

## LONG CIST BURIALS AT KINGOODIE, LONGFORGAN, PERTSHIRE

by D. B. TAYLOR, M.A., F.S.A.SCOT.

THE eastern boundary of the Carse of Gowrie is a crescent-shaped outcrop of Lower Old Red Sandstone extending from Kingoodie, on the estuary of the Tay, to the village of Longforgan some two miles to the north-west. The ridge forms a westerly extension of the sedimentary rocks of Angus. It reaches the river in a headland with cliffs from 30 to 50 feet high, thus contrasting with the low-lying river banks to the east and west. The base of this headland forms the site of the village and quarries of Kingoodie.<sup>1</sup>

The name Kingoodie is of considerable antiquity. Malcolm IV (1153-65) confirmed to the Priory of St Andrews an earlier grant of that half ploughgate of land in the shire of Forgan, called *Chingothie*.<sup>2</sup> The first reference to the village, however, seems to be contained in the Statistical Account.<sup>3</sup> It might be assumed that the advantages of ground above the general level of the Carse with lighter soils, better natural drainage and easy access to the river would have proved attractive to early settlers but, until recently, no such evidence has been forthcoming. Around nearby Invergowrie, a number of short cists and at least two long cists have been recorded<sup>4</sup>; F. T. Wainwright described a souterrain found in Longforgan village<sup>5</sup>; to date, there has been no evidence of early settlement from the immediate vicinity of Kingoodie itself.

On the crest of the headland, overlooking Kingoodie and immediately to the east of the quarries, stood a row of late eighteenth-century cottages, built of local stone and clay and known as Brachead. These have now been demolished and the site occupied by two modern houses. The most westerly, called Sillerton, is owned and occupied by Mr D. M. G. Main.

### DISCOVERY

The gardens of the old cottages had become overgrown and the process of reclamation involved the removal and riddling of the top spit of soil. At the beginning of June 1956, in that part of the garden overlooking the Perth-Dundee railway and Kingoodie House, Mr Main came upon a number of slabs set on edge. He regarded these as, perhaps, part of an old type of field drain and removed them. This discovery was followed by that of a second and yet a third series of slabs in a similar position. On removing the last of these, Mr Main brought to the surface a few fragments of a human skull and thereupon realised the significance of his discovery. He contacted the local police who informed me of the situation. I visited the site and arranged for the excavation of what had obviously been a small cemetery.

<sup>1</sup> Most of the old houses of the village have now been demolished to make way for a new housing scheme.

<sup>2</sup> *Liber Cartarum Prioratus Sancti Andree in Scotia*, Bannatyne Club (1841), 205.

<sup>3</sup> *Stat. Acc.*, XIX (1797), 464.

<sup>4</sup> *P.S.A.S.*, VI (1866-7), 216, 394. XXII (1887-8), 167.

<sup>5</sup> *P.S.A.S.*, LXXXVIII (1954-6), 57.

The burials turned out to be extended inhumations and it seemed likely that others might remain as yet undiscovered on the site. Mr Main agreed to keep this in mind during future operations and in due course, he reported a fourth burial at the beginning of June 1958. This cist was undisturbed, the cover slabs remaining intact, and so a complete excavation was possible.

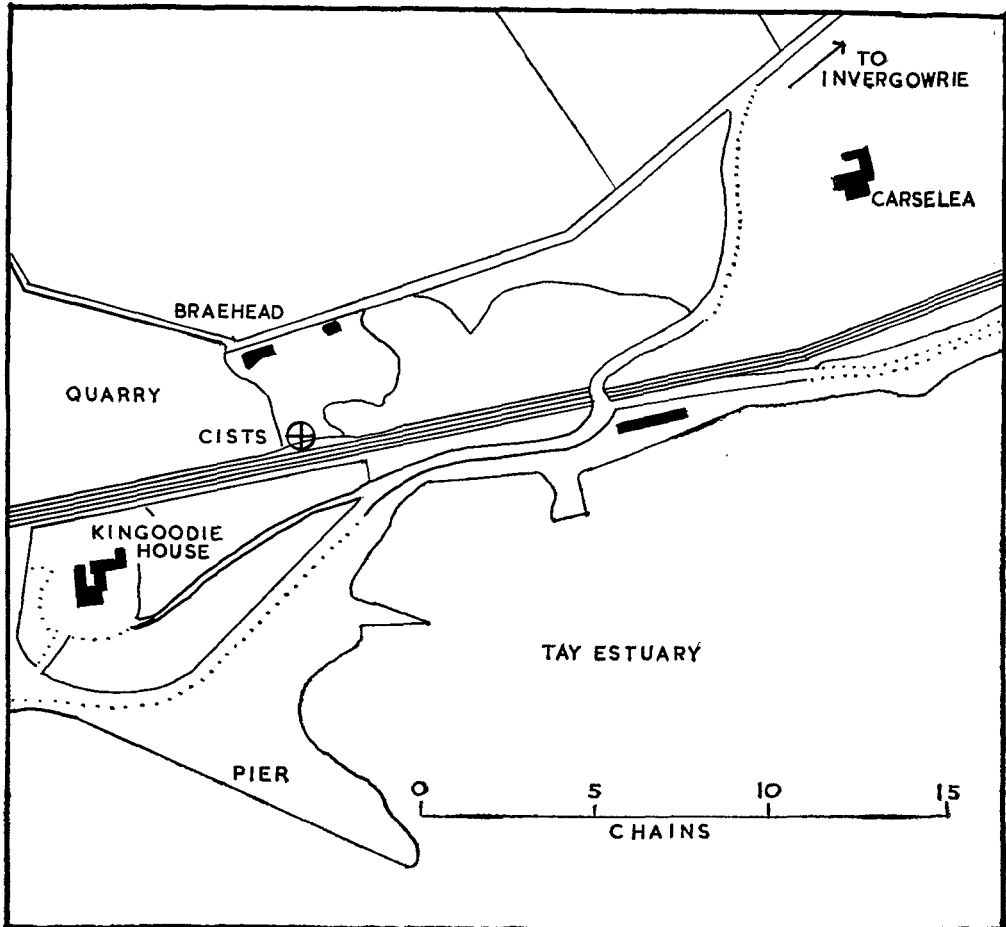


FIG. 1. Map showing location of the cists

#### SITE

The village and quarries of Kingoodie lie about a mile to the south-west of Invergowrie, alongside the road (B958) linking the latter with Errol. They are marked on the Ordnance Survey One-Inch, Six-inch and Twenty-five-Inch maps and plans, Sheet Nos. 50 (Seventh Series), Perthshire LXXXVIII NW., and Perthshire LXXXVIII-6, respectively (fig. 1).

The site of the burials is on the eastern edge of the quarry, on the crest of the

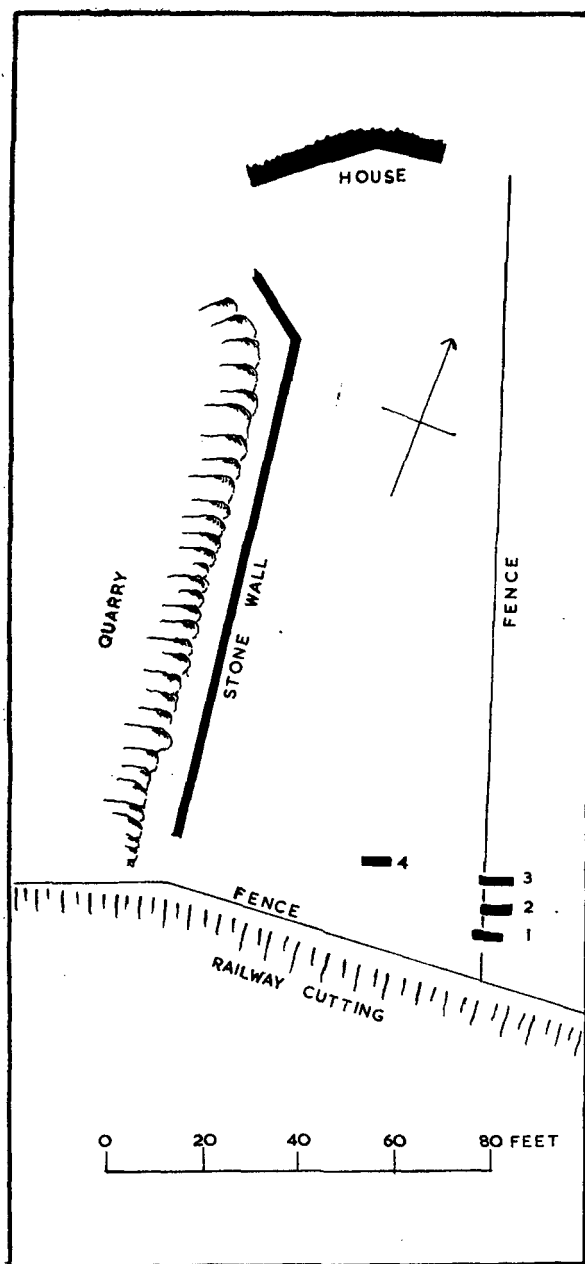


FIG. 2. General plan

headland already referred to, and overlooking a cutting on the Perth-Dundee railway, Kingoodie House and the Tay Estuary. The cists were situated 10 ft. from the fence which forms the southern boundary of the garden and 40 ft. from a new stone wall separating the garden from the quarry. The National Grid Reference is NO 341294.

The shore lies just over 100 yds. to the south while the 50-ft. contour, having skirted the edge of the quarry, runs for some distance eastwards almost parallel with the river bank. The site itself is just under 50 ft. above sea level (fig. 2).

#### THE CISTS

Cists 1, 2 and 3, as already indicated, had been badly disturbed by the removal of almost all the side slabs. In each case, however, they had been paved and this paving remained. Thus it was possible to obtain the dimensions and orientation.

Cist 1. Length: 5 ft. 9 in. Breadth: 1 ft. 5 in. at W. end, 1 ft. at E. end. Long axis:  $087^{\circ}$  (M).

Cist 2. Length: 5 ft., 8 in. Breadth: 1 ft. 8 in. at W. end, 1 ft. 2 in. at E. end. Long axis:  $069^{\circ}$  (M).

Cist 3. Length: 5 ft. 10 in. Breadth: 1 ft. 4 in. at W. end,  $9\frac{1}{2}$  in. at E. end. Long axis:  $071^{\circ}$  (M).

A few stones, used to pack the side slabs, remained in position at the east end of Cist 2, while the side and end slabs at the east end of Cist 3 were also intact. From this it was possible to estimate that Cist 3 had been 11 inches deep. The side slabs

that had been removed from these cists were in no case over two feet long and varied from one and a half to three inches thick (fig. 3).

The bones found in association with the remains of each cist were in a very fragmentary state, but the position of such of the skull and leg bones as were recovered confirmed that burial had been by inhumation and, that in each case, the body had been buried at full length with the head at the west end.

Despite a thorough search of the disturbed earth above the paving and of the riddled earth deposited nearby, no other relics were found.

