

Illus 1 Site location plan.

Excavations within the graveyard of the Holy Trinity, St Andrews, Fife

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with contributions by Kathleen MacSweeney, Naomi Crowley, and Effie Photos-Jones

Introduction

This paper presents the findings of an archaeological excavation undertaken in support of the renewal and expansion of the Public Library in St Andrews, Fife, which occupies the NW corner of the defunct graveyard of the Parish Church of the Holy Trinity (Holy Trinity Church). The works were initiated in response to the need to underpin the eastern gable of the early 19th-century library building, and excavate a lift shaft pit adjacent to the same wall.

Repairs and improvements to the library building were preceded by an archaeological excavation carried out in 2003 by Rathmell Archaeology Ltd. As expected, important evidence relating to the town's medieval past was revealed, in particular skeletal remains, and building debris which pre-dated the graveyard and may relate to the construction of the church.

Historical background

The Holy Trinity Church

Lying within the cathedral precinct, the original parish church of St Andrews was built in 1112 by Bishop Turgot (Russell Walker 1888) and subsequently dedicated to the Holy Trinity by Bishop Bernhome. This building became inadequate for the parish's needs by the late 14th century. Following a gift of land by Sir William Lindsay of Bynes in 1410, the parish church relocated to its present position on South Street. The land gifted in the 'Golden Charter' was described as: 'All of his lands lying in the city of St Andrews in South Street on the north side thereof, between the lands of the heirs of the deceased Rankin Braboner on the west, and the common vennel leading to the Market Cross of the said city on the east' (Rankin 1955, 22).

The ground comprised the southern half of six rigs fronting onto South Street. A further grant of land in 1430 by Bishop Wardlaw, consisting of a seventh half rig, allowed the expansion of the graveyard. This seventh rig was acquired from Rankin Brabonere (Henry 1912, 62) and it lay to the west of the Holy Trinity, fronting Logies Lane. The church was built between 1410 and 1412, its graveyard bounded by a row of houses to the N and enclosed by a wall on three sides. Geddy's 1580 plan illustrates the church and graveyard at its probable full extent.

It has previously been suggested that the closure of the graveyard to new inhumations took place around the Reformation, c 1560 (Mackenzie and Moloney 1997). Certainly this was the first opportunity for the burgh population to access the previously restricted ecclesiastical burial grounds within the Cathedral Precinct. The monumental inscriptions in the eastern burial ground indicate, however, that the earliest surviving monuments derive from the early 1600s (Mitchell and Mitchell 1971). This may suggest that the graveyard of the Holy Trinity Church remained in use for several decades beyond 1560.

At the end of the 18th century the church was substantially altered, rebuilt and expanded, providing accommodation for 2500 parishioners (Russell Walker 1888). A second rebuild at the start of the 20th century attempted to restore some of the medieval character of the church and reduce its size. It was during the course of these works that excavations revealed 'roots of some size ... suggestive of pear trees' (Henry 1912, Simpson and Stevenson 1981).

The 1988 and 1991 graveyard excavations

During December 1988 SUAT undertook an evaluation, which was followed in 1991 by an excavation (Mackenzie and Moloney 1997) in support of an environmental improvement scheme for Logies Lane and Church Square. This resulted in the cutting of a series of linear trenches for services and rectangular tree pits across areas of the graveyard.

The excavations lifted elements of some 121 individuals, although due to the size of the trenches no whole skeletons were recovered. The vast majority of burials were aligned W to E and buried in shrouds within a homogenised graveyard soil. Very rarely, a slightly different alignment was noted. The inference drawn was that the highest concentration of inhumations occurred at the western porch of the church, with the remainder of the graveyard being less intensively used. The maximum depth of inhumation was 1m below current ground level, and at most, the skeletons were buried eight deep.

Structural remains were also identified, occupying the frontage onto South Street and Logies Lane. These were interpreted as pre-dating the construction of the church. In addition, a demolition – or perhaps construction – horizon of shattered stone was located to the W of the church. The inference of the excavators

was that these structures pre-dated the church, this conclusion being based on the presence of the overlying graveyard. However, this thesis omits to recognise that the western limit of the graveyard was on ground gifted by Bishop Wardlaw in 1420, *after* the completion of the Holy Trinity Church. Consequently these structures can only be inferred to predate c 1420, *contra* Mackenzie and Moloney 1997.

The library building

The library stands within the NW corner of the enclosed graveyard as depicted by Geddy (1580). By 1745 (Ainslie), there are small buildings lying along the northern boundary of the graveyard on the site of the later library, but by 1820 (Wood), these are replaced by a large rectangular structure. It can thus be concluded that the building which subsequently became the library was constructed in the early 19th century, with one source proposing a construction date of 1811, which appears credible. In 1820 Wood identifies the main building as an 'English School', while the neighbouring structure is identified as a 'Reservoir'. By the 1st edition Ordnance Survey (1854) the structure is labelled as 'City Hall' and an internal ground plan is provided. Subsequently, in the 20th century, the building was reused as the burgh's public library incorporating the Hay Fleming Reference Library.

The excavations

Fife Council Technical Services managed the redevelopment on behalf of Fife Council Library Services, taking advice and guidance from Mr Douglas Speirs of the Archaeological Unit within Fife Council Development Services. Rathmell Archaeology Ltd was appointed during July and August 2003 to excavate the lift shaft pit and adjacent underpin trenches within the Public Library, at the E end of the main structure against the E gable wall.

The library was floored with concrete slab (001) that surfaced a depth of hardcore and rubble (002). The floor surface was at 21.75m OD. This layer of hardcore buried the remnants of two mortared walls (003); the first ran parallel to the E gable wall, with the second running perpendicular to and abutting the W side of the first. To the E of the N-S wall (003) evidence was found for some floored surfaces and steps (007) within the lower horizons of the rubble. Combined, these layers amounted to some 0.4m of material.

Underlying the rubble and associated walls was a deep homogenised graveyard soil (004) that contained numerous articulated and disarticulated skeletal material. The articulated skeletons were generally aligned E to W, with their heads lying to the W. However, some of the basal skeletons within the sequence appeared to be on a subtly different alignment, being slightly SW to NE. The heights for skeletal

material from the excavation range from 21.17m to 20.17m OD and in total, elements of some 76 articulated skeletons were lifted.

