Institution: University of York
Unit of Assessment: 17 – Geography, Environmental Studies and Archaeology

a. Overview

Archaeology at York presents a model for the integration of science and the humanities. The Department comprises five research clusters across both fields: BioArCh (collaboration with Biology and Chemistry); Digital archaeology (led by the Archaeology Data Service); Prehistory; Proto/Historical archaeology; and Heritage & Conservation. Research clusters are open and self-selecting, and staff and PGRs may belong to one or more groups. This UoA submission covers the whole of Archaeology at York, including Hull York Medical School (HYMS) staff who are founding members of our Centre for Human Palaeoecology & Evolutionary Origins (PALAEO). Research is supported and driven by a single Research Management Team (RMT). All staff are allocated a minimum of 40% of their time for research regardless of individual grant income.

b. Research Strategy

In RAE2008 we identified six Research Objectives (RAE1-6):

RAE1 New directions in historical archaeology: New appointments (Schofield, Symonds, Perry) have driven debate on the role of archaeology in understanding the present. Studies have included poverty, homelessness, graffiti and war art, Cold War installations, 20th-century astronomy, post–industrial landscapes and anti-Soviet movements.

RAE2 Strengthening research in Europe/Africa, expanding presence in Asia/Americas: New appointments have strengthened research in Europe (Sindbaek, Mundee) and Africa (Wynne-Jones). The collaborative *ENTREPOT* project (3 York staff) is rethinking inter-continental exchange networks in early medieval Europe, Africa and South Asia, whilst the *EUROTAST* training network (3 York staff) combines historical, archaeological and biomolecular approaches to explore the impact of the transatlantic slave trade. New research in Asia (Craig) will expand with the appointment of Saul (2013) working in Nepal.

RAE3 New directions in bioarchaeological and biomolecular research: BioArCh has grown by 4 staff (Mundee, Saul, Holland, Von Tersch) and is integrating bioarchaeological analyses into conventional archaeological investigation. *Palaeolithic spotted horses*, *Kent's Cavern hominid* (2011) and *Neanderthal Medics* (2012) were all identified globally as top 10 discoveries.

RAE4 Field & analytical projects as drivers of research and collaboration: Our £1.3m+ EC-funded field project at Star Carr exemplifies our commitment to this approach, promoting the career of the PI, building a 20+ research team and collaborating with 8 UK institutions. Major analytical projects are key drivers in our bioarchaeological research (e.g. lipid analyses of pottery).

RAE5 Stronger inter-UoA links: We worked with the new Humanities Research Centre (HRC) to establish joint centres of research excellence. An exemplar is the *Centre for Digital Heritage* which is led by Archaeology (Director: Richards) incorporating researchers from 7 units and international partners. The Centre will play a key role in the €8m European-funded *ARIADNE* project.

RAE6 Research networks capitalising on international collaboration and funding: >75% of competitive research grant income in 2008–13 derives from overseas sources compared with <25% in the last assessment period. We have led major collaborative research projects (e.g. *DISPERSE* (£2m+) led by Bailey and co-directed by the Institut de Physique du Globe, Paris, in collaboration with researchers from Australia, Greece, Kenya and Saudi Arabia).

> Our success in the census period was recognised with the Queen's Anniversary Prize in 2011 for "*Leading-edge work in archaeology from prehistory to the modern age*"

Main objectives and activities for future research and their drivers
Underlying Drivers: 1. **The historic environment** is a key social and economic asset and a resource for learning and enjoyment. Archaeology offers a unique perspective on its use, sustainability and conservation over the long term. New methodologies and pioneering research into radical shifts within environmental conditions and human responses will inform contemporary debates and conservation. **2**. **York** is a *'heritage city'*, attracting over 7m visitors annually with a

major concentration of expert capacity in archaeology and heritage management and excellent collaborative potential. **3**. **Digital** technology and the creation of 'born digital' content are central to modern archaeology. As Cultural Heritage professionals, we need to establish how these technologies can best serve the creation of sustainable records, inform analysis and curation strategy, and enable new and powerful forms of access and engagement. 4. **Bioscience**: New *genomic analyses* are revealing the diversity and evolution of people, plants and animals as well as unravelling microbial ecosystems. *Imaging, morphometric*, and *virtual simulation* methods for the analysis of skeletal form and function are also providing new insights into evolutionary history, migrations and lifestyle. These new technologies open up entirely new paths into the past, expanding the reach of archaeology into other discipline areas.

