Agricultural Expansion and Specialisation in Roman Britain:

a multi-scaled approach to a complex phenomenon

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Agricultural expansion and specialisation

Intensive farming regimes

- Aim to increase output per area of land through:
  - increased labour
  - and/or adoption of technology
  - increased selectivity

Extensive farming regimes

- Aim to increase output per capita through:
  - increased area of land
  - but without associated increase in labour or the adoption of technology

Van der Veen and O’Connor (1998)

http://commons.wikimedia.org/wiki/File:Florida_chicken_house.jpg
Historical sources and agricultural expansion in Roman Britain

- Evidence for expansion in Britain has traditionally been taken from classical sources

- A burgeoning late Roman woollen industry is commonly cited

- Diocletian’s Price Edict depicts two woollen products:
  - Birrus Britannicus (a hooded woollen cloak)
  - Tepete Britannicum (a woollen household rug)

“The Studer was bred essentially for wool, and was the source of the extensive Romano-British wool industry in the later Roman period.” (Applebaum 1958, Agr. Hist. Rev. VI)
Big data and meaningful interpretation:
Zooarchaeological synthesis and Roman Britain

- Tends exist though considerable variation exists within the dataset
- How can these data help us understand economic structures and cultural landscapes?

Variation in relative frequencies of domestic livestock from Roman-period sites in Britain (from King 1999, 179)
Livestock husbandry

http://www.earthtimes.org/newsimage/pigs130115.jpg
Animal bone preservation and recovery distribution

UK topsoil acidity (pH) data
National trends in livestock frequency through time

- Relative frequency of cattle and sheep/goats remains similar from the late Iron Age until the 2\textsuperscript{nd} C AD
- Cattle remains become significantly more common from the 2\textsuperscript{nd} C AD through to the 4\textsuperscript{th} C AD

No. assemblages >100 NISP = 689
No. assemblages >200 NISP = 516
No. assemblages >400 NISP = 334
National trends in livestock frequency through time

**Enclosed farms (n=118)**

- Cattle: Increasing trend
- Caprine: Decreasing trend
- Pig: Steady trend

**Roadside settlements (n=104)**

- Cattle: Increasing trend
- Caprine: Decreasing trend
- Pig: Steady trend

**Complex farms (n=118)**

- Cattle: Steady trend
- Caprine: Steady trend
- Pig: Steady trend

**Villas (n=66)**

- Cattle: Steady trend
- Caprine: Steady trend
- Pig: Steady trend
Proportions of animal bone recovered by area of excavation from different site types

- **Villa sites**
- **Enclosed farms**
- **Roadside settlements**
- **Vici settlements**
- **Complex farms**
- **Field systems**

骨密度值：\( \log_{10}(\text{每公顷发掘面积的骨头数}) \)
Evidence for increased movement of livestock

Site of Owslebury, Hampshire (Collis 1970), produced a bone density value of 4.4 – the greatest of all farm sites

Variation in cattle strontium values from Owslebury by phase (Minniti et al. 2014)

• Cattle introduced to the settlement from an increasing range of geographic sources over time
• Evidence for increasingly complex network of long distance trade and exchange in Roman Britain
Regional variation in the relative frequencies of primary livestock

Wales and South-West (n=10)
South (n=252)
Central Belt (n=436)
West Midlands (n=9)
East Anglia (n=96)
North-East (n=81)
Northern England (n=8)

Northern England (n=8)
North-East (n=81)
East Anglia (n=96)
West Midlands (n=9)
Central Belt (n=436)
South (n=252)
Wales and South-West (n=10)
Variation in major livestock frequencies on different settlement types in the central belt region

**Enclosed farms**

- Relative frequency of major livestock (cattle, ovicaprid and pig)
- Number of assemblages n=54

**Nucleated settlements**

- Relative frequency of major livestock (cattle, ovicaprid and pig)
- Number of assemblages n=56

**Complex farms**

- Relative frequency of major livestock (cattle, ovicaprid and pig)
- Number of assemblages n=96

**Villa settlements**

- Relative frequency of major livestock (cattle, ovicaprid and pig)
- Number of assemblages n=44
Variation in major livestock frequencies on different settlement types in the southern region

- **Enclosed farms**
- **Nucleated settlements**
- **Complex farms**
- **Villa settlements**
Evidence for livestock production and breeding in the Central Belt and South regions

