Institution: Oxford University

Unit of Assessment: Archaeology

a. Overview

Archaeology at Oxford investigates long-term human histories from our early human ancestors to the creation of modernity. We develop and deploy the latest scientific techniques, combining the critical rigour of the social sciences with empirical richness deriving from fieldwork and laboratory analysis. Landscape, material culture and the human body are our foci, complemented by a judicious use of textual evidence, where possible. Our research spans Europe and the Mediterranean world; Asia from Saudi Arabia to China and southeast Asia; Africa, north, east and south. We are one of the largest and most diverse groups of archaeologists in Europe.

Since 2008, we have invested in facilities and world class researchers, including:

- New posts in Asian archaeology (*Boivin, Rawson, Petraglia*), palaeobotany (*Charles*), Later Medieval Archaeology (*Standley*) (a shared post with the Ashmolean Museum) and Etruscan archaeology (*Potts*);
- Staff replacements enhancing our capabilities in stable isotopes and African archaeology (*Lee-Thorp*) and Byzantine archaeology (*Niewohner* - shared post with History and Classics);
- New facilities including an Archaeobotany Lab, additions to the Stable Isotope Lab and electron microscopes (totalling £670,000);
- A greatly enhanced level of financial support for Graduate Students (25% now have scholarships). In partnership with several colleges, we have invested £92,000 of internal funds in studentships, since 2008.

The posts listed above arise from a decision to maintain areas of continuing strength (Europe and the Near East), as well as rebalancing towards Africa and Asia. Thirty five active researchers are returned and thirteen are Early Career Researchers (ECRs) (rising from eight in 2008), reflecting an increasingly good balance between early career stage and more experienced researchers. Our postgraduate community includes 120 doctoral students, one of the largest cohorts in the country, and we have awarded 109 doctoral degrees during the REF period. We have made student support a priority, with scholarships (above) and funds for student research (£75,000 since 2008).

Our research is organized around six research themes: Palaeolithic Archaeology and Human Evolution, African and Eurasian Prehistory, Historical and Classical Archaeology, Subsistence and Environment, Chronology and Climate, Technology and Trade. This structure allows for focus and connectivity in the research, with the majority in the School working within more than one theme, creating linkages and synergies through collaborative projects. We have active collaborations within Oxford (Anthropology, Classics, Earth Sciences, Geography, History, Zoology, the Ashmolean and Pitt Rivers Museums) reflected in shared posts and activities. National and international collaborations exist in all key geographical areas, both in academia and key areas of archaeology and cultural heritage.

The School of Archaeology has three main physical units —the **Research Laboratory for Archaeology and the History of Art (RLAHA)**, the **Institute of Archaeology** and the **Classics Centre**; also with two members who hold joint curatorial posts in the Ashmolean and Pitt Rivers Museums. Within these Units we also have three Research Centres, two of which are externally-funded: the **Oxford Centre for Maritime Archaeology (OCMA)**, the **Radiocarbon Accelerator Unit**, and the **Oxford Centre for Asian Archaeology, Art and Culture (OCA)**.

For RAE 2008, our external research grant income totalled £5,855,500. In the REF period we have diversified our external research income and increased it to £9,540,745, representing an increase of over 50% in research activity per FTE cat A staff, which exceeds the aspirations expressed in 2008, to 'maintain our annual research income at or above £1.5M per year'. This increase is partly due to diversification in our sources of income, especially our success in applications to the ERC, who have awarded us no fewer than six grants, distributed across four of our six research themes, at all career stages from Starter to Advanced.

b. Research strategy

At the core of our research is the attempt to understand what it means to be human in the distant and recent past from the first appearance of tool-using hominins to the development of global capitalism. This ambitious aim is made manageable through our six research themes, three of

which (Palaeolithic Archaeology and Human Evolution, African and Eurasian Prehistory, Historical and Classical Archaeology) are period- and area-specific and three (Subsistence and Environment, Chronology and Climate, Technology and Trade) are based on crucial topics in archaeology. The regional/chronological and the thematic can be distinguished in terms of the kinds of support needed and the outcomes they produce, but also the way in which these complement each other, providing a commonality of purpose across the School. Broadly speaking, the first three themes require fieldwork or analysis of existing material, the latter three are approached through laboratory analysis and subsequent synthesis. Our research strategy is based around support for fieldwork and analysis on the one hand and the provision of the necessary analytical apparatus and expertise on the other.

