

Institution: University of Liverpool

Unit of Assessment: 15 Archaeology

1. Unit context and structure, research and impact strategy

1.1 Overview

The University of Liverpool pioneered integrated research into the ancient world with the creation of the Institute of Archaeology in the early 20th century. Today, the Department of Archaeology, Classics and Egyptology (ACE) embodies that interdisciplinary tradition in a single integrated submission with 35.6 FTEs (contrasting with 2014's return of two units, Classics and Archaeology). With regional interests across Eurasia and Africa, our researchers address the fundamental question of what it means to be human, provide deep-time contexts for our impact and contribute to contemporary global issues exemplified by the UN Sustainable Development Goals (**SDGs**).

Through 8 Research Groups (Section 1.2), we investigate key developments in the history of humanity and fundamental aspects of social life over the long term, making major contributions to understandings of: human evolution and the coevolution of plants and animals; human-environment interactions; the transition to sedentism and agriculture; inter-related developments of households and communities; understanding and experiences of the body; ancient world literary traditions; histories of language development and subsequent receptions of ancient worlds in later periods. These research foci benefit from the integration of work on ancient languages and texts alongside archaeological approaches to western Eurasia's ancient civilisations. The scale, integration and objectives of our Research Groups will ensure they remain key vehicles for delivering our strategies into the next REF cycle.

ACE's physical unification into one building (2015) and the resulting intensification of interactions between staff has realised our longstanding objective to capitalise on our diversity. Alignment heightened our collective awareness of gender and BAME disparities, leading to a sustained joint effort to address these issues. A new **Equality, Diversity and Inclusivity (EDI) strategy** (Section 2.1.3) is now embedded in our research and impact structures and forms a key component of our longer-term sustainability strategy, recognising the importance of staff well-being to our continued success, leading to new approaches for staff recruitment. These ED concerns also inform our interactions with non-academic partners and beneficiaries (Section 4), ensuring a strong platform for development beyond the current REF cycle.

Departmental integration enabled the re-development of a **Research Committee** with a broader vision. The Committee plans strategic changes to Research Groups, oversees the Research Conversations cycle (Section 2) and promotes our Open Research strategy (Section 1.3). The Committee has a balanced female/male membership and includes subject leads, PGR director, ED lead, Impact lead, and ECR and PGR representatives. Its Director brings forward institutional policies and agendas, particularly from our parent School of Histories, Language and Cultures. The School offers financial support for individual and group initiatives, notably research and impact themes reaching across Departments and Faculties (Section 2). The Committee's remit, composition and capacity for strategic development will continue to enhance delivery of our income generation and research collaboration aims from 2021 onwards.

Working with international collaborators, we also translate our research into contributions to society. Participation in and leadership of the University Heritage theme (see REF5a; 2.3) promotes interdisciplinary collaboration, aiming to realise tangible impacts for the benefit of non-academic partners and stakeholders (Sections 3-4). Within this broader framework our strategy focuses on:

- (1) The preservation and enhancement of UK and international museums and heritage sites
- (2) Enriching educational provision in schools in the UK and internationally
- (3) Preserving heritage under threat in areas impacted by conflict and related social disruption
- (4) Informing local communities, public discourse and global audiences.

Collectively our strategy addresses SDGs 1, 3, 4, 5, 11, 12, 16 and 17: **No Poverty; Good Health and Well-Being; Quality Education; Gender Equality; Sustainable Cities and Communities; Responsible Consumption and Production; Peace, Justice and Strong Institutions; and Partnerships for the Goals**. Research Groups (Section 1.2) and Research Conversations (Section 2.1.1) provide contexts for pursuing our goal of contributing to SDGs as part of a broad impact portfolio.

In summary, our research aims to:

- deliver multi-dimensional research and impact addressing global issues (Sections 1.2 & 4.1, 4.4)
- transcend disciplinary and national boundaries (Sections 1.2, 4)
- engage with wider societal issues (Sections 1.2, 4).

Our research strategy has enabled us to:

- expand our research base, underwriting long-term sustainability and vitality (Section 2)

Unit-level environment template (REF5b)

- increase research and impact income (Section 3)
- encourage and support interdisciplinary collaborations nationally and globally (Section 4).

Notable milestones resulting from implementation of our strategy include:

- University investment in 4 new permanent posts (Dobney, Foxhall, Nugent, Perale)
- research grants bringing 3 additional T&R staff (Escolano-Poveda, Hommel, French from Sept 2020) (Sections 1.2, 3.1.1)
- recruitment of 8 prestigious ECR awards, 5 Leverhulme Early Career Fellowships (ECF), 2 Marie Skłodowska-Curie Fellowships, and 1 UKRI Future Leaders Fellowship (Section 2.2)
- recruitment of 5 PDRAs (Sections 2-3)
- University investment of £2m in dedicated archaeological laboratories and support staff (Section 3.2)
- 108% increase in grant income between REF2014 and REF2021 from £1.58m to £3.29m, with a total award value of £5.35m (Section 3.1)
- 45% increase in PGRs completed from 52 to 77 with an additional 70 PGRs starting doctoral research during the census period (Section 2.2).

1.2 Research Groups

Our Research Groups integrate staff and PGR research across ACE, providing lively, intellectually stimulating settings for cooperative development of projects, funding bids, outputs, inter-disciplinary activity, and collaboration with non-academic beneficiaries. They are: **Human Origins, Human Palaeoecology, Egyptology, Households and Communities, Ancient Economies, Literary Cultures of the Ancient World, Receptions, and The Body**. With 33% of staff involved in more than one Research Group, the productivity and vitality of this strategy is well-evidenced in all areas of activity, outlined here and in later sections. Supporting PGR and ECR development is a key Research Group function, enabled by collaboration and networking among group members, resulting in co-authored outputs, e.g. the Human Palaeoecology Group landmark study of the impact of climate change on agricultural origins in the Aegean (Asouti et al. 2018) with substantial input in analysis design and multivariate methods by ECR Kabukcu).

PGRs and ECRs are encouraged to present their research, initially in Research Groups, as results emerge, as seminar presentations, e.g. Human Origins holds a dedicated staff research day, with feedback provided to all presenters. Colloquia and conferences arise from Groups, e.g. in the Literary Cultures Group the colloquium 'Middle Platonism and its Literary Reflections' (co-organised by ECR Cartlidge with Zadorozhny, 2020, University of Freiburg) and PGR-run colloquium 'The Uncanny in the Ancient World' (PGRs Sanderson, Clare and Poole, 2018,

supported by AHRC-funded Northwest Consortium Doctoral Training Partnership (NWCDTP) with the proceedings to be published in 2021).

Human Origins (Barham, Gowlett, Grove, Sinclair; 14 PGRs).

Themes of technology, mobility, social learning and symbol-use exemplify a distinctive Liverpool perspective on humanity's evolution as a gradual, cumulative process. Our approach is based on collaborative research (e.g. Barham and Gowlett's 'Deep Roots' project, Zambia, AHRC, £340k) and interdisciplinary research and impact projects in Africa and Arabia (e.g. