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TWO IRON-AGE CISTS FROM GALSON, ISLE OF LEWIS

MARGARET R PONTING

GALSON M R PONTING

CONTENTS

Clat 1

Margaret F Bruce

Skeletal remains from Galson. NB 436, 595.

(Ref:- Colin Scott Mackenzie, Procurator Fiscal, Stornoway;
Margaret Ponting, Callanish; Robert Dickie, Stornoway).

Excavation date	:	September 1984
Grave orientation	:	E/W; head to West: Supine
Grave construction	:	stone cist
Grave goods	:	none found
Earlier report	:	Dr. J. MacRae, Carloway and Barbara Noddle, Department of Anatomy, Cardiff University.
Our reference	:	Ga 1/84.

Detailed examination confirms the opinion that Ga 1/84 represents an adult female who was in her mid-twenties at the time of death. There is no evidence to suggest the cause of death, but it appears that she had experienced obstetrical trauma resulting from one or more pregnancies.

Physical characteristics

Ga 1/84 was probably between 163-169 cms. tall. This estimate is derived from formulae based on measurements taken from modern White American females(1) since obviously there are no direct means of estimating stature derived from the population to which Ga 1/84 belonged. Thus she was of average height by modern standards.

She was probably of medium build since the indices of robusticity for the upper and lower limbs fall within normal limits. Muscle markings are moderate/robust for a female skeleton. The limb proportions are unremarkable.

The skull shape was mesocranic, the face relatively narrow, the nose prominent but narrow and the upper incisors protruded i.e. there was considerable overjet present (fig. 1).

Interestingly the conformation of the femur was very similar to that of other Scottish short cist skeletons described by MacLaughlin & Bruce, 1983(2) where the presence of flattening of the proximal shaft was associated with the presence of laterally situated 'flange' of bone. The significance of this feature is not yet clear but it appears to be an adaptation to a particular pattern of stress.

This characteristic shape could have resulted from genetic factors, or from mechanical factors related to a habitual type of activity or postural pattern or from a combination of mechanical factors superimposed on a "shortage" of bone material due to nutritional deficiency. The shape seems to be more characteristic of prehistoric and historic femora than of modern femora.

The tibia by contrast is eurycnemic ("modern") in shape.

There are a number of features of the lower limb bones that are consistent with the hypothesis that a squatting posture was habitual viz: squatting facet

on the distal tibia (fig. 2) and on the talus, the nature of the femoral attachments of the gastrocnemius muscle (fig. 3), the development of the tibial tuberosity and the well-marked attachment of gluteus maximus which almost produced a third trochanter on the proximal femur.

Health status

There is no evidence as to the cause of death.

The bones are well-mineralised with no evidence of porosis or of deficiency disease. There is no evidence of cribra orbitalia which has been associated with prolonged anaemia. The teeth show no evidence of enamel hypoplasia which is frequently present where there has been a history of childhood illness.

The innominate bones and several vertebrae show lesions suggestive of earlier trauma. Both the ventral and dorsal aspects of the body of the pubis show bone change of the type associated with obstetrical trauma (figs. 4,5) as does the sacro-iliac articulation and the pre-auricular sulcus (fig. 6).

The superior and inferior surfaces of vertebral bodies in the lumbar and in the thoracic region show evidence of disc herniations (fig. 7).

The type of lesion differs in the two regions, being transverse across the posterior half of the vertebral surface in the lumbar region but sagittally oriented in the thoracic region (fig. 7). Schmorl's nodes, as these lesions are known, have been linked with obstetrical trauma(3) as well as with more general trauma, especially that associated with heavy compressive loading before the time when the vertebral column has completed development. The different types of lesion in the two regions may reflect different regional response to the same type to trauma or response to different types of trauma or differences in the timing of the traumatic events relative to the developmental state of the two regions.

In the context of obstetrical trauma in this individual, it should be noted that the pelvic inlet diameters were within the normal modern range.