Key to our provisioning of research has been success with large grants: we have had seven grants between £500,000 and £1,800,000: three in Asia, three in Europe and one world-wide. Each supports teams of senior researchers, post-doctoral workers and students. Each project has its own demands and dynamics, but by fostering connections between the teams, we can ensure linkage between projects and between the broader themes. The senior researchers take on an important mentoring role for less experienced members of the project teams.

Mechanisms for Implementing and Reviewing Strategy

Our research strategy is developed and implemented at two main levels. The Finance and Strategic Planning Sub-committee, made up of seven senior figures within the School representing all of its key constituencies, coordinates overall strategy, deciding on the nature and direction of research, the facilities needed to underpin research and the refilling of old posts or the creation of new ones. This makes recommendations to the Committee of the School of Archaeology (made up of all postholders including ECR representatives) where new directions and their implementation are discussed. The views of ECRs have been important in decisions on research directions. Through these mechanisms the six research themes (discussed below) were established in 2010, following feedback from the RAE panel suggesting that our research strategy needed to foster greater cohesiveness across the School. The themes are based on intellectual coherence and a critical mass of expertise rather than on narrowly defined research agendas. All themes have members from the three main centres within the School. All have built up impressive project, publication and grant portfolios. Further evidence of inter-connection between researchers across the School is the fact that 20 of our current doctoral students have a supervisor in both the RLAHA and the Institute, with projects ranging from residue analysis of amphorae to isotopic analyses of late Roman and early Anglo-Saxon burials.

We decided to build on long-term strengths in prehistoric and historic Europe, the Mediterranean basin and the Near East. In addition, we are also in the process of strategically rebalancing our geographical focus, with increased activity in Asia and Africa. We also have rapidly developing strengths in bioarchaeology (palaeobotany, isotope ecology). Recruitment of new staff has been central to this rebalancing, with the appointments of Boivin, Charles, Lee-Thorp and Petraglia all serving to broaden and deepen our expertise in African and Asian archaeology as well as isotopic analysis and in palaeobotany. These appointments reflect the aims in our strategic 5-year plan submitted by the School to the University for Review in 2008.The establishment of the externally-funded OCA reflects our growing research presence in Asia. We are now very close to achieving our goal of establishing an endowed Lectureship in Chinese Archaeology. Our success in establishing a research base in Asia is demonstrated by several major externally-funded projects: Boivin's work to chart ancient links across the Indian Ocean, Gosden's research in southeast Asia, Petraglia's examination of human expansion out of Africa and into the Arabian peninsula and India, Pollard's 'Below the Salt' project in Iran, Rawson's investigation of the impact of central Asian technologies on Bronze Age China and Schulting's work on hunter-gather subsistence at Lake Baikal and in Japan. Wilson researches and supervises graduate students in, Indo-Roman trade. OCA coordinates these activities and runs a seminar series that serves as a meeting point for those working in the region. In all such work, collaborations in the regions involved are of great importance.

We have also extended our traditional strengths through the creation of a Curator-Lectureship in Later Medieval Archaeology (Standley) giving a fuller temporal coverage and fostering joint research and outreach initiatives with the Ashmolean Museum, with whom this is a shared appointment. Niewohner was appointed in 2011 to develop work in Byzantine archaeology through

a post shared with History and Classics. The appointment of Potts in 2013 has strengthened our Mediterranean interests in an important manner through work on Etruscan Italy.
Long-term, large-scale excavations continue as a central activity for which support is given – a prerequisite to producing the large archaeological data-sets needed to address major questions about the past. Examples include those conducted abroad, as in the Taforalt caves, Morocco (Barton), Aphrodisias (Smith) and most recently at the Minoan palace site of Knossos (Bogaard & Charles) but also near Oxford, notably at Marcham, where we excavated for 11 seasons, and in the Roman town of Dorchester-on-Thames where we have worked in collaboration with Oxford Archaeology for eight seasons (Gosden and Hamerow).

Research Themes and Centres
Each of our Research Themes is now seeing several major projects come to fruition with the establishment of substantial new initiatives. Below we review each theme in turn, outlining the main objectives and drivers over the last five years as well as some key achievements. Within each theme we discuss individual projects to demonstrate that the strategy has been implemented not just at the level of the School, but also through the activities of individuals and research groups.

Theme 1. Palaeolithic Archaeology and Human Evolution
In tune with our overall strategic aims we continue to develop our focus on 'big' questions in human evolution. Supporting large-scale fieldwork in a number of locations has been key, e.g. Morocco, India and the Arabian peninsula, but also we have ensured support for novel analytical techniques for establishing chronology beyond radiocarbon and determining environmental conditions and transitions.