No gravecuts were visible, although there was clear evidence for the loss of some elements of articulated skeletons from the insertion of later burials. There was no evidence of coffins or gravegoods. A volume of broken sherds of pottery, animal bone and occasional marine shell was recovered from the graveyard soil.

Towards the base of the graveyard soil two layers of sand were noted (037 and 021) at different locations, appearing at the same level as a stone-rich layer of the graveyard soil (004). These sand layers comprised clean orange sand that overlay the lower graveyard soil (067). The southernmost had an upper surface of small pebbles (077), from which a quantity of industrial ceramics, slag, charcoal and domestic ceramics was recovered. Both sand layers were clearly truncated in their lateral spread by abrupt interfaces, matching the outlines of articulated skeletons that lay at a deeper level.

The stone-rich layer of the graveyard (004) was formed predominantly of sub-angular sandstone fragments that proved moderately hard to excavate. A limited number of gravecuts penetrated this stone-rich layer, with the vast majority of articulated skeletons lying above it. The only articulated skeletons located below it were associated with gravecuts through this stone-rich layer. There was a notable absence of disarticulated skeletal material both within and below this layer.

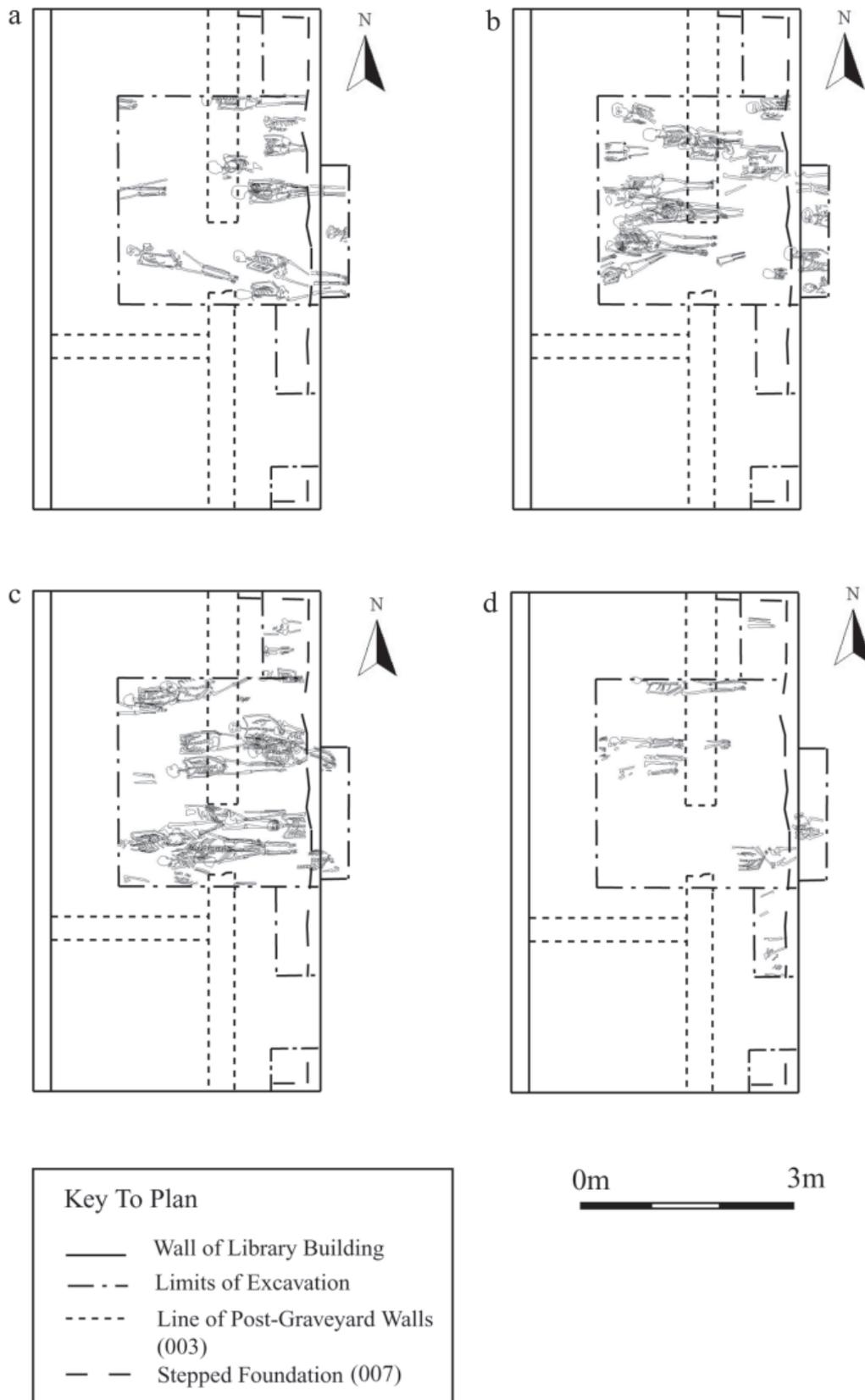
Underlying the lower graveyard soil (067) was the natural sand subsoil (085). This was exposed across the bed of the excavations and no negative features were identified penetrating to a greater depth.

The skeletal assemblage

Kathleen MacSweeney

A total of 76 articulated skeletons and numerous disarticulated bones were recovered. From this material some 27 skeletons (selected for better state of preservation) were analysed. Consequently the analysed assemblage cannot be taken to be truly reflective of the living population; it does, however, provide an insight into the morphology, health and lifestyle of the whole population. Methods of recording and assessing age, sex and pathology are based on the standards recommended in Buikstra and Ubelaker (1994). Calculations of stature are founded on the formulae devised by Trotter and Gleser, as outlined in Bass (1995).

Some 37% of the total number of individuals were immature (Table 1); this appears fairly high, especially given that no neonates were included. The percentage is higher than the 1991 excavations where immature remains accounted for 26% of the total. Comparable levels of immature remains came from Aberdeen



Illus 2 Plan of excavated area, showing the human skeletal remains occurring at different levels.