The dental health of Ga 1/84 was good. There was less attrition than seen in e.g. Mediaeval Scots of comparable biological age. Periodontal health was good, there was no ante mortem tooth loss and no caries.

Height, limb proportions and well-mineralised bones and teeth suggest an individual with a normal growth pattern and adequate nutrition.

Special skeletal features

In the skull many of the foramina were double (figs. 8,9) and in some cases notches were converted to foramina by bars of bone. Some workers have suggested that there is a substantial genetic component to these non-metric features and that they may be useful in distinguishing populations. They are of little clinical significance however.

Comments

The observations made by Dr. MacRae and Barbara Noddle were noted(4). Although some features suggestive of male sex were present especially in the

skull, it was nevertheless felt that both metric and non-metric features of the innominate bone were very strongly indicative of female sex. These are listed below.

Non-metric features: Wide sciatic notch; broad pre-auricular sulcus; dorsal pitting on the pubic body; shape of the body of the pubis; elongated superior pubic ramus with relatively small acetabulum; ventral arc.

Metric features: The pubo-acetabular index value of 1.42 would have resulted in female attribution in any group for which this index has been estimated(5). The mean maximum femoral shaft diameter (25.5 cms.) also fell within the female range obtained from Scottish short cist skeletons(6).

It was felt that the sacrum was not markedly asymmetric and that such asymmetry as present was related more to timing differences in the fusion of R/L segments of the sacrum (fig. 10) than to sacral shape.

Observations on which age estimate is based

Basi-sphenoid/basi-occipital synchondrosis fused ($>$ 21 years); faint signs of iliac crest epiphyseal line (fusion early twenties); eruption into occlusion of third molars ($>$ 18 years) (fig. 11); incomplete sacral fusion; partial hyoid bone fusion; no manubrio-sternal fusion; incomplete skull sutural closure; dental attrition; lack of degenerative change on joints (other than sacro-iliac and pubic symphysis).

Other measurements and observations

Skull

Maximum length	184	mm
Nasion-lambda length	182	"
Basion-nasion length	100	"
Basion-alveolare length	93	"
Alveolare-nasion length	73	"
Maximum breadth	143	"
Minimum breadth	101	"
Ectomolare-ectomolare	98	"
Bizygomatic breadth	128	"
Bimaxillary breadth	90	"
Left orbital height	37	"
Right orbital height	36	"
Right orbital breadth	37	"
Nasal height	51	"
Nasal breadth	22	"
External palatal length	54	"
External palatal breadth	60	"
Cranial index	77.7	

Mandible

Bicondylar breadth	114 mm
Bigonial breadth	97 "
Left ramus breadth	35 "
Right ramus breadth	36 "
Left ramus height	75 "
Right ramus height	74 "
Symphyseal height	32 "
Mental foramen - Mental foramen	49 "
Mandibular length	89 "

All 32 permanent teeth were present in situ.

Non-metric observations

Double supra-orbital foramina; infra-orbital foramina; zygomatic foramina; anterior condylar canal tripartite on left, double on right; posterior condylar foramina present; mastoid foramina within the suture; "bridging" of L. greater palatine foramen and R. foramen ovale; bony spur linking lateral pterygoid plate to base of spine of sphenoid; left pterygoid place larger than right; bony spurs on the palate.

Vertebral column:- double transverse foramen; partial bony bridge over vertebral artery.

Appendicular skeleton

	L	R
Humerus length	330 mm	323 mm
" max. head diam.	47 "	47 "
" max. midshaft diam. ML	23 "	23 "
" " " " AP	19 "	19 "
" min. midshaft circum.	62 "	61 "
" robusticity index	18.7	18.8
Ulna max. length	267 mm	269 mm
" physiol. length	240 "	236 "
" min. midshaft circum.	42 "	42 "
" calibre index	17.7	17.5
Radius length	251 mm	254 mm
Humero-radial index	76.1	78.6
Clavicle length	137 mm	138 mm
Scapula maximum breadth	101 mm	105 mm
" spine length	129 "	126 "
Innominate maximum height	140 mm	149 mm
Pubo-acetabular index	-	1.42

