Detecting Disability
An Interdisciplinary Osteoarchaeological Pilot Study Applying the Index of Care to a Romano-British population.

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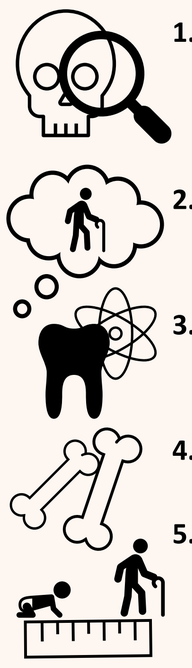
Introduction

- **Inspiration:** Bioarchaeology is increasingly incorporating feminist, queer and disability studies to better understand variation in past human lives.
- **Aims:** To examine quality of life, degree of disability, and access to healthcare for individuals with impairments in 3-4th Century Romano-British Irchester, UK.
- **Approach:** Multiple lines of bioarchaeological and osteoarchaeological evidence within a disability studies framework.

Methodology

The study is divided into five steps:



1. **Macroscopic skeletal analysis**: Demographic data (age, sex, stature)[2,3,4] and paleopathological lesions related to physical impairment (e.g. trauma, joint disease) and chronic illness (e.g. tuberculosis, leprosy).
2. **Index of Care:** macroscopic data will be examined through the IoC framework to reflect on the accommodations an individual would have needed in life[8].
3. **Dietary Isotope Analysis:** Changes in dietary patterns may point to tooth loss, loss of jaw mobility, loss of autonomy, or change in social status[9].
4. **Biomechanical Loadbearing CT analysis:** Differences in cortical bone density can occur due to partial paralysis or unilateral loss of mobility.
5. **Establish Life Course:** Combining the above data, a detailed timeline of an individual's life can be established, elucidating their lived experiences of disability[5].

For the purposes of this poster, the **discussion will focus on the results of the first 2 steps**. Future research will incorporate the listed interdisciplinary methods and culminate in the establishment of individual life courses.

Materials and Site Background

Irchester is a Roman town situated in the Middle Nene Valley, near modern day Northampton, UK (Fig. 1, 2). Due to its key position in the Northamptonshire trade network, it developed into an urban centre in the 1st C AD during the British Iron Age, with continuous occupation throughout the Roman occupation until the 4th, and possibly 5th C[1]. Cemeteries have a total MNI > 130, likely drawing from urban population and surrounding rural areas[1].

This pilot study utilised a sample of 27 individuals (25 adult and 2 non-adults), including 10 females (F and PF), 11 males (M and PM), and 3 intermediate individuals. The population was mainly Middle Adults (N= 16), with only 2 individuals in the Young Adult and Old Adult categories, and 4 Adults of unspecified age due to poor preservation.

Fig. 1 (L): Map of the U.K. marking Irchester in context;

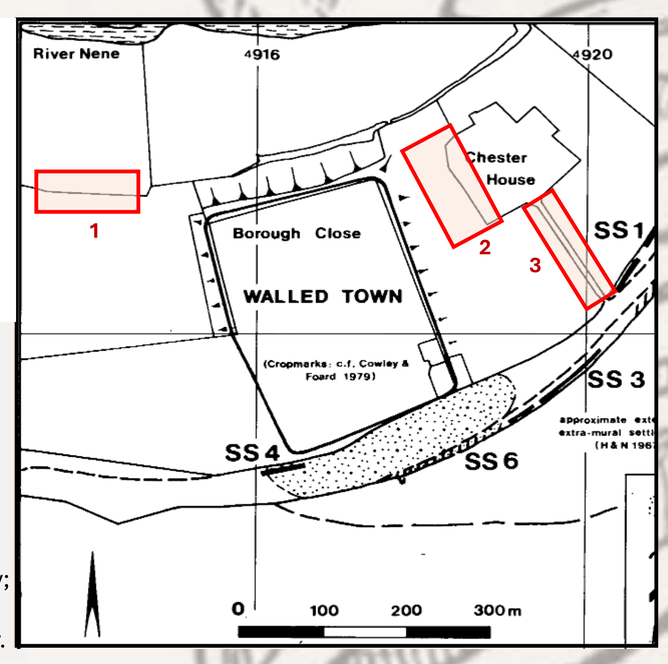


Fig. 2 (R): Map of 1981 excavation of Irchester, outlining the later cemetery excavations in red. 1) Car Park cemetery; 2) Orchard excavation; 3) Lime Avenue cemetery.