Our **five year research plan** identifies four specific **R**esearch **O**bjectives:

RO1: pioneering research into the historic & natural environment, its management & sustainability.

RO2: to be a centre for the interpretation and management of cultural heritage around the world, using collaborative work in York and elsewhere as models for sustainable global practice.

RO3: to develop new digital methods to make archaeological data sustainable and accessible.

RO4: to effectively integrate the latest bioscience technologies into archaeological science.

In order to maintain a thriving and sustainable research environment our research plan commits us to: Support all researchers to develop their own individual research profiles; attract outstanding Early Career Researchers to York; encourage collaborative research projects, and target investment in relevant infrastructure. Our RMT will monitor achievement of these objectives by tracking:

● Number of independent research fellows and graduate students, high quality research outputs, media coverage, policy papers, international research income (RO1).
● Number of new collaborative projects linking agencies, numbers of collaborative applications, contributions to national and international forums (RO2).
● Number of accesses of ADS website (>2M page views in 2012/3), downloads of data, and examples of data-reuse (RO3).
● Numbers of collaborative outputs using bioscience data to answer archaeologically meaningful questions, numbers of new projects using bioscience data (RO4).

The RMT is responsible for compiling data on research awards, estimating research success and benchmarking against other Archaeology Departments, for both the Departmental Management Team (DMT, research income) and Departmental Research Committee (DRC, research benchmarking). DMT is responsible for monitoring resource requirements and maintains a portfolio of resource requests, which it assesses annually. In addition to benchmarking data, the DRC monitors submission and success rates of grants, sabbatical plans, and pump priming funds. As the above table shows, this has allowed us to monitor applications and achievements, and to target those areas deserving of additional future support (e.g. *Heritage*, see below).

Research group	Digital	Bioarch	PreHist	Pro/Hist	Heritage
Books	2	2	2	5	4
Edited Volume	0	1	4	2	4
Chapter	36	49	49	71	20
Journal Article	17	180	107	66	36
Other	12	48	10	13	10
Awards (£k)	£1,589	£3,368	£1,117	£1,589	£3

New and developing initiatives: As part of RO2 we are strengthening the research arm of our internationally recognised taught Conservation program, through integration with the *Heritage and Buildings* cluster to create critical mass. We have appointed a new Director of Conservation (Chitty) who brings a wealth of practical experience from her previous role as Head of Policy with the CBA. A new partnership with the Weald & Downland Open Air Museum (2012) provides further scope to explore joint working in community conservation practice and buildings archaeology. We will work with the recent *INTACH* initiative established by Piplani (2008-2012), to strengthen co-working between India and York's international conservation and crafts specialist network.
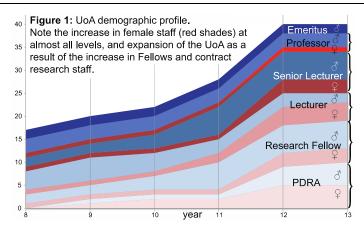
Priority developmental areas for the unit: We will continue to foster research topics which map onto our key research objectives. As a crucial part of this, we will encourage the pursuit of longer/larger awards from RCUK and International bodies, seek collaborative funding in support of community action and emphasise links with industry and the third sector. An important dynamic in postgraduate research will be provided by studentships with external partners and more joint outputs involving PGRs and staff. We are also developing new facilities, among them the rehousing of BioArCh in new accommodation in the Bioscience cluster, a new ancient DNA laboratory (with Biology), and the creation of additional space for Early Career Researchers at King's Manor. These science-based developments are complemented by plans to make greater use of the HRC on campus as a centre for inter-disciplinary collaborations across the Arts and Humanities. In terms of staffing, we will make a new lecturer appointment in 2014 to increase critical mass in the analysis of ancient DNA, and will support the hiring of additional bioinformatics support within the bioscience cluster. Our administrative and management structures are now *fit for purpose*, and our key concern in these areas will be to increase managerial experience across the Department by developing management teams to replace individual roles.

