

# An End-Blown Flute or Flageolet from White Castle

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AMONGST the finds from the clearance by H.M. Office of Works of White Castle, Monmouthshire, at the end of the 1920s was a bone pipe. The pottery was published in 1935<sup>1</sup> but the pipe seems to have remained unnoticed. My attention was drawn to it by Mr. J. G. Hurst, who saw it in the National Museum of Wales<sup>2</sup> when he was examining the pottery afresh in the light of the new historical evidence for the dating of the castle.<sup>3</sup> The official records state that the pipe was found 'at the bottom of the moat' on 15 October, 1929. There are two versions of the finds list giving the position in the moat as (a) 'north end mound' and (b) 'north end of F tower', but the second seems the more accurate since it appears thus in the original manuscript countersigned by Sir Charles Peers (then Chief Inspector of Ancient Monuments) and Mr. C. A. R. Radford (then Inspector of Ancient Monuments for Wales). It is difficult to assign either description to a definite part of the moat, but there seems little doubt it was found at the bottom with the bulk of the pottery. If Mr. Hurst's reassessment of the pottery<sup>4</sup> is correct, this suggests that the pipe should belong to the second half of the thirteenth century.

## DESCRIPTION (PL. XXIX, A-C)<sup>5</sup>

The tube has been cut from a cannon bone of a thickness which allowed considerable working of the bone's original contours.<sup>6</sup> It is 19 cm. long, slightly belling out on both axes at top and bottom. Externally it is 2 cm. across by 2·2 cm. square at the head and 1·8 cm. at the foot; internally, where the bone has been roughly cleaned out, it is 1·4 by 1·6 cm. at the head and 1·6 by 1·4 cm. at the foot. The thickness of the tube averages 0·25 cm. while at the first finger-

<sup>1</sup> B. H. St. J. O'Neil in *Antiq. J.*, xv (1935), 330-5.

<sup>2</sup> Reg. No. 32-429/12.

<sup>3</sup> A. J. Taylor *supra*, pp. 169 ff.

<sup>4</sup> He believes (see his forthcoming report in *Med. Archaeol.*, vi), that most of the pottery (especially that from the moat) is after 1250. This is supported by Taylor's new historical evidence. I am much obliged to Mr. Hurst for providing this information about the dating of the pipe and for bringing it to my notice, and to the National Museum of Wales for lending it for study, and for permission to publish it.

<sup>5</sup> A somewhat fuller discussion of this piece will appear in a forthcoming number of the *Galpin Society Journal*. The excellent photographs (pl. xxix, A-C) are by Mrs. V. M. Conlan of the Institute of Archaeology, University of London.

<sup>6</sup> Dr. I. W. Cornwall has kindly examined the bone and, so far as the extensive carving of exterior and interior surfaces permits identification, suggests it is the metapodial of the red deer (*Cervus elaphus*) and more probably the metatarsal. This is the only example of the use of such a bone, doubtless dictated by the size of instrument required; compare pl. xxix, B, C.

hole the tube is 1.4 by 1.5 cm. internally.<sup>7</sup> The outer surface has been considerably cut and smoothed off to give an approximately square cross-section; the rear and presumably dorsal surface, which has been particularly flattened, dips longitudinally towards the head. The front of the tube has a rectangular opening with a finely cut ledge forming the voicing lip. The opening measures 0.5 by 0.8 cm., the cut for the ledge sloping into the bone from about 5 cm. from the mouth of the tube to the actual, but now much damaged, lip which is a mere 0.05 cm. thick (PL. XXIX, A). There are in addition five finger-holes, here numbered (from the top) 1-5. These are only approximately circular and the lack of any countersinking suggests that they were at least finished off with a knife rather than simply drilled out. Hole 1 begins 4.65 cm. from the lip. Thereafter the distances between the holes are, respectively, 1.5, 1.1, 1.1, and 1.3 cm. and their diameters are *c.* 0.75, 0.8, 0.8, 0.8, and 0.9 cm. A fragment *c.* 1.5 by 0.3 cm. is missing from between nos. 1 and 2. The rear surface has an upper and lower thumb-hole (here designated T1 and T2), T1 being placed above the position of no. 1, 6 cm. from the top, T2 some 5.6 cm. further down roughly half way between nos. 3 and 4. Both thumb-holes are oval, 0.75 by 0.63 and 0.7 by 0.6 cm. respectively. At 0.5 cm. from the foot there is a small hole tapering from 0.3 on the outer surface to 0.2 cm.; below this is a roughly cut notch. Cuts and abrasions can be seen over the whole surface of the bone, the front and sides of which are covered with 235 circular pockings varying from 0.15 to 0.3 cm. in diameter. None of these quite pierces the thickness of the bone. Basically the holes form a triple row on the front and double rows on the sides. About 4 cm. down the right side however the pattern is irregularly broken and one can but idly speculate whether this is an owner's mark or a mere doodle—certainly no actual letters seem to be represented (PL. XXIX, A). On this side the lower row of hollows is incomplete, the last impression, 0.09 cm. in diameter, suggesting again the use of a knife.

