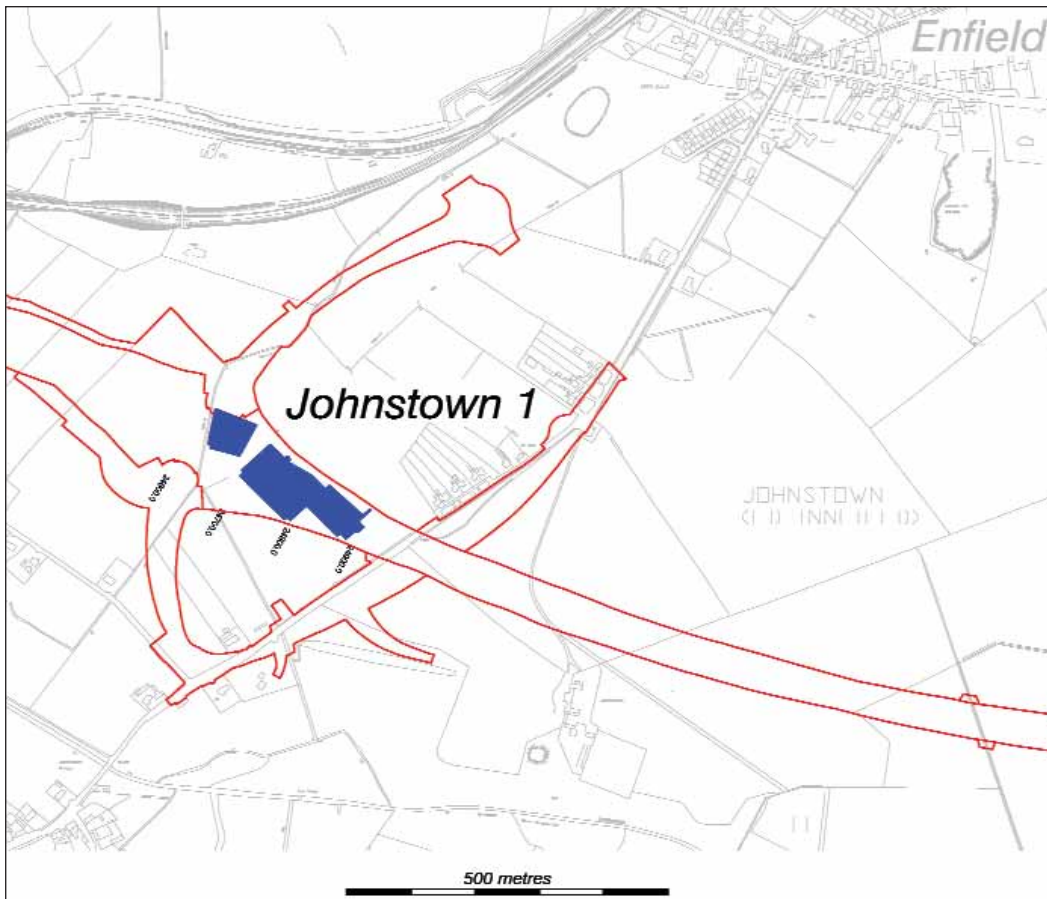


10. Minor ailments, furious fights and deadly diseases: investigating life in Johnstown, County Meath, AD 400–1700

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Illus. 1—Location map showing excavated areas at Johnstown 1 (Archaeological Consultancy Services Ltd, based on the Ordnance Survey Ireland map)

Skeletons are considered to be unequivocal symbols of death, but the scientific analysis of human skeletal remains from archaeological excavations offers unique and extremely valuable insights into the lives of past populations. Excavations in the townland of Johnstown, Co. Meath, were carried out between April and October 2002 by Archaeological Consultancy Services Ltd on behalf of Westmeath County Council in advance of construction of the M4 Kinnegad–Enfield–Kilcock road scheme¹ (Illus. 1 and 2). The excavations uncovered an extensive burial ground that had been in virtually uninterrupted use for a period of almost 1,500 years (Clarke 2002). The osteological analysis of over 400 skeletons from Johnstown revealed evidence for hardship, accidents,

¹ NGR 27698, 24047. Height 76.31 m OD. Excavation Licence No. 02E0462.