Three large excavation programmes form an essential element of this research: i) in North Africa, Barton's excavations of Taforalt Cave - 'Cemeteries & sedentism in the epipalaeolithic of North Africa', (Leverhulme) - have shown that evidence for early modern cognitive behaviour in North Africa. The timing and nature of decorative shell beads is remarkably similar in Southern and North Africa; ii) Excavations by Petraglia's team in India (Leverhulme, British Academy) have located multiple Middle Palaeolithic sites, analysed mico-tephras from the Toba super-eruption 74,000 years ago, throwing light on human movements out of Africa and responses to environmental shifts; iii) A new large-scale survey and excavation programme is now underway in the Arabian Peninsula ('Palaeodeserts', ERC), aimed at elucidating the routes and timing of "out of Africa" scenarios.

Analytical developments underpin other work in this area and we have ensured that appropriate teams and infrastructure were in place, especially through the maintenance of dating facilities through grants and internal income. Higham's redating of the Middle to Upper Palaeolithic transition in western Europe (NERC), pushes the incursions of modern humans and the apparent demise of Neanderthals further back in time. Higham's new £1.8 million ERC-funded programme is extending this work into Central Europe and Western Asia, while Higham and Lee-Thorp are re-evaluating several important sequences in Southwest Europe (SSHRC).

The recruitment of Lee-Thorp has led to research on stable light isotopes, demonstrating an early dietary shift towards the incorporation of C4 resources in hominin diets, around 3.5 million years ago, revolutionizing our understanding of early hominin diets, as confirmed by a substantial dataset from eastern Africa. Work continues in Laetoli and several new survey, excavation and analytical programmes are underway. Investment in the Stable Isotope Laboratory has supported this work.

New insights into the evolution of stone tool use by hominins can be based on primate analogies. Haslam and colleagues (NERC, ERC) are showing that habitat, ecology, and diet have an impact on primate technological innovation, the first time that the activities of primates have been described using archaeological methods. We are also developing an important new specialism, with examinations of the development of bodily intelligence (language, performance) in human evolution (Malafouris, Morley); work we are keen to support further. Malafouris's post is joint with Keble College and partly supported privately.

Cat A staff: Barton, Haslam, Higham, Lane, Lee-Thorp, Malafouris, Mitchell, Morley, Petraglia, Ramsey, Schulting, V. Smith.

Theme 2. African and Eurasian prehistory

Targeted appointments have given impetus to our research in this area, underpinned by several large, funded projects. These projects have supported fieldwork and the infrastructure for analysis. The theme of inter-continental connections, particularly between Africa and Southwest Asia, links to questions of early human expansion (Theme 1).

We encourage work on large scales, both geographically and temporally, exemplified by 'SEALINKS' (Boivin ERC), which explores early seafaring linkages around the Indian Ocean largely by tracking exchanges of domesticated plants, objects and languages across the Indian Ocean. It relies on a multi-disciplinary, international team of scholars and is complemented by Crowther's exploration of the transition to agriculture in East Africa and work on the detection of starches.

Rawson's research on the interactions between central China and Inner Asia from the Zhou to the Han periods, examines how new technologies from outside China, such as bronze working and novel styles of personal ornament, were taken up within China. Such work has allowed us to set up better connections in China, but also in Russia. Through an important international collaboration, funded by the Canadian SSHRC, Schulting is also investigating Holocene hunter-gatherers across Northeast Asia, comparing regions between Lake Baikal and the Japanese Archipelago.

Success in World Bank and other funding for southern Africa, has enabled Mitchell (with Lee-Thorp) to focus on the links between hunter-gatherer responses and late Glacial climate swings. Longstanding investigations into Later Stone Age hunter-gatherer-foragers of southern Africa focus on interactions between subsistence, the cultural record and environmental change in the highlands of Lesotho, where late Glacial and early Holocene climate shifts were felt most keenly.

Investment in the Archaeobotany Laboratory supported Bogaard's work on LBK sites in central Europe in elucidating the early history of agriculture there and, closer to home, Gosden's English Landscapes and Identities project (ERC) examines the long-term history of the English landscape from 1500 BC to AD 1086, combining landscape features such as track-ways, fields and settlements, with the distribution of metalwork. In this last aspect, it connects to his work on Celtic art in Britain (AHRC).