Results

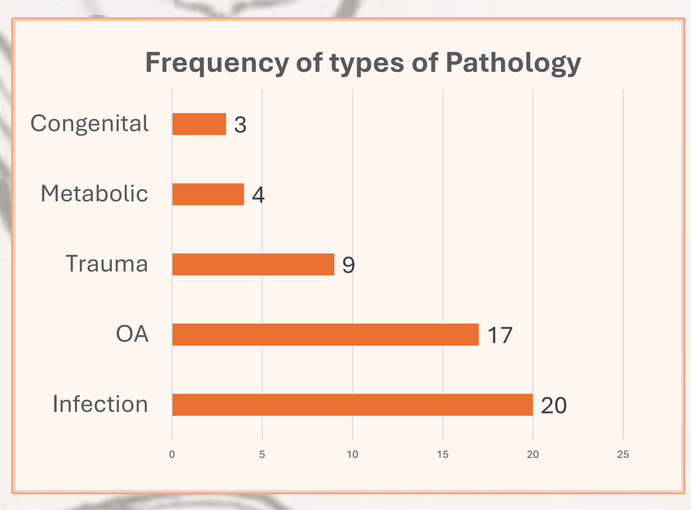


Fig. 4 (L): Bar chart showing frequency of different types of pathologies recorded

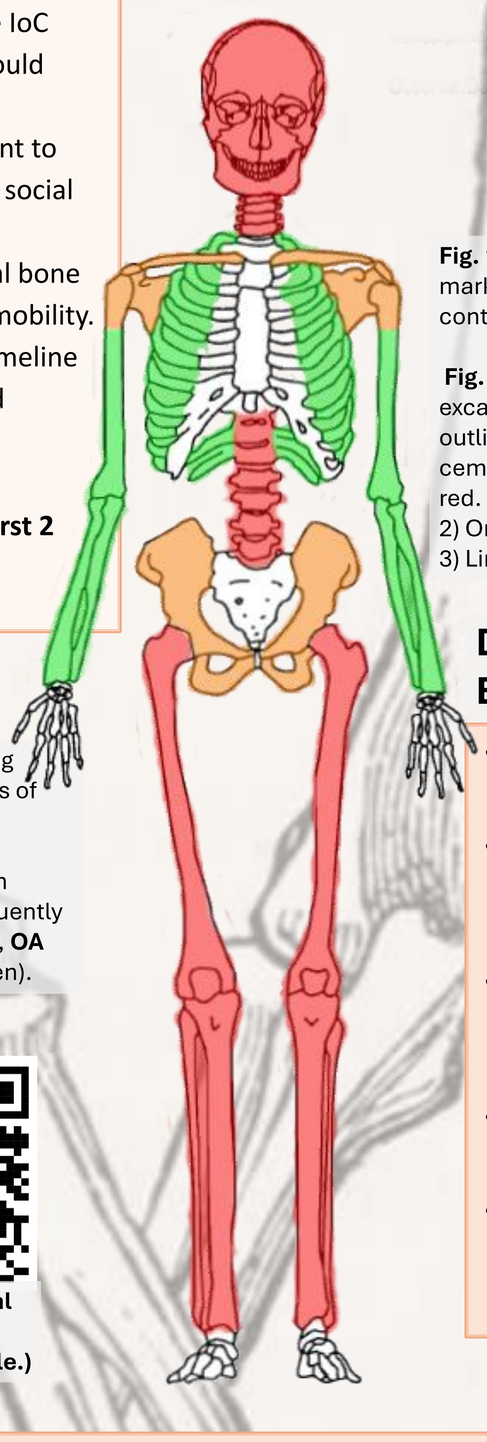


Fig. 5 (R): Skeletal diagram indicating areas most frequently affected by **infection** (red), **OA** (orange), and **trauma** (green).

Scan for Skeletal Photographs (opens in PDF file.)

Discussion
Base Life Course for Sample

- **Childhood physiological or nutritional stress.** 29.6% prevalence of enamel hypoplasia.
- **Activities and occupations involving the upper body.** 40.7% shoulder OA & 55.6% spinal OA. Related to agricultural practices, fishing, and traditional crafts (e.g. weaving).
- **Acute localised infections.** 63% periosteal reactions. Lower limb most common (37.9% prevalence) – temporary loss of limb mobility common.
- **Maxillary and respiratory infections.** 31% prevalence. Some loss of sense of smell expected.
- **Bone fractures of upper body.** 21% fractures of shoulders, arms, and ribs. Echoes OA rates, likely occupational, majority well set and healed with no infection.