Illus. 2—Aerial view of Johnstown 1 (Archaeological Consultancy Services Ltd)

conflict and disease—demonstrating the possibilities as well as the limitations of skeletal analysis, while offering enormous potential for advancing our knowledge of the health and lifestyle of people in the past.

Osteological analysis

During seven months of excavation at Johnstown, a total of 461 human skeletons were excavated and recorded. Excavation, however, only presents the first part of the process that is eventually to result in a comprehensive report on the finds and features discovered through archaeological works. In the case of the Johnstown human remains, all skeletons needed to be carefully cleaned and catalogued before osteological analysis could commence. The analysis itself, which took over seven months to complete, involved a number of tasks. Initially, each skeleton was laid out in anatomical position, an inventory of all bones present was completed and a number of standard measurements of the bones were taken. This was followed by an assessment of age and sex, based on the developmental stages, size and shape of bones and teeth. Once this basic biological data had been recorded, each skeleton was examined for the presence of anatomical anomalies and signs of disease or injury. It is important to note that not all diseases leave their mark on the skeleton. Those that do are generally chronic conditions which an individual survived for months or even years, or traumatic injuries to the bone that can be caused either by accidents or by armed conflict and intentional violence. In addition, the chronological age of a number of skeletons was established through radiocarbon dating (Table 1, here, and Appendix 1, below). A catalogue of all skeletons was then produced, including all of the above data, as well as information on burial position, associated finds and any evidence for grave-markers or coffins.

