Archaeological Record', in E. Hickmann and R. Eichmann (eds.), *Studien zur Musikarchäologie*, IV (2004), pp. 61–97.

²¹ Sermon and Todd, 'The Malham Pipe', pp. 32–3.

CONCLUSIONS

The Abingdon bone flute, with its three distally grouped finger holes and a 'D'-shaped window, conforms to a pattern seen in other medieval examples found in Britain. However, it is the first such flute known to have been made of swan humerus and thus fills a gap in the artefact typology.²² Swan bone is normally a high-status diet indicator, so its use in a relatively low-status musical instrument is of interest. Was it obtained as waste material from the kitchens of the neighbouring Benedictine abbey to the east of the find site, or possibly washed up dead or taken illegally from the River Stert immediately to the west? Those are just two of many possible scenarios, but it almost certainly derived locally from the resident mute swan populations living on the River Thames and its tributaries. Found broken and discarded in a thirteenth-century domestic rubbish pit, the reconstructed flute is one of those personal items that we can immediately recognise and relate to its modern equivalents (the recorder and penny whistle), and thus provides tangible connection with everyday life in medieval Abingdon.

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²² Leaf, 'English Medieval Bone Flutes, c.450–c.1550 AD', p. 83.