Cat A staff: Barton, Bogaard, Boivin, Charles, Crowther, Gosden, Higham, Hulin, Lane, Lee-Thorp, Malafouris, Mitchell, Petraglia, Pollard, Ramsey, Rawson, Robinson, Schulting, Staff.

Theme 3. Historical and Classical Archaeology

We have chosen to reinforce and extend our coverage of historical periods and thanks to recent appointments (notably Hicks in 2007, Standley in 2009, Niewohner in 2011 and Potts in 2013), the School now has research projects examining the relationship of archaeological and written sources across a span of nearly four millennia, ranging from the Ancient Near East to the modern world. A particular strength lies in examining how the interrelationship of texts and material culture reveals the nature of states and state formation, with a number of on-going field projects giving particular emphasis to the role of architecture and art in mediating power in the ancient and post-Classical worlds. Science-based approaches are being deployed to understand the role of population movements in the transition from Roman Britain to Anglo-Saxon England in a Leverhulme-funded project, 'Mass migration and apartheid in Anglo-Saxon Britain? An ancient DNA re-evaluation (Pollard, Hamerow).

A recently-supported focus on the economic underpinning of states through rural and urban production is exemplified by the externally-funded Oxford Roman Economy Project (OxREP - Wilson), a collaboration with the Faculty of Classics. OxREP addresses the fundamentals of the imperial economy utilizing quantifiable bodies of archaeological and documentary evidence on agriculture, rural and urban craft production. In a similar vein, developments in farming in the seventh to ninth centuries have been related to changes in settlement forms and the emergence of kingdoms in mid-Saxon England (Hamerow).

A range of grants have allowed growing interest in archaeological archives and a desire to work on the history of collections is manifest in projects such as 'An Anthropology of Englishness' (Gosden, ESRC), 'Excavating Pitt-Rivers' (Hicks, Arts Council England), and 'The Jacobsthal Archive Project: Persecution and Survival' (Gosden, HLF & Logan Foundation), as well as increasing numbers of doctoral candidates working in this area.

Cat. A staff: Dee, Gosden, Griffiths, Hamerow, Hicks, Hulin, Martin, Niewohner, Pollard, Potts, Rawson, R. Smith, Standley, Wilson.

Theme 4. Chronology and Climate

We have continued our long-standing development of dating and calibration methods. There has, however, been a strategic re-focusing towards understanding the climatic context in which humans have operated over the late Quaternary period and how they reacted to changes in their environment. Internal and external collaboration is crucial. The research has three main strands: development of cutting-edge techniques; archaeological research applying these techniques; and the development of methodological tools for calibration in collaboration with the wider academic community.

Collaboration and combining multiple techniques, including tephrochronology, radiocarbon dating, environmental research, and statistical methods is also important. The RESET project, which teases out how early humans responded to rapid climate change, is conducted as part of a $3.4M NERC consortium project with scientists from Geography and Earth Science, Royal Holloway, the National Oceanography Centre and Archaeology, Southampton University, and the Natural History Museum. Precise chronology is crucial in historical and proto-historical periods; for example, in the application of radiocarbon dating to the chronology of Ancient Egypt (Ramsey & Dee), which uses the collections of the Ashmolean Museum. Building on our success in using ultrafiltration methods (Higham), we now use single amino acids for dating palaeolithic bone.

We have supported collaboration and outreach, providing results, datasets, dating services and research tools to the wider academic community. A key example of this is the first fully terrestrial radiocarbon record covering the last 50,000 years (Ramsey and Staff), which was the culmination of a multi-national collaborative research project on Lake Suigetsu, Japan, looking at radiocarbon and climate proxies in this annually laminated core (led by Newcastle University). This will have a significant impact on all archaeological applications of radiocarbon for the Palaeolithic and associated environmental studies. Alongside this our researchers have focused on the development of statistical analysis methods (Ramsey), which now underpin many of the chronological applications of radiocarbon in all areas of archaeology.

Cat A staff: Barton, Brock, Dee, Higham, Lane, Lee-Thorp, Petraglia, Pollard, Ramsey, Schulting, V. Smith, Staff

Theme 5. Subsistence and Environment

We have expanded our scope beyond carbon and nitrogen to explore further isotope systems (such as hydrogen and oxygen isotopes), and other tissues or materials; relying on studies of isotope ecology in modern systems, and on experimental work. This broadening of our research is supported by investment in the Stable Light Isotopes Laboratory (over £200,000), by closer collaboration with Oxford's Earth Sciences Department, and by significant levels of grant income. Analyses of these new isotopic systems provide proxies for past forms of subsistence and of changing environments. These proxies are easily 'transportable' relevant to projects in China, Iran, the Near East, Africa, South America, continental Europe and, nearer to home, the Thames Valley.