	L	R
Femur max. length	439 mm	440 mm
" bicondylar length	435 "	437 "
" midshaft AP diam.	24 "	26 "
" " ML diam.	29 "	27 "
" max. shaft AP diam.	25 "	27 "
" max. shaft ML diam.	28 "	26 "
" bicondylar width	74 "	75 "
" max. head diam.	43 "	44 "
Platymeric index L (24/32 x 100)	75	
R (23/31 x 100)		74
Tibia anterior length	375 mm	373 mm
posterior length	375 "	373 "
position of nutrient foramen	255 "	253 "
AP diam. at nutrient foramen	33 "	33 "
ML diam. at nutrient foramen	25 "	26 "
AP at one-third level	32 "	32 "
ML at one-third level	24 "	25 "
Cnemic index (nutrient foramen)	76	79
Cnemic index (one-third)	75	78
Fibula length	365 mm	361 mm

Bones present: The skeleton was in a remarkable state of preservation. The only skeletal elements missing were:- left greater wing of hyoid; xiphoid; left cuboid, left 2nd metatarsal, phalanges of left foot for toes 2-5; right medial cuneiform, first metatarsal and phalanges; transverse processes and spines of thoracic vertebrae are damaged, as is left pubic bone.

(Measurements according to (7), tibial shaft measurements according to (8)).

References:

(1) Trotter, M. 1970. Personal Identification in Mass Disaster, ed. T.D. Stewart 1970.

(2) MacLaughlin, S. and Bruce, M. 1983. J. Anatomy 137, 435.

(3) Owsley, D. and Bradtmiller, B. 1983. Am. J. Physical Anthropology 61, 331.

(4) Report on Galson grave, September 1984.

(5) MacLaughlin, S. and Bruce, M. 1985. J. Anatomy 140, 532.

(6) MacLaughlin, S. and Bruce, M. 1985. Am. J. Physical Anthropology (in press).

(7) Bass, W. 1979. Human Osteology.

(8) Cross, J. and Bruce, M. 1985. J. Anatomy 140, 533.

Fig 1. Skull, lateral view. Galson 1/84.
1 - coronal suture unfused,
2 - prominent nasal bones,
3 - projecting maxillary incisors.

Fig 2. Right tibia, Galson 1/84.
Squatting facet.

Fig 3. R. & L. femora, Galson 1/84. Attachments of medial head of gastrocnemius.

Fig 4. R. Pubic bone, external aspect; Galson 1/84. Irregular bone surface.

Fig 5. R. Pubic bone, internal aspect. Galson 1/84. Dorsal pitting.

Fig 6. Left Innominate, internal aspect. Galson 1/84. 1 - preauricular sulcus; 2 - bone exostoses; arrows - wide sciatic notch.