There had been no trace of cover slabs. The first indication of the existence of the cists had been the appearance of slabs set on edge. The paving had been set

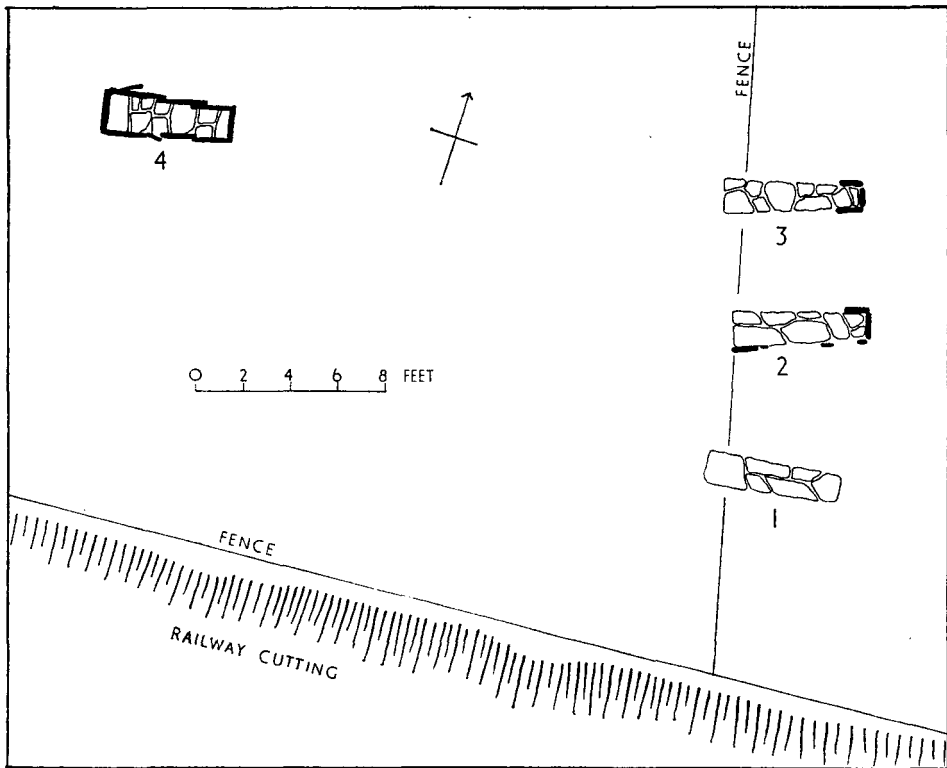


FIG. 3. Detailed plan

in the subsoil which consisted of a loose reddish brown sandy clay and lay 2 ft. below present ground level. The top twelve inches or so of soil consisted of a black loam while immediately below the paving, lay a much harder stratum of clay, redder in colour and containing numerous pebbles. This underlying stratum was found throughout the area of the garden.

The discovery of Cist 4 was again due to the removal and riddling of the top soil, but the cover slabs of this cist were still in place and, although the surrounding earth had been removed, it was possible to clear the cist completely. There were

five cover slabs in all, from 2 to 3 inches thick, projecting beyond the sides and east end of the cist but lying inside the slab forming the west end. Possibly as a result of this arrangement the sides of the cist had been distorted and the west end pushed outwards. The interior was entirely filled with earth and the question arose as to whether this had been done before the covers had been placed in position. The packed nature of this filling seemed to imply that this in fact was what had happened and that when the sides had partially collapsed, the weight of the covers had compacted the earth filling. During the subsequent excavation, however, it was noted that the lower jaw was found on the paved floor, an impossibility if the cist had been filled before the covers were placed in position (Pl. XII).

Cist No. 4, then, measured 5 ft. 4 in. in length, 1 ft. 4 in. in width at the west end and 1 ft. 2 in. at the east end. The depth was 11 in. Each side consisted of three slabs with a single slab at each end. As with the three previous burials, the floor of the cist was paved and the sides had been placed on top of the paving. Thus the grave had been dug, the floor paved and then the side and end slabs placed in position (fig. 3).

The bearing of the long axis was  $080^{\circ}$  (M) and the skull was found at the west end. This and other large bones remained undisturbed although very soft and friable, but by clearing the soil gradually, leaving several hours between each stage of the operation, the bones dried out and became firmer. The ultimate result is shown in Plate I. The skull was resting on a layer of earth 3 in. in depth while the other bones, apart from that of the lower jaw, were resting on less than an inch of soil. This fact, coupled with the position of such of the vertebrae that remained, seems to imply that the body was placed in the cist on its back with the head resting on a low pillow of earth, thus raising it slightly.

The paved floor was 1 ft. 11 in. below present ground level. As in the cases of the first three cists, the top soil to a depth of 11 in. consisted of a dark loam. Below, the same reddish brown sandy clay appeared and below that again, at a depth of 2 ft., the clay became much harder and redder in colour. The covers of cist No. 4 were only 10 in. below present ground level, but despite what must have been considerable disturbance of the top soil over more than a century, had remained intact. The slabs used in the construction of all four cists were of local sandstone, grey in colour, of which a plentiful supply was available close at hand.

#### THE CONTENTS

From the appended reports on the bones, contributed by Dr H. W. Y. Taylor of the Anatomy Department of Edinburgh University, the following summary of the contents of the cists can be obtained:

- Cist No. 1. Young adult, approaching maturity, probably female.
- Cist No. 2. Adult male, possibly between 30 and 40 years old.
- Cist No. 3. Adult. Insufficient evidence to determine sex.
- Cist No. 4. Adult female, between 30 and 40 years old, 5 ft.  $1\frac{3}{4}$  in. in height.

## DISCUSSION

The Kingoodie cemetery adds yet another example of long cist burials to the fairly extensive list of similar finds from the north shore of the Tay estuary. Once again, reliable dating evidence is lacking, no grave goods of any description having been found. The four cists were orientated east and west and the bodies had been placed therein at full length with the heads to the west. The construction – sides of small slabs, paved floor and the narrowing towards the feet – is typical enough of those found elsewhere. Although this small cemetery contained only four cists, others may have existed but were discovered and removed, unrecorded, when the railway cutting was constructed in the 1840s. In this case, no further evidence has been forthcoming to enable outstanding questions as to date and origin to be answered.