We continue to explore marine or aquatic inputs to human diets through new case studies (Schulting) and isotopic compositions and radiocarbon reservoir effects of individual amino acids (Hedges, Higham). We have also addressed isotope patterns in different tissues and micro-sampling as a way to address early life histories and later health (or death) impacts (Schulting & Lee-Thorp). The isotopic analysis of multiple skeletal tissues and the associated textiles from the human remains of Chehr Abad, an Iranian salt mine, represent the only avenue for obtaining information about their origins and nutrition status, and use of the mine (Pollard).

The development of farming from the early Neolithic onwards remains a strongly supported area, understood through analyses of humans, domestic animals and plants in combination. Hedges compared the isotopic composition of early European Neolithic humans and their fauna, in order to assess subsistence and environment differences during the rapid advance of LBK groups into Europe (a Leverhulme-funded project with Cardiff). Further research integrates information from archaeobotanical remains and explores the earliest agricultural practices (Charles, NERC and ERC). The 'Crop Stable Isotope Ratios' project (NERC; Bogaard) examines in detail the effects of manuring and burning on the isotope ratios of crops. Related projects include assessment of agricultural practices in Southeast and Central Europe as part of a broad consortium, shifts in the nature of crop and animal husbandry at the iconic, multi-period site of Çatalhöyük (Bogaard and Charles), and the spread of farming practices in Ireland (Bogaard and Schulting, AHRC). The results form the basis for the next phase of research - assessing how agricultural intensification

underpinned urban settlement in the broader eastern Mediterranean area (Bogaard, ERC).

Palaeoenvironmental questions are addressed both from the perspective of the individual site, and on a broad geographical and chronological scale to elucidate shifts over time. The first approach has been followed to address environmental contexts over time in the Thames Valley and from the incinerated contents of Herculaneum and Pompei (Robinson).

Cat A staff: Bogaard, Boivin, Charles, Crowther, Hedges, Higham, Lee-Thorp, Pellegrini, Pollard, Robinson, Schulting.

Theme 6. Technology and Trade

The study of trade and technology are only fully possible by making full use of the scientific and humanistic interests of members of the School. Geographically the two major foci are the Bronze and Iron Ages of Eurasia, and trade and economy in the ancient Mediterranean. Work on the former is being pursued through large-scale analysis of bronze metalwork, involving the creation of a GIS database of over 100,000 analyzed objects and using a new interpretative methodology which specifically addresses issues of recycling and breaks away from the traditional 'provenance' paradigm (Pollard, Bray and Gosden; 'Chemical structure and human behaviour: a new model for prehistoric metallurgy', Leverhulme). Large-scale analysis of bronze is an important area of future development. Links with Asia are also important, for example, the use of cobalt blue underglaze pigment in early Islamic ceramics and Chinese porcelain, both the idea and the pigment itself seem to have travelled from Iran to China (Pollard). OCMA, established 2003 promotes and coordinates work on trade around the Mediterranean and beyond and is carrying out an excavation of a shipwreck at the ancient port-city of Thonis-Heracleion, Egypt, in order to understand its unusual construction, apparently a response to the lack of local timber resources, and the date and circumstances of its sinking (Wilson). This work is partly funded from private sources (mainly the Hilti Foundation).

Cat A Staff: Boivin, Gosden, Haslam, Hulin, Pollard, Rawson, Wilson

2.3 Strategic Aims from 2014 onwards

From 2014, our strategic aims revolve around the recruitment and replacement of world-class researchers in the key geographical and topical areas we identified above, together with the provision of appropriate infrastructure and support. These include:

- Staffing: Creation of a post in the archaeology of China. This might be complemented with further lectureships specializing in Asian topics through endowment or other means;Also, the creation of a post in the emerging field of archaeogenetics, together with the necessary laboratory support. Work in this area would complement that on isotope ecologies on the use and movement of domesticates and of humans;
- Development of a knowledge exchange (KE) and impact strategy, potentially including administrative posts to support KE and outreach, which would further our links outside academia in the UK and internationally;
- Development of greater financial support for graduate students
- develop further multi- and inter-disciplinary links with museums and departments in Oxford and beyond

c. People, including:

i. Staffing strategy and staff development

	REF 2008	REF 2014
Early Career Researchers	8	13
Research Students	104	120
% of funded DPhils	15%	25%
Externally-funded Research staff	10	23

Our staffing strategy is in essence to appoint outstanding researchers, give them the best facilities and environment we can and create as much 'space' as possible for them to develop their research. Of the 35 (33.3 FTE) researchers being returned, 13 are ECRs and 13 are professorial, most of the latter representing promotions made by the University in its externally-benchmarked 'recognition of distinction' exercises that reward outstanding, internationally-recognized research.