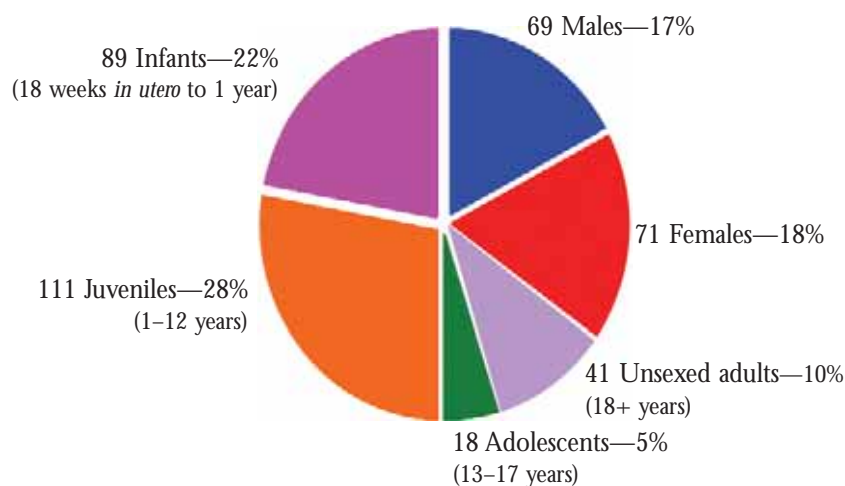
Table 1—Skeletal radiocarbon dates

Burial No.	Age	Sex	Calibrated radiocarbon date
Burial 25	18-25 years	Male	AD 580-700
Burial 26	Adult	Male	AD 880-1010
Burial 33	36-45 years	Female	AD 430-680
Burial 34	36-45 years	Male	AD 680-890
Burial 42	36-45 years	Male	AD 545-700
Burial 68	4-5 years	—	AD 1500-1665
Burial 110	45+ years	Female	AD 370-640
Burial 118	18-25 years	Female	AD 1170-1290
Burial 128	45+ years	Male	AD 680-890
Burial 129	Charnel Deposit		AD 370-640
Burial 142	36-45 years	Male	AD 1190-1290
Burial 145	18-25 years	Male	AD 1230-1300
Burial 166	36-45 years	Female	AD 650-900
Burial 196	14-17 years	—	AD 1225-1410
Burial 219	Adult	—	AD 530-660
Burial 222	5-6 years	—	AD 1290-1410
Burial 249	18-25 years	Female	AD 680-980
Burial 269	18-25 years	Male	AD 990-1255
Burial 280	36-45 years	Male	AD 1060-1280
Burial 295	26-35 years	Female	AD 1290-1440
Burial 370	4-5 years	—	AD 1230-1300
Burial 485	26-35 years	Female	AD 1160-1300

Once information on each skeleton was available, the osteological data was analysed at the group or population level to establish the proportion of different age groups present at Johnstown, the ratio of males versus females, mean adult stature and overall frequencies of diseases and injuries present. Where possible, these results were compared with other Irish skeletal assemblages. It is important to remember, though, that, as a rule, skeletal assemblages only represent a sample of any given living population, as it is likely that not everybody in that population would have been buried in the one place. In addition, the burial ground at Johnstown was used over a considerable length of time and thus included individuals from different archaeological periods. Despite these limitations, the osteological analysis of the skeletons offered important insights into life and death at Johnstown in the past.

Facts and figures

Of the 461 burials excavated, 399 were contained within a large enclosure, and radiocarbon dates attained from the bones of selected skeletons established a 5th to 17th-century date range for the use of this part of the cemetery (Table 1). On stratigraphic grounds, these skeletons could be broadly sub-divided into a medieval group of 346 individuals and a post-medieval group of 53 individuals. A further 62 burials from outside the enclosure dated to



Illus. 3—Johnstown 1 enclosure burials: age and sex distribution

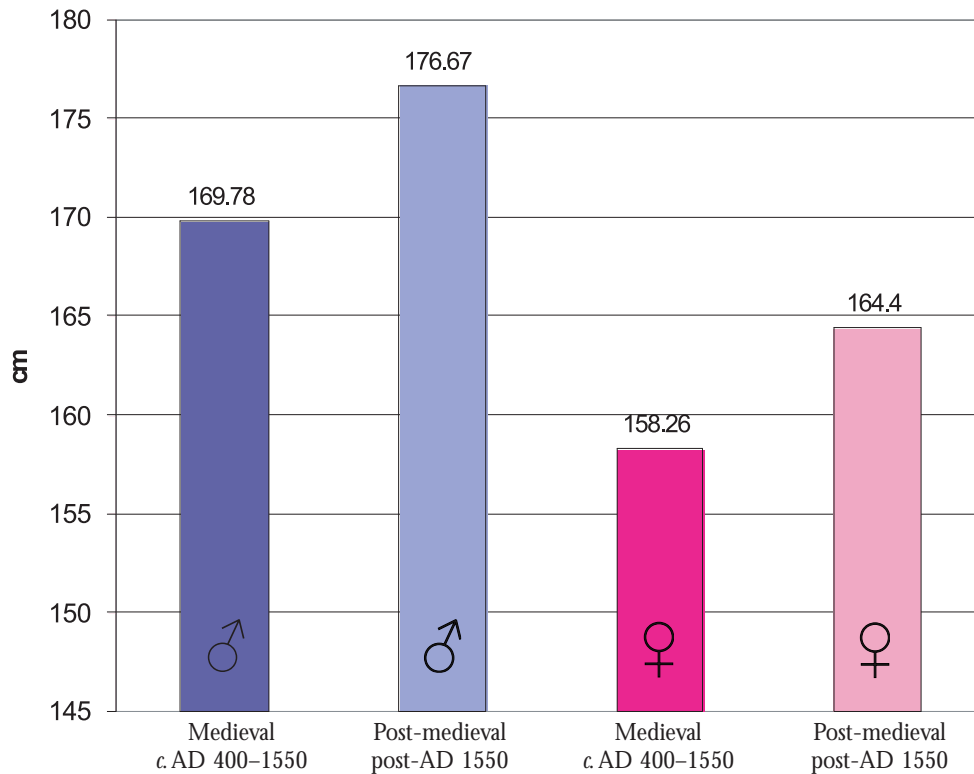
the 19th and early 20th century, and were part of a *cillín*, a burial ground for unbaptised infants. This latter group of skeletons, consisting almost exclusively of infants that had been born prematurely or died close to the time of birth, represented a very different episode of burial at Johnstown. The focus of this article will be on the enclosure burials of medieval and post-medieval date.