The existence of the early church at Dargie, a mile or so to the east of Kingoodie, where two cross slabs were discovered, perhaps indicates an earlier date for the present cemetery, although the precise date of the first church on the site is uncertain. A similar contiguity of church site and long cist cemetery is noted by R. B. K. Stevenson<sup>1</sup> and by Audrey Henshall.<sup>2</sup> A date of *c.* 900 seems to be reasonable for the cross slabs<sup>3</sup> but this does not help except, perhaps, to provide an upper limit for the cists. The suggestion that the cists are earlier than the church rests on the assumption that later burials would take place within the churchyard itself, an assumption supported by the fact that similar burials have, on a number of occasions, been found on and associated with early church sites.<sup>4</sup> The establishment of a lower time limit for such burials is of much greater importance. Evidence for this has been discussed by Audrey S. Henshall in connection with the discovery of the large cemetery of long cist burials at Parkburn, Lasswade.<sup>5</sup> The probable date of this group of burials is given as between the sixth and eighth centuries and it seems likely that the Kingoodie examples are of a similar age.

## ACKNOWLEDGMENTS

Thanks are due to the owner of the site, Mr D. M. G. Main, who offered every facility for the excavation of the site; to Mr J. D. Boyd, Museum and Art Galleries, Dundee for assistance in the photographic work; to Messrs D. Main, Jr., A. McColl, H. Payne and R. Kerr for assistance in the excavation of the site.

Finally, I would acknowledge a considerable debt to Dr H. W. Y. Taylor of the University of Edinburgh for the very full report on the contents of the cists appended below.

<sup>1</sup> *P.S.A.S.*, LXXXVI (1951–2), 108.

<sup>2</sup> *P.S.A.S.*, LXXXIX (1955–6), 271.

<sup>3</sup> Stevenson, R. B. K., *Problem of the Picts*, ed. F. T. Wainwright (1955), 126.

<sup>4</sup> *P.S.A.S.*, LXXXIX (1955–6), 269.

<sup>5</sup> *Ibid.*, 268–71.

## APPENDIX

## REPORT ON THE HUMAN REMAINS

by H. W. Y. Taylor, M.A., B.Sc., M.B., Ch.B., D.T.M.&H.

## CIST No. 1

Generally speaking the bones in Cist No. 1 are much decayed and fragmented. These had to be handled carefully because they were friable and adherent to pieces of soil.

*Skull.* The skull bones are represented by a large fragment of the frontal, three fragments of the occipital, almost complete right and left petrous temporal and a number of miscellaneous bone fragments the largest of which measure about one and a half inches long. The mandible and teeth are incomplete.

The frontal bone has prominent superciliary arches. The upper orbital margins of both orbits are intact, and the frontal eminences are moderately prominent.

The largest of the occipital bone fragments carries the posterior margin of the foramen magnum and the major part of the internal occipital crest. The other two fragments carry portions of the foramen magnum and the anterior condylar canals.

Of the facial bones the maxilla consists of a considerable fragment bearing seven teeth in good condition, namely two premolars and two molars on the right, with one premolar and two molars on the left. These show only slight signs of wear. The incisors and canines are absent and their alveolar sockets are severely damaged.

The mandible is comparatively well represented by right and left fragments large enough to form a chin. The body and both rami are almost intact. On the right side one canine, two premolar, and two molar teeth are in good condition. On the left side two premolar and two molars are also intact. The incisor teeth are absent and their alveolar sockets almost completely destroyed.

There is no sign of commencing eruption of the third molars in either the maxilla or the mandible.

The chin of the mandible is distinctly pointed.

*Vertebral Column.* The cervical vertebrae are incomplete. The second cervical vertebra is almost complete in itself and includes the odontoid process. The bodies of five others are typical but they carry either badly damaged arches and processes or none at all.

The thoracic vertebrae have two which are almost intact. The remaining five are more or less fragmented, and five are absent.

The lumbar vertebrae are represented by a few fragments.

The sacrum is seen as a few pieces of the promontory and parts of the adjacent alae. Coccygeal remains are either absent or unrecognisable.

There is no sign of disease in these remains of the vertebral column.

*Ribs.* The first rib of the right side of the thorax is almost intact. The fragments of the remaining ribs are not numerous. The majority of them belong to the right side.

*Upper Limb.* The right clavicle is almost complete; it is slender and light. The lateral third of the left clavicle has survived and resembles the right one in texture.

The right and left scapulae are represented by fragments which carry the glenoid fossae. In addition there is a larger fragment of an extraneous third scapula carrying part of its own glenoid fossa.

Large fragments of both humeri include the heads. These and one phalangeal bone complete the remains of the upper limb.

*Lower Limb.* In moderately good condition are two small pieces of the shaft of the femur, several large fragments of the right and left tibial shafts, and one small piece of a fibula. Parts of three tarsal bones, which include the talus and the calcaneum, are present.

The remaining fragments of bones are too small and incomplete to be identified with certainty.

*Comment*

The advanced state of decay of bones, resulting in the accretion of numerous small fragments of them, has limited the field of observation and deduction. Fortunately the maxilla and the mandible afford a clue to the condition of the teeth and point to the fact that the third molars have not yet erupted. The erupted teeth are in good condition, signs of wear amongst them being slight. Unfortunately, the incisors are not there to balance this condition of affairs.

The structure of the fragment of the frontal bone and of the mandible, along with the size of the fragments of the long bones, indicate that the skeleton is that of a young adult approaching maturity. What little evidence there is points to the possibility that the remains are those of a female.

The presence of a fragment of a third scapula did not complicate the picture. It was of a different texture from all the other fragments.

CIST No. 2

The contents consist of fragments of a human skeleton insufficient in size and in number to provide a true picture of it.