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c. People, including: I Staffing strategy and staff development

Staffing policy & evidence of its effectiveness

New posts in the census period were identified by DMT guided by our RAE2008 strategy, with individual staff recruitment based on research excellence and collegiality. RAE1, Ashby 2008; McClain 2008; Sindbaek 2008-13; Wynne-Jones 2009. RAE2, Fitton 2011; Mundee 2012; BioArCh research administrator Holland 2009; BioArCh technicians Allen 2008–12/von Tersch 2012. RAE3, Schofield 2010; Chitty 2012; Perry 2012. In order to recruit

Figure 1: UoA demographic profile. Note the increase in female staff (red shades) at almost all levels, and expansion of the UoA as a result of the increase in Fellows and contract research staff.

the best staff, the Department aspires to appoint on open contracts, and has achieved this over the review period. One fixed term contract in the census period (Saul 2013) covers maternity leave. Joint appointments were Symonds 2010 YAT fellow with History (RAE5) and Luqin 2013 MC Fellow with Chemistry (RAE3). The success of our strategy is reflected in the achievement of goals outlined in RAE2008, by the maintenance of our strong collegial atmosphere (over 36% of all outputs in the census period were joint publications with other UoA staff), and by the continued research activity of staff in heavy admin roles (e.g. Richards, Collins). During the census period (i) three staff have resigned, (ii) there have been more than 30 unsolicited requests to join the Department and (iii) more than 100 ECRs have approached us to host Fellowships. Those that leave or retire remain in some way associated with us, thereby enhancing research activity (e.g. Sindbaek's *ENTREPOT* project and Piplani's initiative with *INTACH*). There have been two key changes to the staff profile over the census period: an increase in (i) Senior Lecturers and (ii) ECRs (Fig. 2). Sustainability and succession planning are both strengthened by the recruitment, promotion and retention of junior staff and by continued involvement of all emeritus Professors in the research community. A more even balance of seniority has encouraged the involvement of more staff in the research management process. The increase in holders of prestigious fellowships (8 Marie Curie & Royal Society) contributes to the vitality of the UoA, while our contract research staff expand the range and depth of research that PIs can accomplish. Our policy for honorary staff (e.g. Prof. Jo Fletcher, Malin Holst) has ensured a further broadening our research and skills base. The Departmental Management Team is responsible for reviewing staffing policy against our research strategy. Areas such as heritage and conservation (RO1&2) digital archaeology (RO3) and bioarchaeology (RO4), are core strengths but outside of these our policy enables us to identify the best individuals at any time and to adapt our research agenda to suit.

Equality of opportunity: We employ a transparent workload model to ensure that administrative and teaching loads are balanced as fairly as possible. The model gives weighting for grant applications in addition to the designation of two days for research per week. This has led to a 40%

increase in the number of applications submitted compared to RAE2008. All staff have taken their preferred Pa/Maternity leave. During the assessment period 6 members of staff have been promoted: 5 from Lecturer to Senior Lecturer (3 male, 3 female), and 1 from Senior Lecturer to Professor (female). We have established a committee that meets annually and advises staff on how to plan for promotion and ensures equality of opportunity. We are currently applying for an Athena Swan Bronze award in recognition of our role promoting female members of staff (Fig. 2). We support part-time and flexible working enabling, staff to balance work with family commitments. Every member of staff gets one term in seven of study leave.

The UoA supports the implementation of the *Concordat to Support the Career Development of Researchers*. Recruitment and selection are open and researchers are chosen for their ability to advance research. To encourage the highest quality candidates to York, since 2011 we have offered an annual £1k prize for the best independent Fellowship application, with applications vetted by all members of staff. There is an induction programme for new researchers that has recently been restructured by existing ECRs. Researchers are encouraged to integrate in the UoA through involvement in research groups, teaching and, where possible, PhD supervision. We support researchers to engage in their own personal and career development through membership of the Concordat Implementation Steering Group (Elliott), DRC and Board of Studies (Inglis). The central Learning and Development team provide training for researchers covering three themes: (1) engagement, influence and impact; (2) personal effectiveness; and (3) research governance and organisation. All PIs undertake a Research Leaders programme to effectively implement the principles of the Concordat; this course won the THE Award for *Outstanding Support for Early Career Researchers* in 2012. An ECR Coordinator assists where appropriate. Evidence of the positive influence of the implementation of the Concordat lies in the destinations of past researchers: Neal, Wright and Saul were recruited to the UoA, Stump has been awarded an ERC Starting Grant (due to start at York in 03/14), von Hellerman, Tache, and Hardy are in academic positions. The University HR *Excellence in Research* badge has been renewed for 2013 in recognition of its alignment with the principles of the European Charter.