Skeletal remains lying:

a between 19.72 and 20.44m OD

b between 20.45 and 20.69m OD

c between 20.70 and 20.93m OD

d between 20.94 and 21.70m OD



Illus 3 View of excavated area, with in situ human skeletal remains.

Table 1 The age range of individuals occurring amongst the skeletal assemblage recovered from the graveyard of the Holy Trinity, St Andrews, Fife.

age classification	age range	number of skeletons
Foetus	prenatal	0
Neonate	birth to 3 months	0
Infant	4 months to 5 years	2 (7%)
Child	5 to 12 years	5 (19%)
Adolescent	12 to 18 years	3 (11%)
Young Adult	18 to 35 years	4 (15%)
Middle Aged Adult	35 to 45 years	9 (33%)
Old Adult	45+ years	4 (15%)

Table 2 Average height amongst Scottish late medieval populations, as calculated from evidence provided by skeletal assemblages recovered during recent archaeological excavations.

site	male	female	reference
Aberdeen	168	160	Bruce and Cross 1989
Linlithgow	170	156	Bruce and Cross 1989
Dundee	172	156	Spalding et al 1996
Whithorn	170	156	Cardy 1997a
St.Andrews, Kirkhill	169	159	Bruce et al 1997
St Andrews, Holy Trinity 1991	169	157	Cardy 1997b
Ensay	166	155	Miles 1989
St Andrews, Library 2003	163	154	

Carmelite Friary (36%) and Whithorn (33%), while at Linlithgow sub-adults were very numerous at 58%.

The highest number of adult deaths in any one category was in the Middle Aged Adult group (33%) with 15% in each of the Young and Old Adult categories. This is similar to the findings from Kirkhill Cemetery where by far the majority of adults died in middle age (Bruce et al, 1997). Bruce et al commented in the Kirkhill Cemetery report that a small but significant proportion of the population (14%) survived into old age. This may also be true of the 1991 excavations where 24% of the total examined adults were considered old.

Assessment of sex for the 17 adults and two of the adolescents determined ten males; seven females and two indeterminates. There was evidently a low level of sexual dimorphism in this population; very few individuals were clearly male or female and in most cases, sex had to be assessed on the basis of whatever was the greatest number of characteristics for that sex. As the individuals examined had a good state of preservation; had all of the excavated remains been examined, the number of unsexed individuals would have been much greater. Low level of sexual dimorphism was a feature noted in other similar populations, for example, at Kirkhill Cemetery, St Andrews (Bruce et al, 1997) and at Aberdeen, Linlithgow and Perth (Bruce and Cross 1989).

Height could be calculated for all 17 adults showing that male height ranged from 150.5cm (4' 11¹/₄") to 170cm (5' 6⁷/₈"), and averaged 163.1cm (5' 4"). Female height ranged from 146cm (4' 9¹/₂") to 157.5cm (5' 2") and averaged 154.3cm (5' 11¹/₄"). When compared with other broadly contemporary Scottish sites (Table 2), average height was poorer, particularly among the males. The reason for this is not entirely clear; although the analysed sample may not be truly representative and calculations of stature using limb bones carry a standard deviation of between 2.5 and 4.5cm.

A total of 14 skulls were sufficiently complete to enable head shape to be assessed. In eight of these the Cranial Index, a means of assessing skull shape (length relative to breadth), could be assessed. One individual was found to be dolichocranic (narrow or long headed), four were mesocranic (average or medium headed) and three were brachycranial (broad or round headed). There

does not appear to be any sexual significance to these differences.

A condition known as bathrocephaly was fairly common. This anomaly is characterised by numerous wormian (accessory) bones within the lambdoid suture (the suture at the superior, posterior part of the cranium, situated between the occipital bone and the parietal bones). The presence of these accessory bones seems to be the cause of the development of a shelf-like projection at the back of the skull, also known as an occipital bun. This condition was present in five of the 14 intact skulls (36%). This condition was recorded at Kirkhill Cemetery; but not recorded at the 1991 excavations (Cardy 1997 b). The relevance of this condition is unclear, although the presence of wormian bones in the lambdoid suture has been attributed to environmental stress factors (Brothwell 1981, 93).

Another cranial variant, the retained metopic suture, occurred in five (36%) of the intact skulls. This suture, occurring in the middle of the frontal bone usually disappears in infancy, but can continue into adulthood in as much as 10% of the population (Brothwell 1981, 92–3). There appears to be no sexual bias. Retained metopic sutures may be associated with anaemia in childhood (Bruce et al 1997), while others consider they are simply a genetic trait (Brothwell 1981, 93).

There may be some connection between bathrocephaly and retained metopic sutures; two individuals had both. However, three individuals with occipital buns did not have retained metopic sutures and three individuals with metopic sutures did not have bathrocephalic skulls. Both brachycephaly and retained metopic sutures have been claimed to be associated with skeletal stress or anaemia (see above). In the case of the examined individuals of the eight who had either one or both conditions, six displayed cranial pitting and three of these also showed evidence of hypoplasia. It is clear therefore that most of the affected individuals do show signs of stress during childhood. It may be relevant that in two cases where the occipital shelves were less pronounced, no cranial pitting or dental hypoplasia were present. Wormian bones in the lambdoid suture have also been associated with environmental stress. A further two individuals had wormian bones unassociated with an occipital bun, of which one also had pitting of the cranial furnace and orbits, although the latter had none.

A high level of pathological lesions was noted from the skeletons (Table 3). No unambiguous pathological lesions were noted on infants and children. Both infants had slight pitting on external bone surfaces but this may simply have been normal apposition of bone and not pathological. These individuals presumably died from acute infectious diseases, which would leave no trace on the skeleton.

Of the 20 adults and adolescents, all but one displayed pathological lesions, with most being affected by more than one type of disease. One individual had signs of congenital, metabolic, joint and dental disease and also had traumatic injuries.

Table 3 Presence of disease amongst the skeletal assemblage recovered from the graveyard of the Holy Trinity, St Andrews, Fife.

type of pathological lesion	number of individuals
dental	15
joint	10
metabolic	12
infectious	5
congenital	1
trauma	9

Dental disease

Dental disease was the most commonly occurring disease. All but two of the 17 adults examined had poor dental health, ie, 88% of adults or 56% of the total individuals examined. None of the children had diseased teeth but one of the adolescents had an infected tooth that seems to have originated from a traumatic injury. The form of dental disease was often varied and severe. Ten individuals had carious lesions, ten individuals had lost teeth during life, six had dental abscesses, some of which were severe enough to pierce bone, and four suffered from an advanced degree of periodontal disease.