*Skull.* The bone fragments are parts of the frontal, occipital, parietal, temporal, maxillary, and mandibular bones. These include the superciliary arches and the frontal air sinuses. Any attempt at rearrangement is disappointing and could be misleading.

*Teeth.* Of the eight teeth none was attached. The teeth themselves were damaged but recognisable as six molars, one premolar, and probably one canine.

*Upper Limbs.* A portion of the Glenoid fossa of the left scapula, a small part of the head of a humerus, and a substantial piece of the shaft of the left humerus are the recognisable remains of the skeleton of the upper limbs.

*Lower Limbs.* The remains include a large portion of the shaft of the left femur broken into three pieces. There are also two large pieces of the shaft of the left tibia, a small fragment of the shaft of the left fibula, a left talus, a left navicular, parts of left and right calcanea, and a portion of the second left metatarsal bone.

*Comment*

The scantiness of the material makes conclusive findings impossible. From the size of the limb fragments, however, and from the state of development of several pieces of skull bones along with the presence of a number of fully developed teeth, the indications are that these skeletal remains came from a fully grown person, probably a male, and possibly between 30 and 40 years of age.

CIST No. 3

The contents consists of fragments of the skull, a number of teeth, and three portions of the shafts of limb bones.

*Skull.* There are eighteen fragments of the skull, all of them thick. The largest is part



of the right petrous temporal bone. Of the remainder three are easily identified, but the rest are too small and too irregular to be placed with certainty.

*Teeth.* Of the seven teeth one, a left molar, is attached to a fragment of the maxilla. The remaining six are in moderately good condition. They include five molars and one premolar. The degree of wear shown by these teeth is moderate. They are not attached to the jawbone.

*Limb Bones.* Of the portions of the shafts of limb bones, two are parts of the femur. The third portion resembles a part of the humerus.

The vertebrae, ribs, and other bones are absent.

#### *Comment*

The third molar tooth is identified as such by its relation to the first and second. This clue points to the conclusion that the skeletal remains are those of an adult person. The uniform thickness of the fragments of the skull is, in this case, not a reliable pointer to the sex of this individual.

#### CIST No. 4

*Contents of Cist No. 4.* These are skull bones, portions of the vertebral column, a small number of rib fragments, the limb bones with their girdles either whole or in part, and a few bones of the hands and feet. Like the majority of ancient bones they are lighter and more easily broken than bones from recently buried cadavers.

*Skull.* Generally speaking, the thickness of the skull bones varied from 1 mm. in the thinnest parts of the vault to 5 mm. in the occipital region.

The outer surface is extensively pitted over the vertex and on the right side. The inner surface, by contrast, is smooth and shows distinctly the grooves left upon it by the meningeal blood vessels.

Parts of the individual bones are missing and other parts are displaced.

*Norma Verticalis.* Viewed from above the shape of the skull is ovoid in outline, the width being greater posteriorly. The cranial vault is slightly flattened by a post-coronal depression.

The coronal and sagittal sutures are distinct.

The anterior portions of the zygomatic arches (cheek bones) are visible.

The frontal bone is almost intact. The major portions of both parietal bones along with the interparietal portion of the occipital bone are in position. The lambdoid suture, however, is incomplete.

The frontal and parietal eminences are not prominent. Generally speaking the sutures, as seen on the outer surfaces of the bones, show little sign of occlusion. The corresponding inner surfaces, however, are partially obliterated.

*Norma Frontalis.* Seen from in front, the whole face including the mandible is virtually complete. This effect is heightened by the presence of all the teeth except the first upper right incisor, which is missing.

The forehead is intact. From the orbital margins upwards it slopes gently backwards.

The nasion is normal and the glabella is located on a low eminence connecting the superciliary arches. These arches are not prominent.

The lateral portions of both supraorbital margins are sharp. The contour of the orbit is mainly quadrilateral. The upper margins of it, however, are arched.

The orbital fissures and optic foramina are intact.

The lacrimal fossae are present, and, on one side, the infraorbital groove, canal, and foramen are distinct.

*The Nose.* The nasal bones meet at an acute angle and project with moderate prominence. The nasal aperture is damaged but retains sufficient shape and size to show that the nose is not of the broad type. It also extends well up between the orbits.

There is no subnasal fossa.

*Maxillary Region.* The anterior nasal spine is prominent. The alveolar processes are well formed, and they carry a complete set of fully developed teeth, with the exception of the right medial incisor which appears to have been lost after death.

*Zygomatic Bones.* Both the cheek bones are intact and comparatively large. They protrude laterally far enough to be seen from above when the position known as the norma verticalis is used at arm's length.

*Mandible.* The lower jawbone is in good condition and carries a well preserved, complete set of adult teeth. The majority of these are embedded in equally well preserved sockets.

The body and both rami appear to have the same proportions – on comparison being made – as present-day man.

When the jaws are closed the coronoid processes reach a higher level than the condyloid ones. This is typical of juveniles and of a number of adult females.

The angle of the mandible is approximately 120°.

The mental and mandibular foramina are normal.

The mental protuberance and the accompanying tubercles are distinctly formed. The genial tubercles, upper and lower, are closely fused.

The lingulae of the mandibular foramina are clear cut.

At the angle the mandible is everted.

On the medial surface of the rami, between the mylo-hyoid groove and the angle, the surface of the bone is raised and roughened.

The mylo-hyoid and oblique lines, the sublingual, submaxillary, and digastric fossae are normal.

*Teeth.* The teeth show no signs of caries and are evenly matched. The upper surfaces of the incisors, by use, are worn flat. By diminishing degrees of wear the process can be traced to the third molars of both jaws. The mandibular and maxillary arcades of teeth are so closely opposed that the 'bite' between them would be largely edge to edge.

Of the three molars on each side of the mandible, the first is slightly larger than the second and the second than the third. In contrast to this the second molar of the maxilla is distinctly larger than the third.