The School thus possesses a good balance between ECRs and more experienced researchers. Of 13 professorial staff, four are women, which broadly reflects the proportion of women in the School overall.

New members of staff have been recruited to strengthen and develop strategically important areas, notably Asian archaeology and early farming. Boivin and Petraglia have given our work in Asia great impetus, as has Rawson, one of Europe's leading scholars of the art and archaeology of China and we are now to make a permanent appointment in Chinese Archaeology through the Peter Moores Foundation and money from the School, in 2015. All have important links with local researchers. The appointments of Bogaard and Charles now give us new expertise in the area of early farming, complementing existing work by Robinson, particularly in the isotopic analyses of grain as a way of understanding cropping regimes. Lee-Thorp's appointment adds substantially to our existing expertise in isotopic analysis, as well as in African archaeology, and her work links with Mitchell and Boivin in southern and eastern Africa respectively. Standley's appointment had a two-fold aim: to strengthen Archaeology's ties with the newly rebuilt Ashmolean by creating their first curator-lecturer (along the model of Hicks' post at the Pitt Rivers Museum), and to extend our chronological range into the later medieval period. We hope that this will foster further collaborative research on the archaeological collections of the Pitt Rivers and Ashmolean (Standley and Hicks). The work of Potts combines historical and archaeological evidence for Etruria. We actively maintain strong internal collaborations within the University, sharing one post with History (Hamerow) and one with History and Classics (Niewohner). We also have important links with Anthropology, Art History, Earth Sciences and Zoology.

For all staff we provide financial support and mentoring. The School deploys internal funds to support research, principally the Meyerstein Fund (c. £15,000 per year). In addition, the University-wide and extremely competitive Fell Fund is available to all staff, with special provision for ECRs. Since 2008, the School has obtained £1,026,425 from this source, which has funded purchases of equipment and has allowed us to carry out a series of pilot projects, which have provided the basis for successful applications for external funds. University Research Facilitators circulate information about potential funding, run workshops on grant applications and hold public meetings with the AHRC, Leverhulme etc. Within the School of Archaeology, senior post-holders and a Research Coordinator (Gosden) share successful grant applications, peer-review large applications and hold mock interviews for ERC and other applicants who have been short-listed. We also review unsuccessful applications, advising on improvements. Since 2008, the School's Finance Officer has been re-graded and now also acts as a Research Officer, identifying funding sources and preparing project budgets for academic staff.

The University provides skills training, careers advice and professional development opportunities. In Archaeology, the Code of Practice for the Employment and Career Management of Research Staff is implemented by providing every academic staff member with a mentor with whom they discuss research priorities and plans. New staff members have a five-year probationary period during which they have a reduced lecturing and administrative load. ECR's are closely supported by mentors with whom they have a formal annual review. Mentors assist in developing applications, monitoring teaching and administration loads and supporting professional development. All full-time members of staff have a guaranteed sabbatical and can take one term in seven as research leave and must submit a proposal for their research and a report at the end of their sabbatical.