Exceptions to the Base Life Course

PSN 2 (Adult F): Left Hip OA

- **Lesion Description:** Flattening of the superior femoral head - likely due to blow to the hip altering the acetabulum shape. The pelvis was too fragmentary, to ascertain injury nature.
- **Impact:** Extensive eburnation suggests some continued use of hip, though this would have been painful. Spinal OA on left vertebral joints suggests compensatory posture changes associated with limping.
- **Care:** May have used walking aid to limit movement, and likely used analgesic remedies.
- **Lived Experience:** Loss of limb mobility common and manageable within community, not very physically disabling. Unable to estimate age precisely, but social perception of disability varied with life stage[10]. If injury and limp acquired before marriage, likely experiences as socially disabling, due to impact on young girl's marriage-ability[11]. If acquired later in life, likely little social impact.

PSN 3 (Middle Adult M): Left shoulder OA

- **Lesion Description:** Complete flattening of the humeral head and extension of glenoid fossa, likely secondary to a blow to the superior humerus.
- **Impact:** Extensive eburnation suggests continued use of shoulder, may have been inevitable due to occupational demands.
  - Osteophytic growth suggests early stages of joint ankylosis, potentially mitigated by continued movement, or alternatively may suggest recent worsening of condition if shoulder use had ceased due to pain.
- **Care:** Potential use of arm sling to take weight off shoulder, and analgesic remedies. Likely needed support in occupation if it involved lifting, or significant arm strength.
- **Lived Experience:** Joint disease expected for individual's life stage and fits into established base life course. However, arm mobility loss may have been seen as occupationally disabling, needing coworkers or slaves to take over his roles, and potentially re-training into a different position that demanded less upper body strength.

PSN 17 Chronic Meningeal Inflammation

- **Lesion Description:** Extensive active new bone formation (NBF) across entire calvarium, including vascular impressions – suggest infection lasting several weeks.
- **Impact:** Depending on aetiology (viral, bacterial, fungal, etc.) may lead to coma or death within a few days without antibiotic treatment.
  - Potentially started recovering, where NBF indicates healing. However, extent of inflammation suggests neurological sequelae, such as hearing and sight loss, reduced motor skills, and development of neurological disorders (e.g. epilepsy)[12].
- **Care:** If in a coma, limited to maintaining hydration, but survival unlikely beyond a week. If recovering but with sequelae, assistance with basic daily activities based on extent of motor function loss, and herbal seizure treatments.
- **Lived experience:** 17-25 year old female. Likely married at the time of death[11]. Caregiving responsibilities could fall on family, husband, or slaves, depending on social status. Meningitis spreads quickly after close contact, so she likely knew others with same disease. Individual experiences of meningitis vary widely depending on environmental and host factors, making local survival or recovery rates unknown, especially as no others in this study had similar lesions[12].

Conclusions

Mobility impairments, dental diseases, and respiratory infections, childhood stress, and age-related conditions an expected part of life in Irchester, mirroring the national pattern of Romano-British health[6]. These conditions were not typically seen as disabling, and effective treatment and care was available.

However, the social perception of physical impairment may deeply affect an individual's life course, creating "social disabilities"[10]. This is especially true for young girls, where any negative perceptions may lower their marriage prospects. In a society where a girl's main route towards social status and virtue was through marriage, this would have a serious impact on her life[11].

Bioarchaeological research often overlooks the lived experiences of individuals with impairments, contributing to a skewed image of past populations where disabled people simply did not exist or play a significant societal role. Future research on this population hopes to build on the growing field of bioarchaeology of disability to further elucidate the rich role disabled individuals played in their communities.

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Images— Background image: *Learning to Draw* (1888), G.P. Putnam Press. **Fig. 1 + 2:** Windell, D. (1984). Irchester Roman Town: Excavations 1981-1982. *Northamptonshire Archaeology*, 19: 31-51. Adapted from Figure 2 in original. **Fig. 5:** Adapted from skeletal red=cording diagram in Buisktra & Ubelaker 1994.