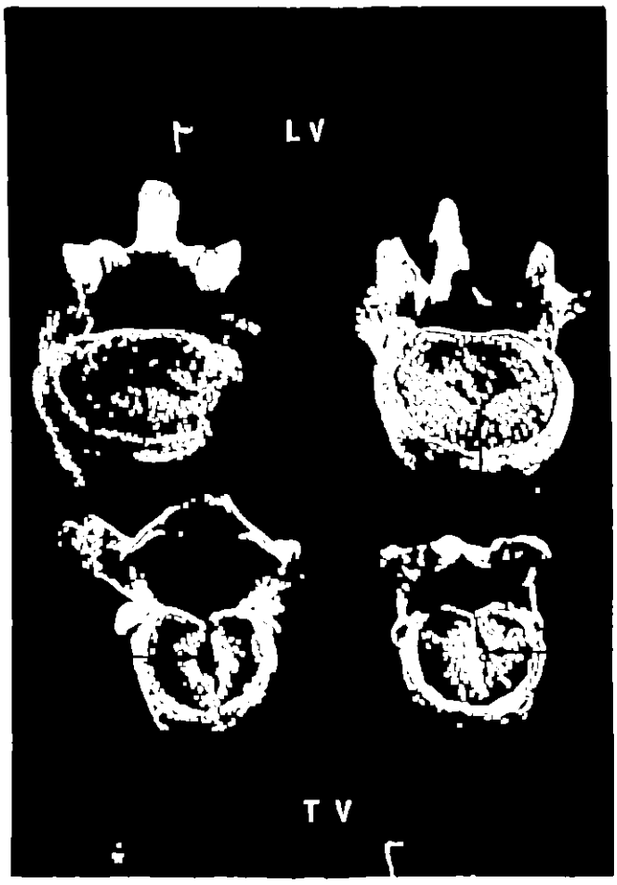

Fig 7. Vertebrae, Galson 1/84. Transverse lesions on lumbar vertebral bodies in lumbar region (LV); sagittal lesions in thoracic region (TV).

Fig 8. Skull, Galson 1/84. 1 - supraorbital foramina. 2 - infraorbital foramina.

Fig 9. Palate, Galson 1/84. 1 - palatine foramina, 2 - infraorbital foramina, 3 - erupted third molars.

Fig 10. Sacrum, ventral aspect Galson 1/84. Incomplete fusion.

Fig 11. Mandible, Galson 1/84; erupted third molars.

Skeletal remains from Isle of Lewis

Reference: (Margaret Ponting, Callanish;
Robert Dickie, Stornoway)

Identification reference 'Cheshire'

Specimen: Mandible, broken with dentition in situ and loose.

Description: The mandible is from a human juvenile, aged about 14-15 years according to the eruption in occlusion and the extent of wear of the second permanent molar teeth. The roots are short with a crown-root ratio of approximately 1:1. There are deep fissures on the second molar teeth which would have (if not triturated) predisposed to caries formation had the individual lived.

Clst 2

Margaret F Bruce

Skeletal remains from Galson

(Ref: Colin Scott Mackenzie, Procurator Fiscal, Stornoway;

Robert Dickie, Stornoway;

Margaret Ponting, Callanish)

Excavation date: see M. Ponting

Grave orientation: see M. Ponting

Grave construction: short cist

Grave goods: see M. Ponting

Our reference: Ga 2/84

As with the skeleton Ga 1/84, these bones are in a remarkably good state of preservation.

The remains are those of an adult male aged 35-40 years. There is no evidence as to the cause of death but there is evidence of healed injury to the left innominate bone and of dental pathology.

Physical characteristics

Ga 2/84 was probably about 171cms (± 4cms) tall (5'7") which is about the average height for Scottish short cist males, but is below the mean male height estimated for British Bronze Age males (Manchester, 1983). Interestingly the female Ga 1/84 was taller than the average for Scottish short cist females. The left upper limb was somewhat more robust than the right although the right was longer. The limb proportions were unremarkable. Muscle attachments were marked in the femur and tibia. Skull shape was dolicocranic (long-headed). This is in contrast to the general brachycrany (short, round-headedness) of the Scottish short cist population, although the latter does also contain a proportion of long-headed individuals. The face showed no special features of note.

As in Ga 1/84 and in all Scottish short cist femora so far examined (MacLaughlin and Bruce, 1983) there was a pronounced lateral flange on the proximal femoral shaft. In addition the femora showed pronounced pilastering

or reinforcing posteriorly. The tibiae were mesocnemic in shape, that is they showed no marked flattening of the upper third of the shaft.

Health status

There was no evidence as to the cause of death.

Height, limb proportions and heavy, well-mineralised bones and teeth suggest little childhood growth disturbance or dietary imbalance. A number of interesting, though probably insignificant in the clinical sense at least, anomalies were present. The following were undoubtedly congenital in origin - the lateral extremities of the spines of the scapulae had not fused to the remainder of the bone as usually happens by the age of about twenty; the xiphoid process of the sternum was bifid and there was a cervical rib present on the left side; numerous Wormian bones were present in the lambdoid suture of the skull (figs. 1-4).