- **Central belt sites**
- **South sites**

<table>
<thead>
<tr>
<th></th>
<th>Villas (n=44)</th>
<th>Complex Farms (n=96)</th>
<th>Enclosed Farms (n=54)</th>
<th>Roadside Sett. (n=56)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Neonatal cattle</td>
<td>20.0</td>
<td>25.0</td>
<td>25.0</td>
<td>22.0</td>
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<tr>
<td>Neonatal ovicaprid</td>
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<td>35.0</td>
<td>35.0</td>
<td>32.0</td>
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<tr>
<td>Neonatal pig</td>
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<td>20.0</td>
<td>20.0</td>
<td>18.0</td>
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<tr>
<td>Immature equid</td>
<td>5.0</td>
<td>10.0</td>
<td>10.0</td>
<td>8.0</td>
</tr>
<tr>
<td>Immature chicken</td>
<td>5.0</td>
<td>10.0</td>
<td>10.0</td>
<td>8.0</td>
</tr>
</tbody>
</table>
Regional trends in cattle slaughter through time

Iron Age pattern includes numerous sites with a high kill-off of immature cattle

Roman period sites rarely demonstrate a high kill-off of immature cattle

Middle and Late Roman sites more commonly produce higher frequencies of adult and elderly cattle
Variation and specialisation in cattle husbandry

Arkell's Land (Roman)
Prestatyn (Roman)
Droitwich, Old Bowling Green (3rd-4thC AD)
Dalton Parlours (3rd-4thC AD)
Wilcote (3rd-4thC AD)
South of Tunbridge lane, Bottisham (3rd-4thC AD)
Shiptonhurpe (3rd-4thC AD)
Watergate, West Marden (3rd-4thC AD)
Birdlip Quarry (3rd-4thC AD)
Batten Hanger, West Dean (3rd-4thC AD)

Brighton Hill South, Sites B/C and K (1st C BC/AD)
Heybridge, Elms Farm (1st C BC/AD)
Winnall Down/Easton Lane (1st C BC/AD)
Heybridge, Elms Farm (1st-2ndC AD)
The Ditches, North Cerney (1st C BC/AD)
Hacheston (3rd-4thC AD)
Camp Ground, Colne Fen, Earith (2nd-3rdC AD)
Gorhambury (1st-2ndC AD)
Nazeingbury (1st C BC/AD)

Marston Park, Marston Moretaine (LIA)
Icklingham, West Stow (LIA)
Bancroft villa (Roman)
Staniou Roman Villa (1st-2ndC AD)
Wilcote (1st-2ndC AD)
Higham Ferrers OA (3rd-4thC AD)
Marston Park, Marston Moretaine (1st-2ndC AD)
Cotswold Community (2nd-3rdC AD)
Meppershall Roman
Wattle Syke LR (3rd-4thC AD)

minimum sample = 20 specimens
National trends in sheep/goat slaughter through time

• Kill-off pattern for sheep/goat remain remarkably uniform throughout all phases
• No trend towards greater frequencies of adult/elderly sheep
• Little evidence for widespread wool industry in later period - is specialisation in sheep husbandry site specific?

Central Belt sites

Southern sites
Variation and specialisation in sheep/goat husbandry

- Dunkirt Barn, Abbotts Ann (3rd-4thC AD)
- Neigh Bridge, Somerford Keynes (2nd-3rdC AD)
- Monkton (2nd-3rdC AD)
- Wattle Syke (1st-2ndC AD)
- Tolpuddle Ball (1st C BC/AD)
- Springhead, roadside settlement (2nd-3rdC AD)
- Springhead, roadside settlement (1st-2ndC AD)
- Manor Farm, Humberstone (1st C BC-mid 1st C AD)
- Fishbourne Palace (1st-2ndC AD)
- Camp Ground, Colne Fen, Earith (2nd-3rdC AD)

- Grandford, March (Roman)
- Thruxton (3rd-4thC AD)
- Shepton Mallet, Fosse lane (Roman)
- Batten Hanger, West Dean (3rd-4thC AD)
- Shepton Mallet, Cannards Grave (Roman)
- Birdlip Quarry (3rd-4thC AD)
- Birdlip Quarry (2nd-3rdC AD)
- Row of Ashes Farm, Butcombe (1st C BC/AD)
- Sparsholt Roman villa (3rd-4thC AD)
- Braintree, excavations 1984-90 (Roman)