From the information provided by Roberts and Cox (2003) for the late medieval period in Britain the caries rate per individual was extremely varied, with an overall prevalence rate of 53%.

The number of teeth lost during life is high. Of the total number of permanent tooth places (485, which includes all tooth places whether the teeth were in situ, loose, lost *post mortem*, or lost *in vivo*), 101, or 20.8% had been already lost by the time of death. The average for tooth position for Britain in the late medieval period was 19% (Roberts and Cox 2003, 263), very similar to that from St Andrews Library. Similarly, the number of individuals affected from this study was 37% (10 of 27 individuals), while the average number of affected individuals from British sites was 36%.

Many teeth were found to be chipped, particularly the occlusal edges of anterior teeth. Polishing of the damaged edges, recorded on five individuals, indicates that the damage must have occurred during life. In the case of one adolescent male the injury was so great as to have exposed the root canal, allowing bacteria to enter the root canal and an abscess to occur.

Joint disease

Joint disease was present on ten individuals. This category includes degeneration of the spine as well as lesions at the major joints such as the hips, shoulders, knees and ankles and the smaller joints at the hands and feet. This is largely a disease of old age and of the ten individuals, six were middle-aged and four were old adults. The most commonly affected sites were the back (10 cases), hands (4), shoulder (3), elbow (2), feet (2) and hips (2).

Metabolic disease

Included in this category are the numerous cases of cranial and orbital pitting, thought to indicate the presence of iron deficiency anaemia during childhood. All of the individuals concerned were adults but as the condition is thought to be only active during childhood, what is visible are the partially-healed lesions. There were ten cases noted. Also included, although not disease *per se*, are hypoplastic lesions of the teeth. These disruptions to dental enamel occur during

periods of illness or malnutrition in childhood when growth ceases in order to allow the body to recover. As a result, a permanent marker is left on the teeth. Five individuals had dental hypoplasia, most having several lesions indicating numerous such periods during childhood.

Infectious disease

Most cases of infectious disease leave no trace on the skeleton. Most of these are short-lived and often fatal. A few chronic forms of infectious disease, however, can cause bony changes. Five cases of possible infectious disease were identified. In one adolescent male the fibulae were thickened, the right showing evidence of pus formation. Periosteal bony changes accompanied by erosive lesions indicated the involvement of ankle and foot bones. The cause of these pathological changes is not entirely clear. Possible diagnoses are haematogenous osteomyelitis, (bacterial infection), which tends to be more common in children than infants or adults (Ortner 2003), skeletal tuberculosis and congenital syphilis. As this disease was quite active, it was most likely the cause of death. Another adolescent male may also have had some form of infectious disease although less serious. This took the form of non-specific periosteal reaction on both tibiae.

A third individual, a young adult female, had very unusual lesions of the spine. These reddish lesions were associated with uneven bony changes in the form of alternating pits and furrows on the body surfaces of most of the thoracic and lumbar vertebrae. The changes were more marked towards the lower thoracic and upper lumbar areas. The cause of these changes remains unclear, but may be related to infectious disease.

The fourth example had osteomyelitis of a finger bone (proximal phalanx) which appears to be a localised bacterial infection resulting from a traumatic injury. The final case is that of a middle-aged male where the inferior parts of both femurs and tibiae and fibulae were thickened and periosteal reaction was present over the swollen areas. Most of the foot bones had periostitis and erosive lesions, as did some ribs and the sternum. This could be a case of syphilis, although as the skull is missing, it is not possible to be certain.

Congenital disease

There was only one possible case of congenital disease: that of a young adult female where the frontal bone was extremely low and sloping, there was a dip across both parietals just posterior to the coronal suture and a bulging posterior cranium. This may be pathological in origin, possibly indicating congenital idiocy.

Trauma

Nine individuals had traumatic lesions. Six of the individuals were male, two were female and one was of unknown sex. In most cases multiple injuries had

occurred. These consisted of various healed fractures of the clavicle, ribs, hand and foot bones and spine. Interestingly there were no fractures of the limb bones. Ligamentous injuries, often associated with fractures, were also common.

Medieval pottery

Naomi Crowley

The excavation produced 400 sherds of pottery which were examined and recorded by context, fabric, form and number of sherds, noting manufacturing techniques and surface treatments such as glazing or applied decoration.