The anterior superior iliac spine of the innominate bone was markedly irregular in shape probably the result of an old healed avulsion fracture, perhaps as the result of strenuous physical activity. Another feature of note was the separated neural arch of the fifth lumbar vertebra - a condition known as spondylolysis, the causes of which are not clear. It has been associated with trauma and has been also said to have a genetic basis. It is more common in males than females. Interestingly the incidence of this condition in Scottish short cist skeletons housed in the University of Aberdeen is about 15% which is higher than that recorded for most skeletal collections except for populations such as the Eskimos where the arduous lifestyle has been held responsible for the high incidence. Possibly as a result of this condition the surfaces of the neighbouring sacro-iliac joints show marked degenerative change with considerable bony overgrowth of the joint margins, particularly on the right. The spondylolysis at the fifth lumbar vertebra may also account for the presence

of an upward projection on the right articular facet of the sacrum which may have stabilised the detached portion of the vertebra above. Often this spondylolytic condition is asymptomatic but it has also been implicated in low back pain. There was relatively little evidence of degenerative change on the remainder of the vertebral column - some lipping was present on several thoracic and lumbar vertebral bodies. Schmorl's nodes were present on the vertebral surfaces from TV10 (inferior) through LV3 (inferior). Ga 1/84 also showed evidence of these lesions which have often been linked with trauma caused by heavy compressive loading of the spine.

Small button osteomata or benign bone tumours were present on the skull, the largest on the left frontal bone being about 1cm in diameter.

The third right molar had been lost fairly recently before death and the third right upper molar was in imminent danger of being exfoliated at the time of death (fig. 5). There was evidence of abscess formation on the upper right and left jaws. All the teeth showed heavy calculus (tartar) deposits and very considerable attrition of their biting surfaces, down to the pulp cavity in some instances. The individual is likely to have suffered considerable pain and it is not beyond the bounds of possibility that the spread of oral sepsis to the general circulation could have been responsible for his death. The very heavy dental attrition is no doubt the result of heavy mastication of tough fibrous material and/or of the presence of shell fragments from shellfish or grit from stone-ground grain.

Non-metric features of the skeleton

The jugular foramen on the right had a bridge of bone dividing the vascular from the neural compartments; posterior condylar canals were present on the right and left; the mastoid foramen was double on the left; supra-orbital notches were present on the right and left. The canal for the vertebral artery on the atlas was partly bridged by bone on the left; the transverse foramina

were double on the right and left on CV5, on the right on CV6 and partially divided on the left on CV6. A third trochanter was present on both femora. The nutrient foramen on the left tibia was double. The peroneal tubercle on the right calcaneus was well marked.

Observations on which sex was based:- form of the pubis and sciatic notch in the pelvis, relatively large acetabulum; the maximum femoral shaft diameter (33mm) was well within the the male range (MacLaughlin and Bruce, 1985); pubo-acetabular index 1.13 (MacLaughlin and Bruce, 1985b). Observations on which age is based:- stage of dental attrition; pubic symphyseal surface; vertebral degeneration; ossified laryngeal cartilages (fig. 6).

Metric observations

Skull

Maximum length	188mm
Nasion-lambda length	180mm
Basion-nasion length	101mm
Basion-alveolare length	98mm
Basion-bregma length	141mm
Alveolare-nasion	68.5mm
Maximum breadth	136mm
Minimum breadth	96mm
Ectomolare-Ectomolare	71mm
Bizygomatic breadth	138mm
Bimaxillary breadth	93mm
Left orbital height	36.0mm
Left " breadth	44.6mm
Right " height	35.4mm
Right orbital breadth	45.0mm

Nasal height	55.1mm
Nasal breadth	26.0mm
External palatine length	53.2mm
" " breadth	69.4mm