Of the 399 individuals excavated within the enclosure, a total of 50% were infants and children under 13 years of age, whereas the adult group appeared to contain an almost equal number of men and women (Illus. 3). The high number of children in the assemblage is a reflection of the relatively high infant and child mortality rates of the period, which were probably as high as 30%. Pregnancy, birth and the early post-natal period were hazardous times for mother and child, and early childhood presented more risks for the growing individual through a number of common childhood diseases. This is emphasised by the fact that over 80% of individuals who died before the age of 13 did not live beyond their eighth year, with 55% dying between the ages of four and eight years.

Looking at the physical characteristics of the adult population at Johnstown, stature calculations for males and females indicated an increase in adult stature between the medieval and post-medieval period (Illus. 4). This is a trend observed throughout most of Europe for this period, and is conventionally related to improved living conditions, which can include, for example, improved housing, diet and working conditions.

Minor ailments?

The following section is going to introduce a number of diseases and disorders that would generally not have been fatal and were relatively common and probably quite familiar to people. Although most of the conditions would have involved a degree of pain or discomfort,



Illus. 4—Johnstown 1 enclosure burials: medieval and post-medieval adult stature

it is likely that the affected individual just had to ‘get on with it’ and live with the symptoms, as general health care and methods of treatment were relatively limited at the time.

Dental disease

One of the most common conditions noted on the remains was dental disease, and overall dental health was rather poor at Johnstown. Almost half of all adult individuals suffered from dental abscesses or had lost one or more teeth during life. Abscesses are caused by pus-producing bacteria and can be extremely unpleasant and painful. In the course of the infection, pus starts to build up and results in painful pressure on the tooth. This increasing pressure also affects the surrounding bone and eventually a hole (*sinus*) develops, which allows the pus to drain out. Another 35% of adults were affected by caries defects, ranging from discolorations to large cavities in the affected tooth. Like abscesses, caries is the result of bacterial action. In this case, the bacteria ferment sugars and as a by-product create acids which demineralise and damage the tooth. The risk of developing caries is also increased by the presence of calculus. Calculus is essentially calcified plaque, incorporating micro-organisms, saliva and food debris, and substantial deposits can result in inflammation of the gums and thus affect dental health.

One of the dental conditions recorded at Johnstown was an impacted third molar or ‘wisdom tooth’ (Illus. 5). Whereas today an awkwardly growing wisdom tooth would be removed through surgical intervention, this individual would have simply had to endure any pain or discomfort caused by the horizontal, rather than vertical, position of this third molar in the jaw. Alternatively, the wrong tooth might have been extracted to relieve the



Illus. 5—Burial 134, adult male with impacted third molar (Archaeological Consultancy Services Ltd)



Illus. 6—Burial 10, older adult male with osteoarthritis of the right wrist. Note porosity and eburnation (Archaeological Consultancy Services Ltd)

pain as the wisdom tooth, the actual source of the problem, would have been covered by the gums and not been visible.