Mechanisms by which standards of research quality and integrity are maintained: We comply with the University's *Code of Good Practice for Research*. This includes principles of good research, the research process, ethical considerations, conducting research, publishing results and academic misconduct. Under the guidance of the University Ethics Committee we operate a devolved Ethics Committee comprising two members of staff and one layperson. Ethics procedures are set out on our intranet and a flow diagram is provided to guide staff. Students undertake an ethics assessment of their project and potentially sensitive initiatives are reviewed by our Ethics Committee and signed off by the Director of the HRC.

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c. II.   Research students

Research students: In 2008–13 we have hosted the following prestigious and competitive studentships: AHRC CDA (9) AHRC (7), NERC CASE (3) standard NERC (2), EU Marie Curie ECRs (3) and co-supervised a further 4 NERC-funded studentships with Biology and Chemistry. CDA and CASE awards build and strengthen relationships with sectorial partners which feeds into RO2 (e.g. Wadsley, Fera, see REF3b 1); Marie Curie studentships, which are part of an international network with a single research focus, offer increased opportunities to enrich research investigation through additional data, results and techniques (e.g. Hendy, access to St Helena slave ground); NERC students are able to access any NERC services and facilities (e.g. von Holstein oxygen isotopes at East Kilbride). Prestigious and competitive studentships also contribute to the wider PGR culture of the UoA by enabling staff and other students to access funder-run events/workshops (e.g. the EUROTAST workshop in York enabled Finch to expand his work on links between British and West Indian Estates).

Evidence of a strong and integrated PGR culture: PGR students organise our public Seminar Series, and run conferences (e.g. *Archaeology of Destruction*, BABAO2013), and field projects. Their well-reviewed Yorkshire Archaeology Postgraduate Conference has already led to new research collaborations. The *Teffont Archaeology Project* has been active throughout the whole of the census period, growing from a limited survey-based study into a full academic and community endeavour. Funded by a range of external agencies, the UoA and the student society (ArcSoc), the project includes a substantial field school for York staff, students and other volunteers. Rachael

Kiddey's *Bristol Homeless Heritage Project* (Vice Chancellor's Gold Award for Inclusivity, shortlisted by the THE for Widening Participation Initiative of the Year, 2012) spawned a second project in York, community digs involving students, staff and homeless volunteers in York, a public exhibition and widespread interest from the third sector in developing the initiative. The University's investment in the HRC has encouraged cross-disciplinary research collaboration. This is highlighted by the *Sensory Stories Project*, featured as a case study by the AHRC on their website and involving PGR students from four departments. Within this, Elliott worked with the Northern School of Contemporary Dance, and was subsequently awarded additional funding from the *York Festival of Ideas* to work with sound artist Jon Hughes to construct Mesolithic soundscapes for a year-long exhibition at the Yorkshire Museum. This work has gone on to enrich the outreach of and informed research within our current ERC *POSTGLACIAL* project (see REF3b 2). Student innovation expands research capability; for example, John Stewart's PhD invention which enables rapid identification of archaeological eggshell fragments will be transferred to other institutes within a multi-partner 5 yr AHRC *Science in Culture* award. The vibrant student research culture at York is evidenced through the high number of co-publications with staff (71 in census period) and the student-run journal *The Posthole*. The journal, indexed by Google Scholar and now in its 31st Issue, is the premier student-run archaeology journal in the UK with coordinators at Cambridge, Durham, Nottingham, Reading and Southampton.

Support offered to PGR including employability: The University's Research Development Team offers research and transferable skills training and comprehensive online resources, which are complemented by specialist offerings from the UoA, including an extensive online student handbook. Students who want formal recognition of their training can join the York Award: Researchers Programme. In order to prepare for the workplace, all students take the online Employability Tutorial and develop a Professional Development Plan as a requirement for their confirmation of registration (upgrade). We work with central careers officers to provide tailored employability provision. For example, those intending to become academics (the majority of PGRs) can enrol on the Preparing Future Academics programme, which includes supervised teaching, and whose graduates are eligible for membership in the Higher Education Academy. In addition, we implemented in 2011 a Postgraduates Who Teach (PGWT) programme in which research students have the paid opportunity to develop their skills as future academics by teaching on UG programmes. This has the added benefits of increasing staff research time, and feeding back new innovative teaching methods to staff at a workshop run by PGWT students. PGR representatives are also encouraged to participate in management committees, research group meetings and weekly research seminars.