Cranial index 72

Mandible

Bicondylar breadth	119mm
Bigonial breadth	101mm
Left ramus breadth	35.5mm
Right " "	35.5mm
Left coronoid height	69.0mm
Right " "	70.0mm
Symphysial height	33.3mm
Mental foramen - mental foramen	50.0mm
Maximum length	120mm

Attrition scores (after Kerr, Cross and Bruce, British Archaeology Reports, in press)

Maxilla

	1M	2M	3M	:		1M	2M	3M
R	10 10	10 9	9 9		L	10 10	10 9	9 9
	9 8	8 8	8 8			9 9	8 8	8 8
	37	35	34			38	35	34

Mandible

R	9 8	8 8	X	:	L	9 8	8 8	X
	9 8	8 8				9 8	9 9	
	34	32				34	34	

Post-cranial skeleton (mm)

		L	R
Humerus length		328	333
" maximum head diameter		49.4	49.5
" " midshaft diameter (ML)		21	23
" " " " (AP)		19	20
" minimum " circumference		65	62
" bicondylar width		66	67
Robusticity index		19.5	18.6
Ulna maximum length		275	278
" physiological length		237	238
" minimum shaft circumference		37	39
" calibre index		15.6	16.3
Radius length		252	254
Humero-radial index		77	76
Clavicle length		154	162
Scapula maximum breadth		-	115
Pubo-acetabular index	1.13		
Femur maximum length		453	450
" bicondylar length		445	444
" midshaft A.P. diameter		33.0	34.0
" " M.L. "		29.4	28.0
" maximum shaft A.P. diameter		34.0	35.1
" " " M.L. diameter		29.3	30.0
" bicondylar width		89.2	91.0
" maximum head diameter		50.0	50.3
Platycnemic index	69.4		

Tibia anterior length	375	375
" posterior "	377	375
Position of nutrient foramen	265	255
A.P. diameter at nutrient foramen	41	38
M.L. " " " "	26	25
Tibia AP diameter at 1/3 level	38	39
" ML " " " "	26	25
Cnemic index nutrient foramen	63	65
Cnemic index 1/3 level	68	64
Fibular length	372	-

All bones of the skeleton were present except the hyoid.

Radiographs of the innominate and LV5 pathology are available from the Department of Anatomy, Marischal College, Aberdeen.

Measurements were according to Bass, 1979; tibial shaft measurements according to Cross and Bruce, 1985; pubo-acetabular index and maximum femoral shaft diameter as in MacLaughlin and Bruce, 1985a and b.

References

Bass, W. (1979) Human Osteology.

Cross, J.F. and Bruce, M.F. (1985) J. Anatomy, 140, 533.

MacLaughlin, S.M. and Bruce, M.F. (1985a) Am. J. Physical Anthropology 67, 413-8

MacLaughlin, S.M. and Bruce, M.F. (1985b) J. Anatomy, 140, 532.

MacLaughlin, S.M. and Bruce, M.F. (1983) J. Anatomy, 137, 435.

Manchester, K. (1983) The Archaeology of Disease. Bradford University Press.

Ga 2/84

fig 1. Ga 2/84. Bilateral non-fusion of acromial process to the spine of the scapula.