Degenerative joint disease

Another commonly recorded condition at Johnstown was degenerative joint disease, which is age related to a large extent and the result of general wear and tear of joints throughout life. The joint cartilage, which during life acts as a kind of cushion between the bony elements of the joint, gets increasingly worn, and early stages of joint disease are characterised by the porous appearance of the bone or bony lipping around the joint margin (osteophytosis). The advanced stage of degenerative joint disease, osteoarthritis, results in actual bone-to-bone contact once the cartilage has worn away completely. If this happens, shiny, polished areas (eburnation) can be observed on the joint surfaces where the bones were rubbing against each other (Illus. 6). Almost half the adults at Johnstown, and not only those of advanced age, were affected by degenerative joint disease to some degree, indicating a relatively high degree of physical activity in the population.

Fractures and dislocations

A total of 29 fractures were observed at Johnstown, affecting approximately 10% of the population older than 1 year. This number is neither particularly high nor particularly low when compared with other skeletal assemblages. All of the cases appeared to have been genuinely accidental or activity-related injuries and included broken arms, ankles and ribs. Also present was an individual with a dislocated shoulder. The upper arm had been dislocated towards the front of the body and, although it is relatively easy, if painful, to push the arm back into its joint socket, this did not happen in the present case. The arm remained in its dislocated position and formed a new joint on the anterior part of the shoulder blade (Illus. 7), probably resulting in impinged nerves or muscles, as well as restricted movement.

A rare find

One miscellaneous condition diagnosed at Johnstown is worth noting, if only for the fact that it is so rarely recorded in archaeological populations. A gallstone measuring over 2 cm in maximum diameter was found associated with the burial of an older adult male (Illus. 8). It is generally believed that the formation of gallstones is related to high cholesterol levels, and complications can include infection or irritation of the gall bladder. Gallstones do not have to be symptomatic but, if they are, the pain associated with them can be severe and disabling. It is impossible to assess whether the affected individual from Johnstown experienced any pain, but the dimensions of the gallstone are definitely large enough to have caused significant problems.

Furious fights

War and violence was a relatively common feature in medieval and early post-medieval Ireland, and the majority of larger cemetery excavations include at least one individual with skeletal signs of intentional violent injuries. It is rarely possible to attribute these injuries to particular incidences or recorded battles. (A notable exception is the discovery of human remains at Carrickmines Castle, County Dublin, which have been attributed to the siege and final



Illus. 7—Burial 151, adult male with dislocated right shoulder with new shoulder joint on anterior surface of shoulder blade (Archaeological Consultancy Services Ltd)



Illus. 8—Gallstone found with Burial 6 (adult male) (Archaeological Consultancy Services Ltd)



Illus. 9—Burial 142, adult male with healed blunt force injury to the cranium (Archaeological Consultancy Services Ltd)

destruction of the castle.) Although the four cases of intentional injury diagnosed at Johnstown cannot be attributed to any particular event or conflict, they nevertheless constitute powerful reminders of the risks and brutality involved in armed confrontations during the period.

The survivor

One 13th-century adult male had suffered a substantial blunt force injury to the left side of his head (Illus. 9). Amazingly, the fatal-looking injury healed, leaving this man to survive for at least several months, maybe even years. He was left with a deep, sub-rectangular impression where the weapon had hit his skull, though the smoothness of the wound edges indicated its advanced stage of healing. The regular outline of the injury is striking, and although it is not possible to say with certainty what kind of weapon caused the blow, tentative suggestions are possible. These include the rectangular butt end of a battle-axe, a type of which was still commonly used in 13th-century Ireland. Alternatively, the wound could have been caused by the hilt of a sword, possibly wielded by somebody in an elevated position, for example on horseback. Uncertainties about the exact details of the attack remain, but it is likely that the impact of the injury would have had some neurological affect, and disturbance of sensory and perceptual functions are likely.

The victims

Some individuals from Johnstown were not as fortunate and died of their injuries. The following cases paint a vivid picture of brutality and gruesome violence.