Scottish White Gritty Ware

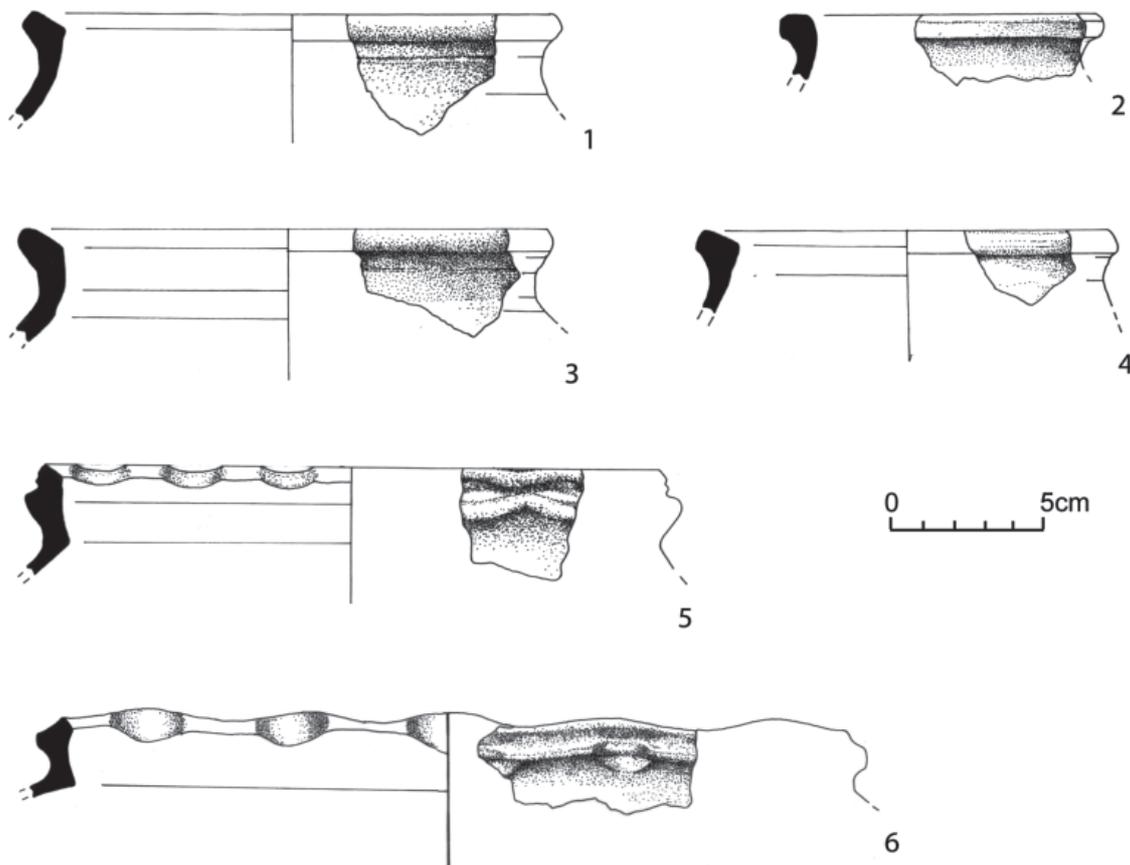
The assemblage is dominated by pottery in this fabric, as are most assemblages from excavations in St Andrews. This is a hard light-coloured fabric, varying in colour from pink to white to grey, and contains frequent rounded quartz inclusions. Recent work has identified three potential production centres within the area currently occupied by the Lothians, Scottish Borders and Fife; although the White Gritty Ware Sourcing

Project suggests that the kilns were far more widespread (Jones et al 2006). Production is dated from the 12th to the 15th century after which this ceramic tradition appears to disappear.

The graveyard soils (004, 008 and 067) produced 357 sherds of White Gritty Ware, mostly from glazed jugs (Illus 4, 1–6). Types of decoration present include applied iron oxide slip strip decoration, decorated cordons, incised straight vertical and horizontal lines, a thumbled base, and three sherds from the incised beard of a face mask jug. Some 35 sherds come from cooking pots, most exhibiting sooted external surfaces, with two frilled bifid rims present (Illus 4, 5 and 6). This distinctive type of rim appears to be a product of the Fife industry (Hall 1997).

French wares

The graveyard soils produced five body sherds from vessels that may be French in origin with a possible 13th or 14th century date. Two sherds from the graveyard soil (004) are in a fine white fabric with a light green glaze mottled with a darker green. The lower graveyard fill (067) contained three sherds in a fine white fabric, two with a dark green glaze. One sherd also has an applied stamped medallion.



Illus 4 Selected domestic pottery recovered during excavations: 1–4 Context No 067, Find No 346, 5 Context No 004, Find No 271, 6 Context No 004, Find No 227.

Yorkshire Type Wares

Graveyard soil (008) produced one jug body sherd in a red fabric with a dark green glaze that has affinities to material with a suggested origin in Scarborough. This probably dates to the late 13th or early 14th centuries (Farmer 1979).

A further four body sherds from medieval green glazed jugs are of unprovenanced Yorkshire Types.

Rhenish Stonewares

These hard-fired imported fabrics began to arrive in Scotland during the 14th and 15th centuries (Hurst et al 1986). All three sherds are from the graveyard soils (004 and 008). There are two sherds from Langerwehe and one from Sieburg.

Low Countries Greyware

Graveyard soil (004) produced one sherd of this fabric, dating from the mid-late 12th century to the mid 14th century.

North European Earthenwares

This fabric was imported from Northern Europe, probably Holland, from the 16th century onwards and appears on coastal Scottish sites. Graveyard soils (004) and (067) produced six small glazed sherds in this fabric.

Scottish Post-Medieval Reduced Ware

The lower graveyard soil (067) produced two jug sherds of this grey coloured glazed fabric. This fabric replaced White Gritty Ware during the late 15th and early 16th centuries and continued to be produced up to the 18th century.

Building material

Naomi Crowley

The excavation produced fragments of two types of ceramic roof tile and one fragment of floor tile.

Roof tile

The graveyard soils (004, 008 and 067) contained 17 fragments of roof tile in a sandy light red coloured fabric containing lighter clay streaks and red iron oxide inclusions. Most of the fragments were from flat tiles between 10 to 12mm thick, although the fragments were too small or had no diagnostic features to identify whether they had nibs or peg holes for fixing to the roof. Most of them had a red slip on their surface to make them appear to be redder in colour. Two fragments are from curved ridge tiles, one with a green glaze on the

surface. It is likely that these roof tiles are medieval. The homogenised graveyard soil (004) contained a fragment of pantile in a fine red fabric dating from the 18th to the 20th century.

Floor tile

Context 009 contained a small fragment of unglazed floor tile in a fine red fabric, 22mm thick, dating to the post-medieval period.

