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FEEDING ANGLO-SAXON ENGLAND: THE BIOARCHAEOLOGY OF AN AGRICULTURAL REVOLUTION ('FEEDSAX')

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A four-year project to trace the expansion of cereal production in England associated with the spread of open-field farming will deploy a range of scientific methodologies together with settlement archaeology to generate new data and advance understanding of a long-standing debate. The project, which is funded by the European Research Council (AdG741751), is based at the Universities of Oxford and Leicester.

The period between *c*. 800–1200 AD saw dramatic changes in farming practices across large parts of Europe, making possible an increase in cereal production so great that it has been described as an agricultural revolution. This 'cerealisation' allowed post-Roman populations not only to recover but to thrive, fuelling the growth of towns and markets. Three key innovations made this increase in yields possible: crop rotation, *e.g*. planting with winter wheat followed by spring barley; widespread adoption of the mouldboard plough, enabling farmers to cultivate heavier, more fertile soils; and extensification of cultivation, whereby fertility was maintained not by intensive manuring or long periods of fallow, but by short fallow periods during which sheep – whose droppings fertilized the fields – grazed on the stubble.

To operate this more productive but costly system of farming, peasants shared expensive resources such as teams of oxen and mouldboard ploughs, and cultivated extensive, unenclosed, 'open fields' communally. This need to coordinate cultivation activities is thought to lie behind the formation of the nucleated villages set amid extensive arrays of strip fields that still characterise many parts of the countryside today. In this way, innovations in farming transformed not only large parts of England's landscape, but also its social geography. Yet researchers have until now been forced to rely on a limited range of indirect evidence, written and archaeological, to infer when, where and how this unprecedented form of agriculture emerged. The extent and significance of its impact on Anglo-Saxon England has been vigorously debated for over a century, without any clear consensus emerging.

The FeedSax team (Helena Hamerow, Amy Bogaard, Mike Charles, Christopher Ramsey, Richard Thomas, Emily Forster, Matilda Holmes, and Mark McKerracher) will trace the origins and spread of the 'mould board plough package' – i.e. crop rotation, use of the mouldboard plough, and extensification – by generating new, *direct* evidence of medieval land use and cultivation regimes excavated plant remains and animal bones, using a range of scientific methodologies. Analysis of crop stable isotopes in preserved cereal grains and sheep bones will enable us to assess the degree to which productivity was boosted by manuring; weed flora will also reveal the extent to which fields were manured and tilled, as well as provide evidence of sowing times and crop rotation. The lower limb bones of cattle will be examined for pathologies caused by pulling a heavy plough. Pollen data will reveal the changing impact of cereal farming on the medieval landscape and will be used to produce the first national model of early medieval land use. Patterns emerging from these bioarchaeological data will then be compared with the evidence from excavated farms – buildings, enclosures, droveways, *etc*. – to explore the inter-relationship between arable production, stock management and settlement forms. Finally, a suite of over 400 radiocarbon dates on charred cereals, bones and pollen cores will make it possible accurately to locate the origins and spread of open fields in time and space.

The results of a pilot project to assess charred plant remains in archaeological deposits of the eighth to thirteenth centuries have already been published in *MSR* (McKerracher 2016). By integrating new, bioarchaeological data with the evidence of settlement archaeology, the full project will seek to establish the nature and productivity of the cereal husbandry regimes that fed – quite literally – the demographic and economic expansion witnessed in early medieval England (Fig. 2).

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Figure 2 Farmland on Magdalen Hill Down, Hampshire, 2016. Photo: Mark McKerracher.

Bibliography

McKerracher, M. 2016. Playing with fire? Charred grain as a proxy for cereal surpluses in early medieval England, *Medieval Settlement Research* **31**: 63–66.