One adult male dating to between AD 880–1010, simply had his throat cut from behind in what appears to have been some form of ambush or surprise attack. Multiple cut marks



Illus. 10—Reconstruction drawing of attack on adult male (Burial 26) and detail of cut marks on the second neck vertebra (Sara Nylund & Archaeological Consultancy Services Ltd)

were present on the front of the second neck vertebra (Illus. 10).

Another example of intentional trauma concerns a young adult male who lived in the 13th century and who had suffered 20 different blade injuries. None of the wounds showed any sign of healing, and some of the head injuries were severe enough to result in almost instant death. Of all the cases discussed here, this one seemed most likely to be associated with an actual battle. The injuries affected the shoulder, neck, hand and head of the victim, and some of the skull injuries had sliced through the right eye and severed part of his left cheekbone (Illus. 11). It is clear that the final moments of this man's life must have been quite horrific.

Deadly diseases

Infectious diseases, which are commonly diagnosed in archaeological skeletal assemblages, were another serious health issue in past populations. These can be caused by parasites, fungi or bacteria and transmitted via open wounds, droplets, contaminated food or animals. Over 15% of individuals at Johnstown showed skeletal changes that are probably the result of some kind of infection, and in half of these cases the condition would have been active or acute at the time of death.



Illus. 11—Burial 145, young adult male with blade injuries to right orbit and left cheekbone (Archaeological Consultancy Services Ltd)

Osteomyelitis

One type of infection diagnosed was osteomyelitis, and three cases of the disease were present at Johnstown. Osteomyelitis originates in the bone marrow and is caused by pus-producing bacteria introduced into the bone either via the bloodstream or directly through wounds or open fractures. The original bone is slowly encased in a shell of new bone (*involucrum*) and eventually dies. The dead bone tissue, together with the pus produced by the bacteria, drains through circular openings (*cloacae*) in the new bone and eventually oozes through the skin (Illus. 12). In all three cases at Johnstown, the condition appeared to have been active at the time of death.

Tuberculosis

Another bacterial infection diagnosed at Johnstown was tuberculosis. Tuberculosis can be transmitted between humans through infected droplets, or between animals and humans through contaminated animal products like milk. As tuberculosis is primarily a soft tissue disease, skeletal changes are present in only 3–5% of affected individuals in modern populations. The presence of these skeletal changes in an archaeological population therefore indicates that the actual number of infected individuals in that group was probably much higher, especially since the disease is relatively easy to pass on. Unequivocal diagnosis of tuberculosis on the skeleton can be difficult, however, as other diseases produce similar changes. In the case of pulmonary tuberculosis, affecting the lungs and ribs, pneumonia and other respiratory conditions have to be considered as alternative diagnoses.

One of the cases present at Johnstown was an adult female. The disease had affected the lungs, the lower spine and the sacrum. In addition, a porous depression present in the bones of the forehead indicated that the individual had also suffered from *lupus vulgaris* or soft tissue tuberculosis, which would have resulted in skin ulcers.



Illus. 12—Burial 323, juvenile (7–9 years) with osteomyelitis of the left thigh bone. Note extensive new bone formation (involucrum) and large circular openings (cloacae) (Archaeological Consultancy Services Ltd)

Conclusion

Archaeology is the attempt to reconstruct life in past populations by looking at the material evidence left behind by people. While this evidence, including artefacts and built structures, is immensely important, the physical remains of the people themselves, their skeletons, are still the most direct source of information on life in the past. So what was life like in Johnstown? Infant and child mortality rates were high, and infectious diseases appear to have had a significant influence on population health and mortality rates. Accidents did occur in the course of lives that were physically demanding, and war or inter-personal violence occasionally resulted in loss of life. Although the analysis of the skeletons from Johnstown resulted in a wealth of population-related data, it is important to remember that it also offers a glimpse into the life of over 400 individuals. Some of the smaller ailments as well as the more gruesome cases of chronic disease or sudden, violent death serve as a fitting reminder of the human aspect inherent in any part of the archaeological record which archaeologists try to understand, interpret and present.

Acknowledgements

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