Metallurgical ceramics and waste

Effie Photos-Jones

Metallurgical ceramics

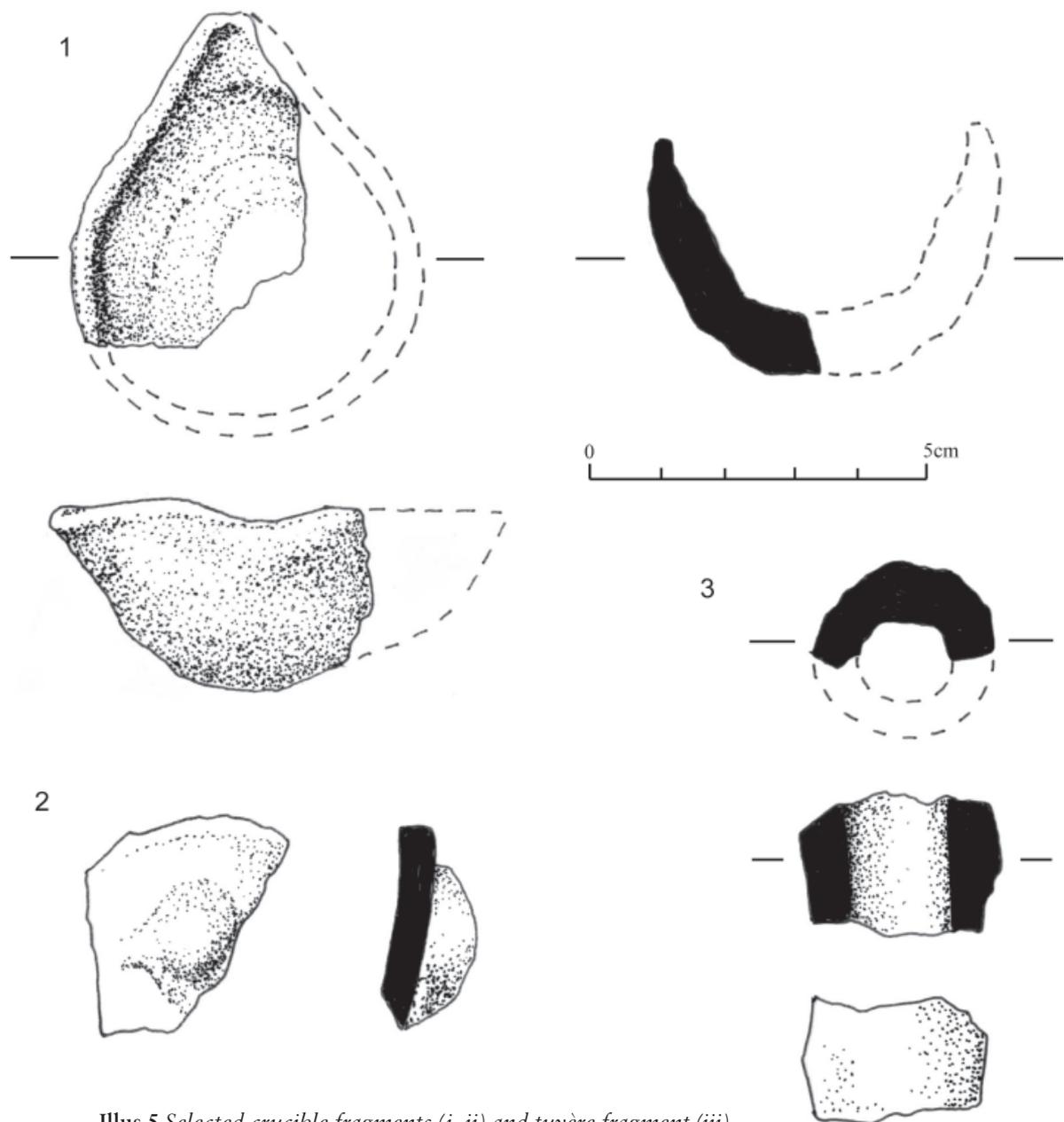
Some 22 fragments from multiple small crucibles were recovered from the homogenised graveyard soil (004 and 008). The vast majority of these were recovered from this sediment immediately overlying the pebble layer (077). The fragments were of body, rim or base crucible sherds (Illus 5, 1 and 2). There are two distinct crucible shapes: one square-bottomed and shallow, the other deeper and probably conical-bottomed. One body fragment carries a 'knob' which has vitrified. Some body fragments are misshapen, with a 'wobbly' surface, and cracked as a result of over-heating. The crucibles must have been prepared to order and first fired upon use. Vitrification is evident both internally and externally. One sherd of partially-vitrified metallurgical ceramic incorporated fragments of quartz.

From the same concentration of crucible fragments within (004) a small fragment of a tuyere or blowpipe was recovered (Illus 5, 3). Internal diameter does not exceed 10mm. Thickness of wall is 8mm. The fragment shows no signs of vitrification either internally or externally; the interior surface is very smooth, the exterior less so.

A further 41 fragments of multiple small crucibles were recovered, interspersed within the pebble layer (077) which overlay one of the sand deposits (021). The crucibles were small, ranging from 30mm to less than 10mm in diameter, and showed varying degrees of 'slagging', namely reaction of the crucible fabric either with the contents of the crucible (fuel and metal) or vitrification of the exterior walls as a result of reaction with the fuel ash. The majority of the crucible fragments are thin wall fragments (less than 5mm in thickness); with only two belonging to thicker bottom fragments, which are discussed below.

Metallurgical waste

Metallurgical waste was characterised on the basis of visual examination with a low power microscope followed by, when appropriate, chemical/mineralogical analysis. Chemical analysis has been carried out with the electron microprobe (EPMA) while additional high



Illus 5 Selected crucible fragments (i, ii) and tuyère fragment (iii).

magnification imaging has taken place with the scanning electron microscope (SEM-EDAX); mineralogical identification was carried out with the X-ray Diffractometer with a CuK α source.

The materials recovered suggest that the metal working activities identified here took place in situ. The assemblage revealed a wide range of metal making and working practices both in ferrous and non-ferrous metals and included potentially precious metals refining.

The material within the homogenised graveyard soil (004/008) is diverse; comprising nails, vitrified fuel ash and fragments of coal. A small fragment of bloomery (smelting) slag amidst the metallurgical waste suggests that iron smelting was taking place in the immediate vicinity or that it was brought in as a fill for the graveyard earth.

Evidence for primary iron making practices like bloom-making and perhaps even copper smelting together with natural ferrous materials (originally ore?) seem to concentrate in the graveyard soil (004). In contrast the material from the pebble layer (077) and lower graveyard soil (067) reflect non-ferrous metal working and silver refining.

Discussion

Post-graveyard encroachment

The graveyard is likely to have fallen out of use around 1600, although probably in the 1600 to 1620 period rather than 1560 as previously suggested. After this

time, it is inferred from cartographic records that the graveyard was subsequently overwhelmed by the rapid expansion of the burgh.

The structure now used as the public library is known to have been constructed around 1811 as a school. It was later used as the City Hall before being converted into the public library. The walls (003) identified cutting into the upper surface of the graveyard soil are thought to relate to the existing standing building, as they correlate well with walls featured on the internal plan shown on the 1st edition of the Ordnance Survey map dating from 1854.