Postgraduates are supported to apply for external funding as well as three separate internal funding competitions: (i) conferences and pump-priming, (ii) Open Access Publication, and (iii) Data Curation (total £8,000 pa). The pilot data generated by internal awards is expected to result in larger external bids, e.g. PGRs have authored external awards totalling £83,000 from RCUK over the course of the assessment period.

Contribution of submitted staff to doctoral program All staff contribute to supervision of PGRs and most co-supervise or chair additional students. The design of the Thesis Advisory Panel, consisting of a primary and at least one secondary supervisor, plus an independent chair, encourages cross-disciplinary consultation. In addition, Richards will chair the new AHRC White Rose College of the Arts & Humanities, and Giles chairs the Board of Studies for the Centre for Medieval Studies: the largest of the Humanities interdisciplinary research centres, shared with three other departments.
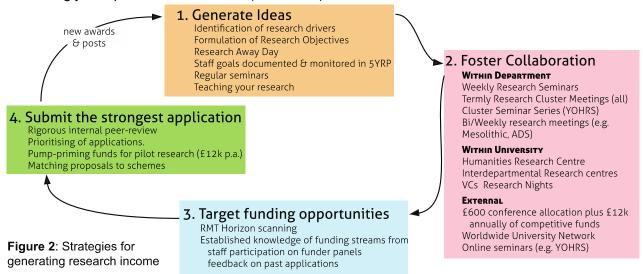
d. Income, infrastructure and facilities

Research Funding in 2008–13 has generated a current portfolio of projects worth over £10M, of which 10% are part of larger research consortia (RAE6). Together these larger research consortia translate into over £40M of funding won by us and our partners for archaeology and allied subjects over the census period (>£1M awards from AHRC, EPSRC, Danish Research Council and EU). 70% of the remainder are prestigious awards from the ERC. We have so far been awarded more of these than any other UoA in the University, including two Advanced Awards *InterArchive* (RAE3) and *DISPERSE* (RAE2), and *CodeX* (RAE3). The UoA has won two ERC Starting Grants *POSTGLACIAL* (RAE4), *AREA* (RAE2) and one of the scheme's precursor grants, the Marie Curie Excellence Award (*HEEAL*; RAE2). As illustrated by the *'excellent'* assessments of *HEEAL* and

LeCHE (the latter also covered by a three-page spread in *Nature*, 08/13) our involvement in larger scale projects allows us to tackle new research questions on broader scales, with more diverse techniques and datasets. Larger scale grants also offer opportunities to build and lead research teams adding to our vitality and contributing to the career development of the participants. The success of this model is exemplified by the *HEEAL* project which led PI Paul Lane to a professorship at Uppsala and the award of a Marie Curie ITN (**R**esilience in **E**ast **A**frican **L**andscapes RAE2) that will sustain collaboration with York's Environment department, and Early Career Researcher Daryl Stump's ERC Starting Grant *AREA*.

Strategies for generating grant income appropriate to the discipline: are illustrated in Figure 2. Evidence for the success of this approach has been our ability to maintain research income in an increasingly competitive environment (see REF4).

Figure 2: Strategies for generating research income

Infrastructure and/or facilities supporting a vital and sustainable research environment: The UoA implements its strategy through the provision of a vibrant and well supported research environment. In IT we have led a move towards cloud-based services using the *Google Apps for Education Platform*. Alongside collaborative tools for research and upgraded AV links between sites, this has facilitated our online research community and provides a database of research opportunities. It has 42 active members from the UoA and the idea is being copied across the University. In our physical environment we provide and monitor requirements for space (e.g. for PGRs and research groups) equipment and facilities. In line with our RAE2008 strategy and in support of our research objectives, we have invested £300k+ in equipment (e.g. Laser Scanner, IRMS; RAE3) and facilities (upgrading geoarchaeological and ancient DNA laboratories; RAE4, 5) as well as £70k+ on new ADS file servers. Our technical facilities are supported by 8.2 staff. In addition to £12k for pump priming, staff have access to funds to support competitive bids for Data Management and Open Access Publication (each of £5k). Under the guidance of the DRC, we provide essential organisational support for research through a dedicated four-member Research Management Team who organise our research Awaydays and benchmark research income and advise the DMT to enable them to create and monitor 5-year targets. The RMT also meet with every member of staff to help guide the formulation of their individual 5-year research plans (5YRP) and conduct horizon scanning of targeted opportunities for funding and collaboration linked to individual 5YRPs. This also involves help with costing, submission and the management of awards, the maintenance of funding records, web pages and the example applications library. We also use central University mechanisms to support research activity by providing facilities and professional support; developing an intellectual environment conducive to unfettered interactions among researchers; and making time available in useful blocks. Examples include:

- £20M Library refurbishment: The Borthwick Institute for Archives and an agreement to use York Minster Library enable staff to access to a wealth of unique collections and resources, e.g. the use of urban spaces (Giles), dated parchment for biomolecular analysis (CodeX, Fiddyment). The exemplary special collections and commitment to supporting research were recognized with an invitation to join Research Libraries UK in 2012.
- A shared Technology Facility (with Biology and Chemistry) including £3M investment in the new Centre for Excellence in Mass Spectrometry (RAE3)
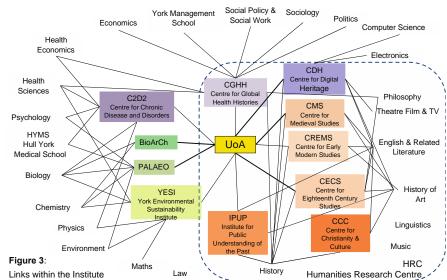
- Research Innovation and Research funding teams notably an expanded provision for EU support and support for research activity within the Worldwide University Network (RAE6)
- Priming funds for research and costs for visiting scholars (RAE6).
- Development Fund for Early Career Lecturers, e.g. McClain(2012) was awarded an additional term of research leave and a travel grant for field research
- Anniversary Lectureships; Craig (2012) was supported to develop collaborations in Japan, submit three major grant applications and produce a REF output (Craig 1).

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e. Collaboration and contribution to the discipline or research base

Interdisciplinary Research: The University and UoA place a strong emphasis on supporting and investing in interdisciplinary and collaborative research, both providing seedcorn funds. Centres provide the focus for interdisciplinary research within the University, the flat structure of which (no faculty boundaries) supports this approach (Figure 3). This is exemplified by the establishment of BioArCh (which integrates Biology, Archaeology and Chemistry

Figure 3: Links within the Institute

and shares staff and facilities with each). Financial autonomy enables BioArCh to host the ERC award InterArchive and the NERC recognised amino acid geochronology facility across two departments, and support project students from all three. We collaborate with all 8 humanities departments and in 2009 £11m was invested to build the HRC which provides a hub for interdisciplinary research (Fig. 3), support staff for collaborative projects and shared workspaces to encourage interdisciplinary dialogue (RAE5).

*Existing networks and clusters with industry, commerce, third sector and other users***:** York's rich heritage is one of our greatest assets, and we foster our connections to the city via many links. These include Board membership of the *Civic Trust* (Giles, who is also Archaeologist for *York Minster*) and the city-wide *York Archaeological Forum* (Chair: Roskams). Collaboration with local partner organisations provides the basis of much research outside the academy, and we play a crucial and valued role in developing research questions, offering specialist expertise, financial support (e.g. 6 CDA and CASE studentships), innovation and material. For example, by developing a policy for long-term curation of bone remains, and new GIS tools with YAT, we not only enhance the value of their archive but enhance access for our own research. Beyond the city we have co-ordinated 4 major international networks involving non-academic partners (RAE6). For example, Bailey chairs a 4-year *COST* network involving archaeologists, marine geoscientists, heritage agencies, and commercial and industrial organizations from 25 European states developing global research collaboration on submerged landscapes. The success of this initiative is reflected in the securing of a call for an additional €6M of funding for future research in this area. Following the completion of the *EVAN* network, its members formed the EVAN-Society e.V., a non-profit organization to promote Virtual Anthropology and provide access to infrastructure (EVAN Toolbox) and digital data from specimens (EVAN Archive). The development of ZooMS has led to a range of commercial collaborations (i) with the multi-national verification company **SGS S.A.** to develop new tools for assessing levels of purity of cashmere, (ii) with **AgResearch NZ** to identify unique breed markers in wool, (iii) we are helping **Pergamena** a small US parchment producer, to re-create ancient techniques and (iv) we are helping the **Food and Environment Research Agency** (Fera) to develop new methods for detecting horse gelatin. These collaborations have resulted in access to rare samples, and proprietary databases, whilst a *Fera* quality assurance audit has tightened our laboratory procedures.