- Higham Ferrers OA (2nd-3rdC AD)
- Poundbury Farm (Roman)
- Great Dunmow (Roman)
- Higham Ferrers OA (3rd-4thC AD)
- Springhead, 1994 pipeline (1st-2ndC AD)
- Heybridge, Elms Farm (1st-2ndC AD)
- Barton Court Farm (1st C BC-mid 1st C AD)
- Dalton Parlours (3rd-4thC AD)
- Suddern Farm, Middle Wallop (1st C BC-mid 1st C AD)
- Grateley South, Grateley (1st-2ndC AD)

minimum sample = 20 specimens
Arable expansion

http://www.picklescott.org.uk/Pitchford1.jpg
Corndrying structures and arable farming

Reconstruction of a corndrying superstructure from Foxholes Farm, Hertfordshire

http://exarc.net/files/styles/large/public/Fig.9%20Fox%20farm0001.jpg?width=600&height=750&iframe=true

percentage of sites with corndriers

<table>
<thead>
<tr>
<th>Century AD</th>
<th>Number of Sites</th>
</tr>
</thead>
<tbody>
<tr>
<td>2nd C</td>
<td>112</td>
</tr>
<tr>
<td>3rd C</td>
<td>186</td>
</tr>
<tr>
<td>4th C</td>
<td>171</td>
</tr>
</tbody>
</table>

2nd C AD (n=112) | 3rd C AD (n=186) | 4th C AD (n=171)

- Villa
- Complex farm
- Enclosed farm
- Nucleated settlement

Old Sleaford, Lincs. (Elsdon 1997)

T-shaped and variants

Leadenham Quarry, Lincs. (WYAS 2001)

circular ‘drying floors’

Great Casterton Villa, Rutland (Corder 1951)
Later Roman corndryers inserted into existing structures

Distribution and relative density of sites with ‘monumental’ corn dryers

**Late 1st century AD**

17 sites

Very few examples potentially date back to the end of the 1st Century AD

Reconstructed Romano-British ‘corn drier’ at Butser

http://www.butser.org.uk/iafrbgd_hcc.html
Distribution and relative density of sites with ‘monumental’ corndryers

**Early 2nd century AD**
86 sites

2nd C AD increase in sites with corndrier with focus on Fens and Cotswolds

Reconstructed Romano-British ‘corndrier’ at Butser
http://www.butser.org.uk/iafrbgd_hcc.html
Distribution and relative density of sites with ‘monumental’ corndryers

**Late 2nd century AD**

115 sites

2nd C AD increase in sites with corndrier with focus on Fens and Cotswolds

Reconstructed Romano-British ‘corndrier’ at Butser

http://www.butser.org.uk/iafrbgd_hcc.html
Distribution and relative density of sites with ‘monumental’ corndryers

Early 3rd century AD
138 sites

3rd C AD sees the most widespread distribution of sites with corndriers

Reconstructed Romano-British ‘corndrier’ at Butser
http://www.butser.org.uk/iafrbgd_hcc.html
Distribution and relative density of sites with ‘monumental’ corndryers

Late 3rd century AD
153 sites

3rd C AD sees the most widespread distribution of sites with corndriers

Reconstructed Romano-British ‘corndrier’ at Butser
http://www.butser.org.uk/iafrbgd_hcc.html
Distribution and relative density of sites with ‘monumental’ corndryers

Early 4th century AD
175 sites

Early 4th C AD sees a peak in the number of sites with corndriers, but the beginning of a contraction in their distribution

Reconstructed Romano-British ‘corndrier’ at Butser
http://www.butser.org.uk/iafrbgd_hcc.html
Distribution and relative density of sites with ‘monumental’ corndryers

**Late 4th century AD**
145 sites

By the late 4th C AD, the distribution of sites is weighted towards the Hampshire downland and the upper Thames valley

Reconstructed Romano-British ‘corndrier’ at Butser
http://www.butser.org.uk/iafrbgd_hcc.html
Diversification in arable processing output

- Arable processing buildings at southern end of farm at Grateley South

- Archaeobotanical samples from three corndryers were predominantly hulled spelt wheat with very little barley

- Another included quantities of sprouted grain from left hand flue and very few from the right