#### GENERAL DISCUSSION

Clearly the White Castle bone is an end-blown flute or flageolet minus the block which must have originally been inserted at the top to direct the player's breath against the knife edge. Such bone pipes have an extremely lengthy history in Europe<sup>8</sup> and bone tubes with provision for finger-holes are found as early as the Aurignacian and still occur in certain parts of the world today.<sup>9</sup> The block is invariably absent, suggesting that it was usually made of clay or wood. However, with its careful finish and construction, which are unique in my experience, our pipe suggests more than a simple shepherd's instrument. The decoration is typical 'folk' art as found not only on other medieval

<sup>7</sup> Owing to the considerable cracking of the bone all lateral measurements are probably up to 0.1 cm. in excess of the original dimensions.

<sup>8</sup> See (a) my article in *Antiquity*, xxxiv (1960), 6-13, and (b) further notes in *Antiquity*, xxxv (1961), 55-57; add now, for instruments of the Hallstatt period in Austria, O. Seewald in *Oberösterreichischen Heimatblättern*, xiv (1960), 181-7.

<sup>9</sup> *Antiquity*, xxxv (1961), pl. vii shows a modern Cretan example.

bone objects but on a modern wooden Jugoslavian pipe in my possession, also of square cross-section. Of earlier examples the well-known bone from Hammeren, Bornholm, has crude scratch-and-dot ornament.<sup>10</sup> A twelfth(?) century bone pipe from Wartburg, Eisenach, with three finger-holes, a thumb-hole and well-cut voicing lip, has grouped-dot ornamentation on its front.<sup>11</sup> An additional refinement on the White Castle pipe is the manner in which holes 2, 3, T1 and T2 angle back towards the top of the tube to assist the natural fall of the fingers.

There are a few other bone pipes from Britain of the twelfth and thirteenth centuries, but none are more than the simplest of whistles probably to be played with one hand in the manner of the pipe and tabor.<sup>12</sup> Scandinavian examples of the medieval period also tend to be simple, although one pipe from Old Kalmar, Sweden, has four large finger-holes flanked at each end by a smaller hole.<sup>13</sup>

The general appearance of the White Castle example is only surpassed by those strange objects of Roman date turned, carved, drilled out, and cut, found in several parts of Britain and on the continent, for which various unsatisfactory explanations have been offered.<sup>14</sup> However there is no such doubt involved here.

The choice of five finger-holes instead of six and the placing of the thumb-holes is perhaps odd in comparison with more recent instruments, but by analogy with the earlier bone pipes from the Dutch *terpen*—the largest contemporary dated series I have so far noted—the length of the tube and the corresponding fall of the hand(s) seems often to have dictated the number of holes, and this may be true of the White Castle pipe. In addition, several of the Dutch pipes have on the under surface a small hole near the foot, like that below T2, which seems most likely to be for suspension. The nineteenth-century pipe from Paarup, Viborg, strangely enough, bears just such a ‘suspension hole’ at the opposite, i.e. the mouthpiece, end.<sup>15</sup>

Turning to the general field of medieval wind instruments, our piece (if we may rely on the late thirteenth century dating for it, p. 176) follows on from a period when, though choral singing was already well established, panpipes, the fingered cow-horn and horn-pipe were all that the greatness of the Normans could produce, apart from the organ.<sup>16</sup> Incidentally, the horn-pipe, the Anglo-Saxon *swegel horn* (‘shin-bone and horn’), is the ancestor of the Welsh *pibgorn*,

<sup>10</sup> For this piece and its medieval date see S. Vestergaard Nielsen in *Kuml*: 1951, pp. 145-53; see also p. 180 below.

<sup>11</sup> H. Moeck in *Svensk Tidskrift för Musikforskning*: 1954 (1955), pp. 61-62, fig. 2.