The graveyard

The excavations took place in a portion of the graveyard likely to have been active from 1410 (possibly 1412 when Holy Trinity Church was completed) to 1600 (possibly as late as 1620). During this period, the graveyard would have been the principal burial site for the dead of the burgh. The area excavated lies within the northern portion of the graveyard as formed by the 1410 gift of land to the church, as opposed to the 1430 expansion to the W.

The high volume of skeletal material recovered from such a limited area (3m by 3m) contrasts with the conclusion reached during earlier excavations that 'the cemetery was used less intensively further away from the western porch' (Cardy 1997b, 155). The scarcity of skeletal material encountered within these earlier service trenches, excavated outside the library, may be related to the survival of the graveyard soil. The heights for the skeletal material recovered from the excavation ranged from 21.17m to 20.17m OD. In contrast, the external surface to the immediate south in Logies Lane / Church Square is at 21.29m OD. The 0.1m depth between road surface and potential skeletal material may suggest that the graveyard in this area was truncated during early 19th century development. By contrast, the 1m full depth of skeletal-bearing graveyard soil within the library may have been protected by the construction of the building in the early 19th century.

The homogeneity of the graveyard soil and the lack of distinguishable grave cuts suggests a high degree ofurbation resulting from the intensive use of the graveyard. The close proximity of the skeletons, both vertically and laterally, also reflects the high density of use. It was frequently noted that the skeletal material from different individual articulated skeletons physically touched. This need not be taken as evidence of multiple inhumations in a single grave; instead, it might imply the use of shrouds in a cramped graveyard where the excavation of a new grave ceased once a dense concentration of human skeletal material was exposed. A vertical sequence of at least eight inhumations can be identified, covering a 1m depth of graveyard soil.

No evidence was noted for the use of coffins, and no shroud pins were recovered. However, there is evidence that shrouds were used; the limbs of individual corpses

appear to have been tightly bound, with the feet bones commonly surviving as a vertical stack of bones.

The burgh population

Although only a small number of individuals have had an osteological examination this has revealed a great deal of information on the health and lifestyle of this group.

Most individuals suffered from numerous physical complaints, and while most of the diseases identified were not life-threatening, they must indicate a poor quality of life. Small stature, early age at death and the evidence for stress during childhood are all suggestive of poor living conditions and probably also an inadequate diet. Appalling dental hygiene, numerous caries and dental abscesses as well as arthritic joints all suggest that severe pain was common. The frequency of traumatic lesions is probably related to an arduous working environment, and the number of individuals with chipping of the anterior teeth also suggests an occupational link.

Construction debris

The stone rubble towards the base of the graveyard soil appears to have prevented the grave diggers from exploiting the full depth of the available soft sediment, and hence increasing the density of skeletal material in the upper graveyard soil. The rubble and sand encountered was likely to be associated with the construction or demolition of a substantive stone building prior to the use of the graveyard. The rubble fragments were sandstone and while medium-sized stones were present, it was generally represented by small fragments, none of which appear to have been sculpted.

The use of stone in the construction of buildings prior to 1410 is unusual within a burgh, and typically would be limited to church buildings and wealthy merchants. Given the location of the excavation, in the mid-point of a rig that did not front onto a vennel or wynd, it can be argued that the concentration of rubble and sand encountered here seems most likely to relate to the construction of the Holy Trinity Church, though an alternative origin can be postulated (see Metallurgy below).

Metallurgy

The presence of industrial ceramics, slag and fuel suggests that the construction noted above also involved metal fittings or furnishings of some kind. The most obvious option would be that this debris derived from the fitting-out of the Holy Trinity Church, although an association with other urban structures remains a possibility.

It seems clear that the metalworking activities pre-date the use of the graveyard. Since iron tools would

have been needed for the construction of the church, it is likely that some iron smelting/smithing (008) was carried out 'on the premises'. However, silver refining and copper smelting may reflect other interests. It is possible that the building debris discussed above was associated with the construction or demolition of a substantive stone building, perhaps part of a workshop involved in activities which would have been regulated by the church or other authorities, with the intent of raising funds for the construction of public buildings, religious or secular.

Medieval pottery

The assemblage is typical of those found on other excavations throughout St Andrews, with Scottish White Gritty Ware dominating. There was recovered, in addition, a small quantity of imported wares from England and the continent. The majority of the pottery from all the graveyard fills pre-dates the building of the church of the Holy Trinity Church and the use of the graveyard, even though the excavation did not produce evidence for occupation prior to the building of the church. Previous excavations in the cemetery have also produced pre-cemetery dated pottery (Cheer 1997). Only a small assemblage of pottery dates to the late 15th/16th century, a period contemporary with the use of the cemetery.

Pre-construction activity

Although the ground lies within the early medieval burgh, there were no identified features pre-dating the construction horizon. The absence of such features in this small area cannot be taken as suggestive or indicative of much, though it may indicate that at this time, this portion of the burgh plot was subject to low-intensity horticultural use or even disused.

This contrasts with the suggestion from the records of the renovation of the Holy Trinity (Henry 1912, Simpson and Stevenson 1981) that the church overlay the site of an orchard. Equally, studies associated with other excavations within the graveyard, particularly in proximity to South Street, have identified structures and pits pre-dating the arrival of the church (Mackenzie and Moloney 1997). The dating of the latter should be viewed with some caution, given that these excavations were within the rig acquired in 1430, 20 years after the construction of the Holy Trinity Church.

Conclusion

The majority of the sediments excavated were from the graveyard, with elements of some 70 articulated skeletons lifted as well as quantities of disarticulated human skeletal material and artefacts. One distinct horizon that was noted towards the base of the homogenised graveyard earth appeared to be

construction debris. This included a considerable quantity of industrial ceramics, slag and charcoal.

The whole of the lift shaft pit was excavated to natural sand sediments and all human skeletal material removed from this area. The underpin trenches were cleared to the depth necessary to facilitate the underpinning of the gable wall.