National academic collaborations: We have been in the vanguard of the trend for cross-institutional provision as evidenced by our partnership with the Centre For Medical Engineering and Technology (Hull) and the White Rose University Consortium. The WRUC (est 1997) provides funds for cross-institutional collaboration and a data repository, and forms the basis of a plan for PGR provision. The White Rose College of the Arts & Humanities (WRoCAH) is a major AHRC Doctoral Training Partnership with Leeds and Sheffield. Strong links with other regional Universities are evidenced by our membership of N8, and joint publications which evidence our shared access to specialist research facilities (notably at Bradford and Hull). 29% (248) of our 859 outputs in the census period have been published with UK colleagues and £3m of our current research portfolio involves national collaborations, for example our analytical contribution to the "*Feeding Stonehenge*" project led by Parker-Pearson, UCL) has led to a new Fellowship (Luqin, with chemistry). The NERC recognised NEaar facility (RAE3) has provided geochronological data for more than 14 UK collaborators and has helped the UK develop the most robust Quaternary chronological framework in the world.

International academic collaborations (RAE 6): Staff are on the managing boards of 6 international programs. We have hosted 10 distinguished international visitors, while staff hold formal posts with overseas Universities (Collins, Schofield, Symonds), Lane (Uppsala), Sindbaek (Aarhus) and Hofreiter (Potsdam) still maintain active engagement with the Department. 28% of our outputs in the census period have been published with international colleagues. 68% of staff (30% of funding) are involved in 26 International Research Networks, Projects or Groups (e.g. Stone Age Bog Network) involving a total of 36 countries notably in the areas of Prehistory, Medieval, Digital and Bio-archaeology. Our RAE2 objective (Africa) has grown into research programs in Ethiopia (with Pretoria), Kenya (with Kenyatta U) and Tanzania (Arizona; Rice U., UCT, Dar es Salaam U.). A long-standing link with the latter is maintained through former students (e.g. Biginagwa, now lecturer). Our Africanists have attracted >£8M in funding (EU, AHRC, NSF, BA, Soc. Antiq.), helped establish research facilities (e.g. GIS lab at UDSM with UCT) as well as being active in academic service in Africa (e.g. BIEA, SAfA). The ADS has been a lead participant in six networks during the census period (€10M total funding involving 27 institutes) enabling the UK to be a lead driver in digital heritage, enabling us to benefit from the latest innovations and ensure the UK adopts best practice.

Contribution to the discipline is detailed in the Table below. Highlights include (i) the role of three staff on ERC panels, (ii) Carver as editor of *Antiquity* (2003-12) managed the digitisation of the journal and its move to a hybrid open access publication, (iii) Piplani (2008-2012) established the *INTACH* Centre for Conservation Training and Capacity Building in India, and was awarded the Glory of India Award in (2012) for his exceptional contribution to cultural heritage conservation, (iv)

Research group 2008-13	Digital	Bioarch	PreHist	Pro/Hist	Heritage
Conference organiser	2	3	6	8	2
Keynote speakers	5	8	8	9	5
Invited speaker	13	20	42	88	13
Other conference participation	1	4	8	28	1
Journal editor/editorial board	3	2	6	15	3
Seminar series				4	1
Contribution to CPD	2	1		8	4
Membership of professional associations/ learned societies	7	7	10	27	7
Contribution to other developmental disciplinary initiatives	9	12	6	7	12

O'Higgins runs specialist workshops in Geometric Morphometrics for academics and professionals in UK, Europe, Americas and Russia, founding board member of the European Society for Human Evolution and was awarded the Rohlf Medal in 2013), (v) the UoA is running a unique project (Norton) to support and encourage the integration of craft skills for conservation in mainstream construction apprenticeships (commended: *Heritage Angels,* 2013) and design building conservation masterclasses attended by professionals, SME's and national bodies, (vii) Richards' role in helping to establish equivalent facilities to the ADS in the USA and Australia, (vii) the UoA's contribution to the wider discipline was recognised in 2011 with our award of the Queen's Anniversary Prize.