<sup>12</sup> Lydney Castle, *Antiq. J.*, xi (1931), 254 and pl. xxxvi, 2; Castle Hill, Folkestone, *Archaeologia*, XLVII (1883), 464 and pl. xx, 35; Rayleigh Castle, Essex, *Trans. Essex Arch. Soc.*, n.s. xii (1913), 170, fig. 5, no. 5; Bungay Castle, *Proc. Suffolk Inst. of Arch.*, xxii (1936), 334; Old Sarum, *Proc. Soc. Antiq. Lond.*, xxiii (1909-11), 515—the last refers to two published as Roman.

<sup>13</sup> In the Nordiska Museet, Stockholm; Moeck, *op. cit.* in note 11, pp. 62-63, fig. 6, where other northern pipes are cited. See also Megaw, *op. cit.* (a) in note 8, p. 11 and Vestergaard Nielsen, *op. cit.* in note 10, pp. 148-51.

<sup>14</sup> Megaw, *op. cit.* (b) in note 8, pp. 56-57; the ‘hinge’ myth seems to have been given an early airing by F. W. Reader in *Essex Naturalist*, xvi (1910), 37.

<sup>15</sup> Vestergaard Nielsen, *op. cit.* in note 10, pp. 148-9, fig. 6.

<sup>16</sup> Anthony Baines, *Woodwind Instruments and their History* (1957), pp. 209 ff.

three eighteenth-century examples of which are in the Welsh Folk Museum.<sup>17</sup> However, from the succeeding period of *Arts Antiqua* we have rather more information in the form of textual references and illustrations.<sup>18</sup> No actual instruments survive—apart from our pipe and its cousins already quoted. The true conical bored recorder is not known before the sixteenth century,<sup>19</sup> but the basic form with seven holes and cut-away 'bec' occurs from the fourteenth century onwards.

#### THE MUSIC OF THE PIPE<sup>20</sup>

After a preliminary examination of the pipe and its historical importance, it was decided to try to repair the cracks in the bone and to assess its musical range. Owing to the dry and fragile nature of the bone I followed the only published attempt at such restoration, the iron-age example from Malham Tarn, W. Riding,<sup>21</sup> and restored the knife edge, cracks, and block or fipple in plasticine. This proved a fairly simple task, although the knife edge required renewal several times during the subsequent experiments and did not allow of the blowing of satisfactory harmonics. It is unlikely that the resultant notes produced orally, though pure in tone, correspond exactly with those made when the pipe was in its original state, but it is equally unlikely that they differ in relative pitch. Calibration against tuning forks resulted in the following scales:<sup>22</sup>

- (i) employing both T<sub>1</sub> and T<sub>2</sub>; b<sup>''</sup>, c<sup>'''</sup>, c<sup>b'''</sup>, f<sup>'''</sup>, g<sup>'''</sup>, b<sup>b'''</sup>
- (ii) without T<sub>1</sub>; f<sup>'''</sup>, g<sup>'''</sup>, a<sup>'''</sup>, b<sup>b'''</sup>, c<sup>''''</sup>, d<sup>''''</sup>

It was established that 1, 2, 3 + T<sub>2</sub> could be employed to give the same value as 1, 2, 3, 4 on either scale; the small hole below T<sub>2</sub> had no discernible effect on pitch, and this seems to support the view that it was a suspension-hole.

The fact that two such series can be produced is a remarkable acoustical phenomenon; the interval between the two series would superficially suggest playing on the harmonics of the octave and the twelfth as with the pipe and

<sup>17</sup> Information from Mr. F. G. Payne; for a west-country example of 1372 see Baines, *Bagpipes*, Pitt Rivers Museum, Occ. Papers, 9 (1960), p. 59, fig. 31: it has been remarked in all seriousness that the distribution of the horn-pipe corresponds with that of the megalithic tombs! The wooden 'flute' of tenth/eleventh-century date from the Anglo-Danish levels of the Hungate, York, and its *terpen* analogies noted by K. M. Richardson in *Archaeol. J.*, LXVI (1959), 63, 85, fig. 19, no. 20, have the same ridging between the finger-holes and provision for a separate mouthpiece as on one of the Cardiff *pihgorns*. The bellowing out of the Hungate instrument also suggests a reed pipe; if this really is so it is unique for the period.

<sup>18</sup> For simple flagcolets or pipes, though, only the fourteenth-century *Grosse Heidelberger Liederhandschrift* or Manasse MS. in Heidelberg University Library and M. Agricola, *Musica Instrumentalis* (1528), seem to illustrate bone instruments of the White Castle type; double pipes are rather more common and an eleventh-century example occurs in Bibliothèque Nationale MS. Lat. 1118.