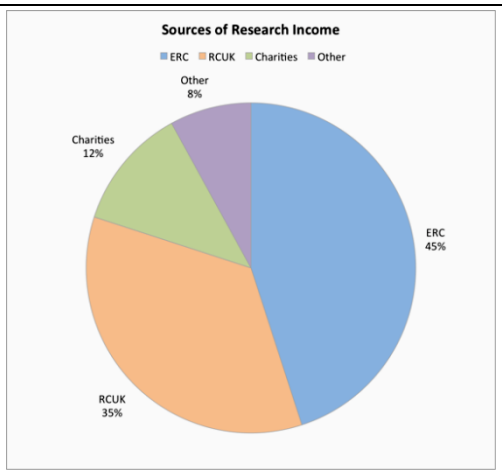
ii. Research students

Our postgraduate community includes 120 doctoral students, one of the largest cohorts in archaeology in the UK. In 2012-13, 34% were from the UK, 22% from the EU, and 44% from 14 non-EU countries. 90% of our students complete their doctorates in their fourth year or earlier. We have met our aim of increasing the percentage of doctoral students in receipt of substantial bursaries or scholarships, from 15% in 2008 to 25% in 2012-13. This is in part due to an exceptional success rate in the University's Clarendon Awards scheme. Since 2010, the School also awards £15k in bursaries to new doctoral students each year. We regard our research students as one of our main strengths and they play a central role in our research activities. Currently 20 students are supported through research grants, participating in, and adding to, the broader aims of projects. The School typically hosts and subsidizes 14 weekly or fortnightly seminar series each year and we estimate that over 1700 seminars have been delivered within the School since 2008, with many more in cognate areas of Classics, History, Anthropology and the

sciences. Many are given by outside speakers and all involve graduate students, often in an organizing role. For example, the Graduate Work in Progress and Graduate Skills seminars; Graduate Archaeology in Oxford (GAO) Officers organize an annual conference, the proceedings of which are edited and published by the students, with financial support from the School; and graduates also organize special events and colloquia, recent examples include *Byzantine Spain* and *The Archaeology of Crises*.

Graduates are encouraged and helped to present their research at conferences in Oxford and abroad, and £10k p.a. from the Meyerstein Fund is dedicated to this purpose. Students with the School have a strong track record of publishing their research, both from Masters and Doctoral theses, in peer-reviewed journals. Of the post-2008 cohort, over 35 have had work accepted for publication while they were still students. The Social Sciences Division organizes 'Professional Training for Social Scientists', a programme covering a range of skills to help prepare students for academic positions. This is delivered in part through Oxford's ESRC-funded Doctoral Training Centre.

d. Income, infrastructure and facilities



Income: For RAE 2008 our external research income totalled £5,855,500; we have raised this to £9,540,745 during the REF period, an increase of over 50% in research activity per FTE Cat. A staff. We have also diversified our external research income and readily met the aspiration, stated in our 2008 submission, to 'maintain our annual research income at or above £1.5M per year'. This increase in research activity is due in no small measure to our successes with ERC applications, who have awarded us six grants.

Infrastructure and Facilities: The School of Archaeology has three main physical units —the Institute of Archaeology, the Research Laboratory for Archaeology and the History of Art (RLAHA) and the Classics Centre; two of its members hold joint curatorial positions in the Ashmolean and Pitt-Rivers Museums. We also have three Research Centres, two of which are externally-funded: the Oxford Centre for Maritime Archaeology (OCMA), and the Radiocarbon Accelerator Unit, as well as the Oxford Centre for Asian Archaeology, Art and Culture (OCA).

Increasing research income allows investment in our research environment by providing a range of new facilities. We have invested in: A new archaeobotanical laboratory, complete with microscopes, 50" LCD screens and internet connections for viewing microscope output; RTI (Reflective Transformation Imaging) digital imaging equipment to allow the 'virtual' examination of objects; new Total Stations to support archaeological surveys; extension and refurbishment of postgraduate premises at the Institute; and a new part-time teaching post in GIS to support the work of research students. In addition to the Radiocarbon Laboratory, we have a suite of stable isotope mass spectrometers, plus GC-IRMS, capable of compound-specific isotopic measurements. We also have two XRF spectrometers, and two analytical electron microscopes.

The Bodleian, one of the world's most celebrated libraries, provides open-shelf and stack provision for Archaeology (with some 250,000 books relevant to archaeology) and cognate disciplines such as Classics and History; it is one of the UK's few legal deposit libraries and as such is particularly strong in its provision for British Archaeology. The Sackler Library houses one of the UK's largest collections of material related to the study of the Ancient World, including archaeology. Other specialist libraries, such as the Tylor and Balfour Libraries, have holdings on anthropology, ethnology and world prehistory; college libraries all support the School's research activities. University museums, principally the Pitt Rivers and Ashmolean, hold extensive collections of archaeological and ethnographic material, with supporting archives.

These facilities provide a vast amount of material for research and attract researchers from all over the world. We estimate that, since 2008, the School has hosted academic visitors from 14 different countries including Australia, China, India, Iran, Japan and the USA.