*Norma Occipitalis.* Seen from behind it is evident that portions of the parietal bones near the medial plane are missing. The general outline of the posterior surface, however, is clearly seen.

The greater part of the lambdoid suture is easily traced. It shows signs of occlusion. Lambda itself is missing. The external occipital protuberance is not prominent. The slope of the back of the head is steep and its surface partially flat.

*Norma Lateralis.* The right side of the skull is complete except in the occipital area. The left side lacks the greater part of the squamous temporal bone and also a considerable part of the parietal one. The pterion is clearly seen on the right side and is normal.

The zygomatic arches, including their anterior and posterior roots, are in good condition. The temporal lines are not distinct except in the vicinity of the orbits.

The external auditory meatus, the mastoid process, and the base of the styloid process are present on both sides. The mastoid processes are prominent and narrow.

The infratemporal fossae are in moderately good condition and the right side is intact.

The outlines of the brow and face suggest that a slight degree of prognathism is present. But the gnathic index of 85 places it in the orthognathous group.

*Norma Basalis.* The condition of the lower surface of the skull is satisfactory. The damage to bones in this area is relatively slight. In the region of the maxilla the maxillary tuberosities are prominent.

The transverse and median longitudinal sutures of the palatine processes of the maxilla and of the horizontal plates of the two palatine bones are clearly marked.

The spines of the sphenoid and the lingulae of the mandible are outstanding.

For palatal and dental indices see the Tables of Measurements and also the comments on the skull.

### *Upper Limb*

The upper limb bones are represented by the following parts.

*The Left Clavicle,* in good condition, is 14.1 cm. long. Judging by its smooth surfaces, narrowness, and shallow curvatures, it is female in type.

*The Left Humerus* is also slight in build. It has an incomplete head, a complete neck, a shaft extending to the olecranon fossa, a well marked spiral groove, and a deltoid tuberosity which is not prominent.

*The Right Scapula* consists of a fragment of the glenoid fossa continuous with fragments of the coracoid process. Part of the spine of the scapula is present.

*Ulna.* The left ulna is almost complete; it displays a narrow troclear notch.

The right ulna consists of the upper half of the shaft.

*Radius.* The lower half of the shaft of the right radius and part of the shaft and lower end of the left radius are present. The last named possesses a complete carpal surface.

*Carpus.* The carpal bones are lacking.

*Metacarpals.* These are represented by the first three bones of the right hand and by the third bone of the left hand.

*Phalanges.* Two proximal phalanges are the only bones of the fingers.

### *Vertebral Column*

Apart from the last three lumbar vertebrae and the sacrum the vertebral column is poorly represented.

A complete odontoid process is attached to a small fragment of bone, and the right half of the atlas is in good condition.

Eight fragments can be identified as parts of the thoracic vertebrae.

*Sacrum.* The sacrum 12.2 cm. long and 11.7 cm. broad at the base, is partly indented here and there, especially on the right side.

From above downwards the curve of the smooth pelvic surface is decidedly 'flat' until the middle of the fourth sacral segment is reached. At this point the bone bends sharply forwards.

The 'auricular' surfaces of the sacrum are limited almost entirely to the first two segments of the sacrum.

*Coccyx.* The coccyx is absent.

*Ribs*

Of the fragments of ribs nine are of moderate size, the largest being 4 inches. These are recognisable as human.

*Lower Limbs*

*Pelvis.* The pelvis is represented by a large fragment on the right side which is made up of incomplete parts of the three component bones. Of the left side there remains a smaller fragment composed of parts of the ilium and ischium.

Both sides possess the greater sciatic notch, complete auricular surfaces for the sacroiliac joints, and pre-auricular sulci.

*Femur.* The left femur is made up of two large fragments which unite to complete the whole length of the bone now measuring 42.4 cm. The right femur, in three pieces, is incomplete and measures 41.2 cm. in length.

Both bones presented normally shaped, forward curving shafts. The linea aspera of both affords an example of pilastering, being narrower and more protruding than usual in the central portion.

The angle of the neck in both bones came within the normal range; the left one measured 122°.

The head of each femur measured 41 mm. in diameter. They are typically female in size.

The greater trochanters at one end and the condyles at the other are incomplete.

Both bones, in the region of the attachment of the gluteus maximus muscle, present an extended ridge along the lateral border of the posterior surface. The effect is a broadening of the upper part of the shaft in a lateral direction and is suggestive of a slight degree of platymerism. On measurement the platymeric index obtained was 88.6, a figure which brings it into the European group.

*Patella.* The right and left bones are normal.

*Tibia.* The shafts of both bones are well represented by large fragments. The distal end of the right one is almost complete and displays a malleolus similar to that of present-day man. The shafts of both bones, however, are abnormally flattened from side to side, showing the condition known as platycnemia. The index for this condition for both bones was 69, which indicates a high degree of flattening. The average European figure is 88.

*Fibula.* Three pieces of the shaft of the fibula are present. Two of them belong to the right bone. No abnormalities are noted.

*Tarsus.* Large fragments of the right and left calcanea are in fair condition. These are augmented by a part of the right talus, part of the right navicular and the major portion of the right lateral cuneiform.

*Metatarsus.* The greater part of the first metatarsal of the right foot is present.

*Comment on the Skull*

In a number of ways this skull resembles many of those found in both the Short Cists and Long Cists periods in Scottish history. The majority of these on the East side of Scotland were either large or of moderate size. This female cranium with a capacity of approximately 1,380 cc. is no exception.

Other points of similarity are the vertex of the skull, shaped like a low arch when traced in the transverse vertical plane through or behind the bregma, and the gradual slope downwards of the cranium from the sagittal suture over the parietal bones, especially in the region of the parietal eminence.