<sup>19</sup> The earliest English example is probably the sixteenth-century double recorder from the walls of Christ Church, Oxford, now the property of the Warden and Fellows of All Souls and displayed in the Galpin Society's 1951 Exhibition of British Musical Instruments; in general see Baines, *Woodwind Instruments*, pp. 234-42. A bone 'recorder' (but with four instead of seven finger-holes) is to be seen in a painting by J. A. Backer (1608-51) at the Fries Museum, Leeuwarden. This example is to be added to I. F. Finlay's article on musical instruments in seventeenth-century Dutch painting in *Galpin Soc. J.*, VI (1953), 52-69. See also V. Denis, *De Muziekinstrumenten in de Nederlanden en in Italië naar hun Afbeelding in de 15-ee. Kunst* (1944), a summary of which appears in *Galpin Soc. J.*, II (1949), 32-46.

<sup>20</sup> I am indebted to Mr. and Mrs. James MacGillivray for much help in this section.

<sup>21</sup> Eric Todd in *Galpin Soc. J.*, V (1952), 34-38.

<sup>22</sup> The actual notes produced varied by less than a quarter tone from the printed values here given; c' = middle C, a' = 440 c.p.s.

tabor, the traditional accompaniment of the medieval *jongleur*.<sup>23</sup> However, the unlikelihood of not employing F1, and the relationship of the pitch to the length of tube, both argue strongly for the lower series of notes being the fundamentals. That the scales are clearly diatonic, the lower giving the key of B♭ minus the leading note, A—which, however, can be obtained by cross-fingering in the manner of normal recorder playing—should not cause surprise; Welsh harp music, subject to official regulation by the twelfth century, was neither modal nor unharmonized.<sup>24</sup> A model of the Bornholm notched pipe showed this instrument also to be capable of a diatonic scale: e''' f''' g''' a''' c#'''' e''''<sup>25</sup>—a feature which makes its lack of precise dating all the more unfortunate. The range of our pipe would have been ample to accompany the *langue d'oïl* 'chansons de geste' and lesser lyrics of the twelfth- and thirteenth-century *trouvères* of central and northern France,<sup>26</sup> who would have introduced their art into Britain under the Angevin empire.<sup>27</sup> The compass of the melodies of several contemporary musicians whose work has survived—Richard I (1157-99) amongst them—rarely exceeds a sixth.<sup>28</sup> If these should seem a far cry from Monmouthshire, there is, as evidence for the widespread popularity of secular music, the account<sup>29</sup> of how when Earl Ranulf of Chester was besieged in 1212 by the Welsh at Rhuddlan, Roger de Lacy gathered such a crowd of jongleurs together that the mere sight of their numbers frightened off the attackers. Indeed our White Castle pipe, before being so ignominiously relegated to the moat, would have been well-fitted either to accompany the tales of the *Mabinogi* or the tragic history of Tristan and Isolde—Tristan who himself played on the *flageol*.<sup>30</sup> Fancy apart, the White Castle instrument is a most important addition to the organology of the medieval period.

<sup>23</sup> The pipe is the *galoubet* of the south; for an illustration of our period see that invaluable source, the Escorial Library 3rd Codex of *Cantigas de Santa Maria* by Alfonso el Sabio of Leon and Castile (1254-84).

<sup>24</sup> Eric Blom, *Music in England* (1947), pp. 18-19.

<sup>25</sup> H. T. Rützebeck, *Fra Musikkens Urtid* (1936), pp. 66-67.

<sup>26</sup> J. A. Westrup in *New Oxford History of Music*, II (1954), 220-8.

<sup>27</sup> One may also note that the 'loi', a lyric form of possible Celtic origin and a term occasionally applied to instrumental music, occurs with an English translation in the Guildhall Library *Liber de Antiquis Legibus* f. 160 verso.

<sup>28</sup> Compare the examples given by A. T. Davison and W. Apel, *Historical Anthology of Music*, I (1954), nos. 18-19.

<sup>29</sup> Recounted by Percy A. Scholes. *Oxford Companion to Music*, 9th ed. (1955), article 'Minstrels, etc.', § 2, p. 647. The source of the story is an early MS. *Historia Lacieorum* printed in Sir William Dugdale, *Monasticon Anglicanum*, v (1846), 533-4; the crowd actually comprised 'sutores et histriones'. I am indebted to my colleague Dr. R. I. Jack for this reference.

<sup>30</sup> See Baines, *Woodwind Instruments*, p. 222. Yet a main source for the story, Gotfrid von Strassburg (*ca.* 1210), omits mention of the instrument: Finlay in *Galpin Soc. J.*, v (1952), 39-43.