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References

- Ainslie 1745 *County of Fife*.
 Anon 1920 *The Parish Church of the Holy Trinity, St Andrews*, Edinburgh.
 Bass, W M 1995 *Human Osteology a Laboratory and Field Manual*. Fourth Edition. Missouri: Missouri Archaeological Society.
 Buikstra, J E and Ubelaker, DH 1994 *Standards for Data Collection from Human Skeletal Remains: Proceeding of a Seminar at the Field Museum of Natural History Organised by Jonathan Hass*. Arkansas Archaeological Survey Research Series No 44 Fayetteville. Arkansas.
 Brothwell, D R 1981 *Digging up Bones*. Oxford University Press.
 Bruce, M F and Cross, JF 1989 The skeletal remains. In J A Stones (ed), *Three Scottish Carmelite Friaries: Excavations at Aberdeen, Linlithgow, and Perth 1980–1986*. (=Soc Antiq Scot, Monogr Ser 6) Edinburgh.
 Bruce, M F, Cross, J F and Kerr, N W 1997 Human Remains. In M J Rains and D W Hall (eds): *Excavations in St Andrews 1980–1989. A Decade of Work in a Scottish Burgh*. Glenrothes, (=Tayside Fife Archaeol Committee, Monogr 1, 118–31.)
 Cardy, A 1997a The human bones, in P Hill, *Whithorn and St Ninian*. The Whithorn Trust. Sutton Publishing.
 Cardy, A 1997b The human skeletal remains. In J R Mackenzie and C J Maloney. *Medieval Development and the Cemetery of the Church of the Holy Trinity*, Logies Lane, St Andrews. *Tayside Fife Archaeol J* 3 (1997).
 Cheer, P 1997 'The pottery' in Medieval development and the cemetery of the Church of the Holy Trinity,

- Logies Lane, St Andrews. *Tayside Fife Archaeol J 3* (1997), 143–160.
- Farmer, P G 1979 *An introduction to Scarborough ware and a reassessment of knight jugs*. Privately published monograph.
- Fazekas, I G and Koza, F 1978 *Forensic Fetal Osteology*. Budapest: Academica Kiado.
- Geddy, J 1580 Plan of St Andrews.
- Hall, DW 1997 'The pottery' in Rains, M J and Hall, D W (eds) *Excavations in St Andrews 1980–89: a decade of archaeology*. (40–63) (=Tayside Fife Archaeol Committee Monogr 1).
- Hall, D W 2003 'Medieval pottery from the Overgate, Dundee', *Tayside Fife Archaeol J 9* (2003), 88–95.
- Henry, D 1912 *The Knights of St John with Other Mediaeval Institutions and Their Buildings in St Andrews*. St Andrews,
- Hurst et al 1986 Hurst, J, Neal D S, Van Beuningen, H J E *Pottery Produced and Traded in North-West Europe 1350–1650*, Rotterdam Papers VI.
- Jones, R, Will, R, Haggerty, G and Hall, D W 2006 'Sourcing Scottish White Gritty ware' *Medieval Ceramics Volume 25/27* (2003), 45–84.
- Kennedy, K A R, 1989. Skeletal markers of occupational stress. In L_{can}, M Y and K A R Kennedy (eds) *Reconstruction of Life from the Skeleton*. Wiley-Liss, Inc. New York
- Kerr, N W, Bruce, M F and Cross, J F 1988. Caries experience in the permanent dentition of Late Medieval Scots (1300–1600 A.D.) *Archives of Oral Biology*. Vol. 33. pp 143–148
- Lunt, D A and M E Watt, 1997. The Human Dentitions. In P Hill. *Whithorn and St Ninian*. The Whithorn Trust. Sutton Publishing
- Mackenzie, J R and Moloney, C J 1997 'Medieval development and the cemetery of the Church of the Holy Trinity, Logies Lane, St Andrews' *Tayside Fife Archaeol J 3* (1997), 143–160.
- Mays, S, 1998. *The Archaeology of Human Bones*. Routledge. London and New York.
- Miles, A E W, 1989. *An Early Christian Chapel and Burial Ground on the Isle of Ensay, Outer Hebrides, Scotland with a Study of the Skeletal Remains*. Oxford (=BAR British Series 212).
- Mitchell, J F and Mitchell, S 1971 *Monumental Inscriptions (pre-1855) in East Fife*, Unpublished archive report.
- Ordnance Survey 1854 1st edition map.
- Ordnance Survey 1893 2nd edition map.
- Ortner, D J, 2003. *Identification of Pathological Conditions in Human Skeletal Remains*. Second Edition. Academic Press.
- Rankin, W E K 1955 *The Parish Church of the Holy Trinity, St Andrews*, Edinburgh.
- Roberts, C and Cox, M 2003. *Health and Disease in Britain from Prehistory to the Present Day*. Sutton Publishing. Stroud, Gloucestershire.
- Roberts, C and Manchester, K 1995. *The Archaeology of Disease*. Second edition. Alan Sutton Publishing Limited. Cornell University Press. Ithaca, New York.
- Russell Walker, J 1888 *Pre-Reformation Churches in Fife and the Lothians, Vol 1 Fifeshire*, Edinburgh.
- Scheuer, L and Black, S 2004. *The Juvenile Skeleton*. Elsevier Academic Press. London and San Diego.
- Simpson, A T and Stevenson, S 1981 *Historic St Andrews*, Scottish Burgh Survey.
- Spalding, R N, Sinclair, D J, Cox, A and Morley, K D 1996. 'Dry bones: a palaeopathological study of skeletal remains from a Medieval graveyard in Dundee'. *Scottish Medical Journal*; 41: 56–59
- van Beek, G C, 1983. *Dental Morphology: an Illustrated Guide*. Wright: Bristol.
- White, T D and Folkens, P A 2000. *Human Osteology*. Second Edition. Academic Press.
- Wood, John 1820 Plan of the city of St Andrews.

Abstract

The excavations within the public library in St Andrews lifted 76 articulated human skeletons and significant quantities of disarticulated skeletal material from the graveyard of the parish church of the Holy Trinity. The graveyard is known to have been active between circa 1410 and 1600.

A horizon of construction material, including industrial ceramics and slags, was identified pre-dating the graveyard soil. The origin of these materials is uncertain, though they may well derive from the construction of the parish church of the Holy Trinity in 1400.

Keywords

graveyard
medieval
St Andrews

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