The lateral view of the cranium shows that the side walls are broadest in the vicinity of the squamous suture above the external ear. At the same time, the maximum occipital point is seen to be above and posterior to the external occipital protuberance.

The majority of these observations were made by Turner on similar skulls from the contents of cists examined by him a number of years ago.

The present skull is lighter than normal ones of similar size. Seen from above the cranium is ovoid and, because the cephalic index is 76.5, this skull lies between the dolichocephalic (75) and the brachycephalic (80) types.

The height of the skull is usually less than the breadth in the case of cists found in Scotland. In this case it is less by 20 mm.

Across the vault, posterior to the coronary suture, there is evidence of slight transverse constriction and depression of the parietal bones. This may be due to a mild degree of klinecephaly or to artificial binding of the head at an early age.

The nasal bones, lying at an acute angle to each other, project forwards prominently. The nasal aperture reaches far up between the orbits. The subnasal fossa is not visible.

The *Nasal Index* is 48. This figure lies on the border line between the majority of the white and yellow races. The white races (leptorrhine) are usually immediately below 48.

The plane of the nasal aperture faces downwards and forwards. This is normal for the white race.

The *Orbital Index* is 87.5 (mesoseme) and the interorbital interval measures 22 mm. The index figure indicates a degree of development which lies between the medium and the fullest human types of orbital development.

*The Palate* is not elongated. It forms the shape of a moderately wide horseshoe.

*The Upper Facial Index* is 58.5 and therefore leptoprosopic. This degree of narrowness is more pronounced than the usual averages given for Europeans.

*The Total Facial Index* of 95.6 supports the general impression of a long, narrow face.

Because the cranium is not quite complete the cranial capacity of 1,380 cc. may be erroneous to the extent of some 50 or more cubic centimetres. But, even if reduced to 1,300 cc. capacity, this skull, assumed to be female, would be above the average female skull for that period.

*The Cephalic Index*, 76.5, obtained from the greatest parietal breadth and the glabella-occipital length, can be taken as lying within a reasonably narrow margin of error. And the same can be said of the basi-bregmatic height of 124 mm.

*The Vertical Index* of 68.0 places it amongst the chamaecephalic group of skulls which is the lowest of the three named vertical index groups. But this lowest group is commonly found in Britain and in Europe and outnumbered the higher groups in the tables given by Turner for Long Cist skulls.

*The Gnathic Index* of 97.4 brings it into the orthognathous group which is largely European.

*Mandible.* There is a close similarity between this mandible and those of the same size of the present time. This is true of the general proportions of body, ramus, coronoid or condylar process, and also of the minutiae such as mental tubercles, mental foramina, and the extent of the mylo-hyoid line and groove.

The combined length of the molar teeth of the mandible exceeded that of the molar teeth of the maxilla, another link in the chains of similarity.

But the level and almost level 'surface wearing' of the teeth due to the 'edge to edge bite' of the upper and lower teeth introduces differences between the Stone Cist people and ourselves which appear to be to the detriment of our mandibles and our teeth.

*Table of Measurements of the Skull removed from Long Cist No. 4**Cranial Length, Breadth, Height, and Capacity*

Glabello-occipital Length	188 mm.	
Greatest Parietal Breadth (in the transverse plane)	144 mm.	
Basi-bregmatic Height	124 mm.	
Capacity	1380 cc.	
Cephalic Index	76.5	Mesaticephalic or mesocephalic
Vertical Index	68.0	Chamaecephalic
Gnathic Index	97.4	Orthognathous

*Longitudinal Arcs*

Frontal	126 mm.	Parietal	131 mm.
Occipital	122 mm.	Total	379 mm.
Narrowest Interfrontal Diameter at the Temporal Line 94 mm.			
Length of Foramen Magnum 35 mm.			
Nasal width 24 mm.; Nasal length 49 mm.; Nasal Index 48 (mesorhine)			
<i>Orbital Index</i> 87.5 mesoseme, i.e. not fully rounded			
Interorbital Interval (dacryon-dacryon) 22 mm.			

*Facial Indices*

Upper F.I.	$\frac{\text{Nasion-Prosthion Length} \times 100}{\text{Maximum Bi-zygomatic diameter}}$	58.5 (leptoprosopic)
Total F.I. (includes mandible)	$\frac{\text{Nasion-Lower border Symphysis Menti} \times 100}{\text{Maximum Bi-zygomatic diameter}}$	95.6 (leptoprosopic)

*Palatal Index* 109.2 dolichuranic

*Dental Index* 40.6 microdont

Index of Mandible 90.3

Index of Body of Mandible 90.5

Index of Ramus of Mandible 72.0

Angle of the Mandible 120 degrees

Depth of the Mandible at the Symphysis is 34 mm.

*Sex Characteristics*

Female characteristics are shown by the sacrum, pelvis, femur, clavicle, and skull.

*Sacrum.* On the pelvic surface of the sacrum the curve from above downwards to the middle of the fourth sacral segment is definitely 'flat'. There it bends sharply forwards.

The 'auricular surface' of the sacrum barely reaches to the third sacral segment.

The base of the sacrum is broad. The alae, however, are not so wide as usual and therefore not typical.

*Pelvis.* The fragment of bone from the right side includes the greater sciatic notch and the acetabulum. The former is moderately wide and bends at an angle of 85°. The size of the notch and the angle are female in type. The size of the acetabulum is also an indicator pointing in the same direction.

*Femur.* The heads of the right and left bones are small and almost intact. The head of the right femur fits evenly into the right acetabulum.

*Clavicle.* This bone is typically female in being short, smooth, and slender. Its curvatures also are less well marked than those of the usual male clavicle.

*Skull.* The skull is of light weight.

Viewed from above it presents a well shaped ovoid outline.

A slight transverse constriction and depression of the parietal bones is seen in the region of the coronal suture. When this is due to arrest of growth in the coronal suture the condition is known as klinocephaly. Female skulls normally show a tendency to klinocephaly.