Colleges and the Department for Continuing Education also provide important facilities and host archaeological conferences, workshops and short courses, many of international scope, and organized by members of the School (e.g. 'Radiocarbon Dating', Ramsey).

e. Collaboration or contribution to the discipline or research base

The School contributes to the wider archaeological profession in many ways. Lee-Thorp and R.R.R. Smith have been elected members of the British Academy. Since 2008 five members have served on NERC's Peer Review College (Bogaard, Charles, Lee-Thorp, Petraglia, Ramsey); Ramsey is a member of the NERC-AHRC Radiocarbon Facility panel, for which Higham acts as Secretary. Gosden serves on the AHRC Academic Advisory Board and the ESF Humanities Board. Morley participated in the Cross-Parliamentary Policy Group on Education and Mitchell acted as Senior consultant to the government of Lesotho on the Metolong Cultural Heritage Project. Gosden is Chair of the Trustees of Oxford Archaeology (Hamerow is also a Trustee), the largest independent archaeological and heritage practice in the UK, and is a Trustee of the Art Fund. Griffiths is involved in professional development in his role as Director of Professional Training in Historic Environment for the Dept. of Continuing Education and also, via its partnership with English Heritage, for the Institute of Field Archaeologists. Schulting has contributed to English Heritage's National Research Frameworks for England and Wales. Petraglia is member of UNESCO's Programme, 'Human Evolution', informing nominations for the World Heritage List.

The School also contributes to the discipline by maintaining several major databases: i) OxCal database; ii) OxALID (Oxford Archaeological Lead Isotope Database); iii) RESET database; iv) Gallo-Belgic Pottery in Britain; v) Egyptian Radiocarbon Database; vi) The Celtic Coin Index; vii) *Novum Inventorium Sepulchrale:* viii) Anglo-Saxon Gravegoods from Kent; ix) The Jacobsthal Archive. Together these underpin research in a considerable range of areas and topics and is a function we wish to increase in future, for instance through current large-scale projects.

The School pub**li**shes 6 journals and periodicals (*Oxford Journal of Archaeology* (Cunliffe, Gosden, Hamerow)*, Archaeometry (*Pollard), *Anglo-Saxon Studies in Archaeology and History* (Hamerow*), Azania: Archaeological Research in Africa* and *Asian Archaeology* (Mitchell)) as well as a Monograph Series dedicated to the dissemination of archaeological research at Oxford (16 volumes published since 2008).

Members also edit major monograph series: 'Medieval History & Archaeology' (Hamerow, OUP) and 'Image & Context' (Smith, De Gruyter)). OCMA's new monograph series (Wilson) has published 5 volumes, and the Oxford Roman Economy Project (Wilson) has launched a series with OUP, *Oxford Studies on the Roman Economy*, with 6 volumes published since 2008. Members also edit 3 external journals: Lee-Thorp, *J. of Human Evolution*; Higham, *J of Human Evolution, Quaternary Geochronology*.

Sixteen members serve on the editorial boards of 29 journals, including; *World Archaeology* (Bogaard), *Antiquity (*Gosden, Mitchell*), Proceedings of the Prehistoric Soc* (Gosden), *Medieval Archaeology* (Griffiths), *Spanish Jl of Medieval Archaeology* (Hamerow) *J. Archaeological Method and Theory, J Quaternary Science, J of African History* (Lee –Thorp), *Before Farming, North American Archaeologist* (Petraglia), *Radiocarbon, Quaternary Geochronology* (Ramsey), *Artibus Asiae* (Rawson), *Mitteilungen des Deutschen Archäologischen Instituts (*Smith*).*

Key national and international collaborations include RESET (RHUL, Southampton, the Natural History Museum), the Suigetsu Project (includes Newcastle, NERC, Postdam, Tokyo), China and Inner Asia (includes British Museum, Peking Uni., Institute of Archaeology, Moscow), Morocco Caves Project (Institut National de Science, Rabat), English Landscapes and Identities (English Heritage, HERs, PAS), Herculaneum Sewer Excavation (British Schoool in Rome), Interpersonal violence (Universities of Copenhagen and Hamburg), Evolutionary Origins of Agriculture (Sheffield & Manchester Universities); Toba (Universities of Karnatak and Allahabad), SeaLinks (ANU, Kerala, Archaeology, Sri Lanka, National Museums, Kenya); Metalong Dam project (Oxford Brookes, Universities of Toronto, Wollongong, Johannesburg, Lesotho & Witwatersrand), Miletus Excavation (German Archaeological Institute), Aphrodisias Excavation (NYU). OCMA has facilitated international collaboration between the *Institut Européen d'Archéologie Sous-Marine* and the Supreme Council of Antiquities of Egypt.