- Spatial variation indicates that the corndriers were multifunction, i.e. one flue producing grain for ale (malting) and others for flour (grinding)

4thC AD phase

Grateley South, Hampshire
(Cunliffe and Poole 2008)
Production of beer for market: Northfleet, Kent

Schematic view of 4thC AD villa complex at Northfleet, Kent, depicting malting oven, granary, and quayside evidence (Andrews et al. 2011, 223)

4thC AD malting oven at Northfleet villa, Kent (Andrews et al. 2011, 185)
Evidence for malting and brewing

- Cereal grains allowed to germinate and then dried to halt germination, readying the grain for fermentation
- 174 sites with a combination of archaeobotanical alongside associated structural remains found
- 101 sites with evidence for parched and germinated grain but without structural features: possibly malting waste, spoilt grain, or livestock fodder
Horticulture and cash crops

http://www.peoi.net/Courses/Coursesen/socfwk/Resources/barkan-fig05_x004.jpg
Sites with evidence for bedding/horticultural trenches

- Apparent 2ndC AD peak in number of sites with horticultural beds
- Parallel gullies dug for horticultural production
- Environmental assemblages are of variable use - lack of waterlogged samples
Early Roman changes in land-use: the Nene Valley and Cambridgeshire fens

Land adjacent to Oundle Road, Peterborough Business Park (Mackay 2002)
Vineyards in the Nene Valley

- Wollaston I, Northamptonshire (Brown et al. 2001)
- Evidence for extensive area of regularly-spaced trenches and post-holes in raised beds for support (2nd-3rd C AD)
- Pollen samples indicate the presence of grape
- Lack of agricultural tools or wine-press equipment

Environmental evidence from sites with horticultural trenches

*Grape Vitis vinifera pollen

Flax cultivation?

- 89 sites with evidence for flax
- Greatest density of sites with flax remains in the central belt, less numbers on the south coast, in the midlands and north-east
- Flax cultivation suited to rotation with cereals or legumes
- Difficult to identify cultivation
  - context
  - frequency of remains
Flax processing evidence

Old Shifford Farm, Standlake Site M., Oxon

- Pits produced a few waterlogged flax seeds and numerous flax capsules in the lowest, silted deposits – waste from retting?

Possible flax-retting pits

http://homepage.ntiworld.com/sean_quinn/cdun/knock.jpg

Early 20th century flax retting
Regional land-use patterns: continuity and change

http://www.lucideastafrica.org/images/kenya_tanzania.jpg
Chalk downland and enclosed settlement
South chalk downland –
continuity of enclosures and investment in farms

Dunkirt Barn, Abbotts Ann
Late Iron Age

Early Roman: Phase A

Early Roman: Phase B

Late Roman: Phase C

Perry 1986

Cunliffe and Poole 2008
Later Roman arable strip fields in the chalk downland river valleys
East Anton (Leucomagus?), Hampshire
Excavation at periphery of roadside settlement revealed enclosure system and up to 12 corn-drying ovens
Middle Thames valley:
from open settlement to complex farms and co-axial fields

Ashford Prison, Spelthorne (Carew et al. 2006)
Middle Thames valley:
from open settlement to complex farms and co-axial fields

Roman complex settlement (laid out 1stC AD?)
Hengrove Farm, Staines (Poulton 2007)
Middle Thames valley: from open settlement to complex farms and co-axial fields

late Iron Age/early Roman settlement and co-axial field-system

Perry Oaks/Heathrow Terminal 5
(Lewis and Smith 2010)
Middle Thames valley: from open settlement to complex farms and co-axial fields

Kingsmead Quarry, Horton (Chaffrey 2009)
Specialist farming and agricultural expansion: a multi-scaled approach?

- The historical sources are a poor and one-sided indicator of agricultural practices in Roman Britain, and are not equipped to deal with the regional and socio-economic variation.

- Farming communities must have dealt with and negotiated numerous factors which impacted on their farming decisions (social, political, etc.).

- Decisions on agricultural practice are restricted by availability of local land and labour, and by the social position of farmers.

- Land-use patterns suggest major intra-regional variations occurred.

- Zooarchaeological and archaeobotanical data demonstrate that patterns of specialist activity and expansive regimes were socially, chronologically and regionally varied.

- Increasing cattle frequencies and shifting slaughter patterns may be more reflective of a widespread social change, than they are of local economic choices.