The glabella and the superciliary arches are not prominent.

The parietal and frontal eminences are distinct but not markedly so.

The orbital margins are mainly sharp. And the orbital index of 87.5 also favours the female type of orbit.

The forehead is of the 'vertical' type.

The height of the skull is low, the basi-bregmatic measurement being 124 mm. as against a breadth of 144 mm.

The mastoid processes are narrow.

When the skull, with closed jaws, is laid upright on a flat surface the tip of the coronoid process of the mandible reaches a higher level than the articular head of the condyloid process.

*Height of the Body.* Calculated from a femoral length of 42.4 cm. the height of this person was 5 feet 1 $\frac{3}{4}$  inches.

*Male characteristics* are somewhat lacking. But the size of the mandible and of the teeth, along with the length of the face, at first sight appear masculine in character.

It is not possible to be dogmatic about the question of sex that arises from an examination of these bones, but the odds are weighted in favour of the female.

#### *Age*

*Teeth.* The teeth are evenly matched and free from any sign of caries. All the molars have erupted. The third molars show signs of use but are only slightly worn.

*Mandible.* The angle of the mandible, approximately 108°, is typical of adults.

These two facts exclude juvenility and senility. They are supported by the state of the cranial sutures, for example, the coronal which is meagrely fused externally, but well fused over considerable distances (by comparison) internally.

The absence of a suture between the basi-occiput and sphenoid bones points to the skull being that of a full grown adult.

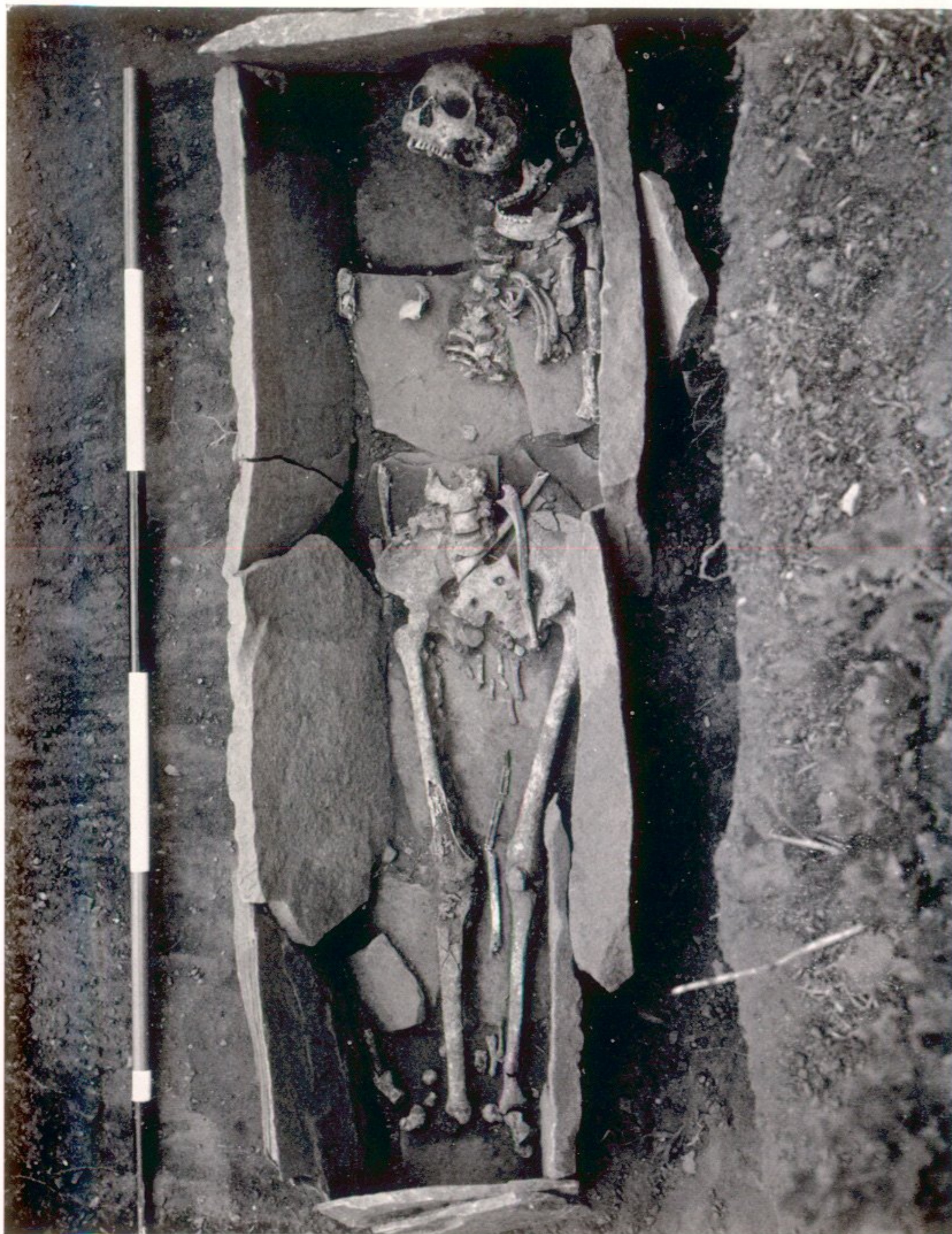
#### *Summary*

The main interest of this skeleton is the possession of a skull in a condition well above the average, one which includes a mandible of good shape with a complete set of fully grown teeth.

From the state of these teeth, backed by due consideration of cognate findings, it has been possible to make a prudent estimate of the age of this individual as someone between 30 and 40 years.

The question of sex has already been considered and the balance of evidence swung in favour of the female.





Cist No. 4

TAYLOR: LONG CIST BURIALS AT KINGOODIE