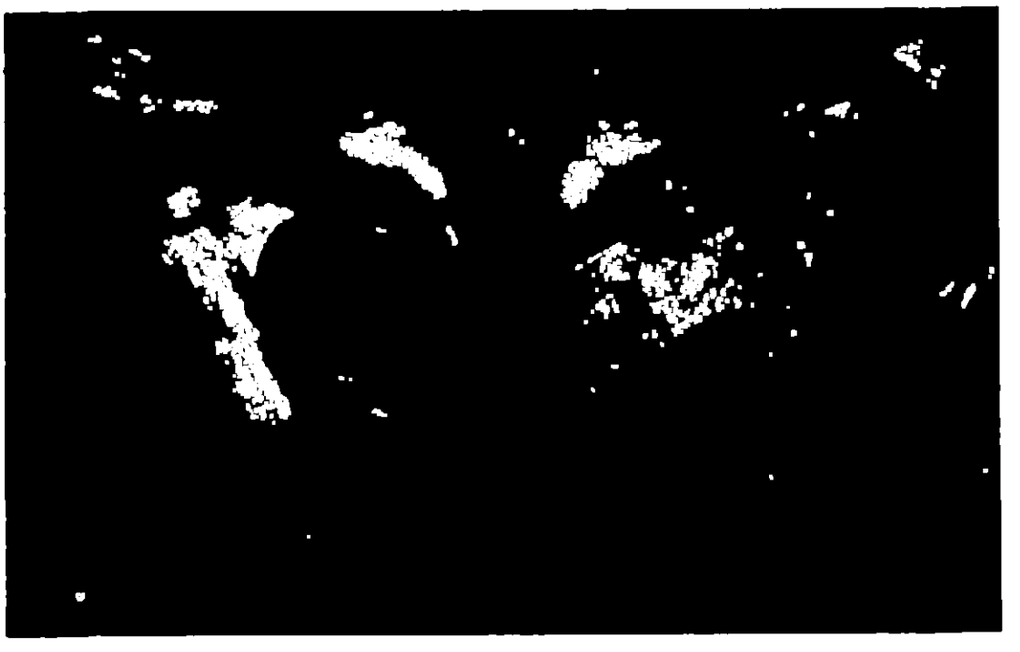

fig 2. Ga 2/84. Bifid xiphoid process of the sternum.

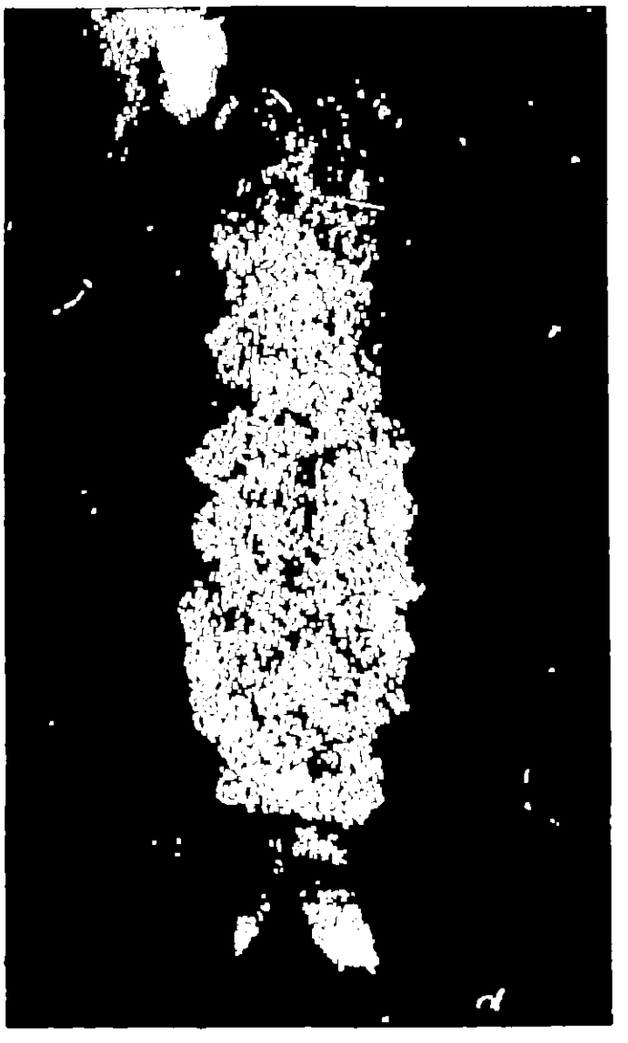

fig 3. Ga 2/84. Cervical rib.

fig 4. Ga 2/84. Wormian ossicles.

fig 5. Ga 2/84. Skull showing dental pathology.

fig 6. Ga 2/84. Ossified laryngeal cartilages
(a) thyroid (b) cricoid.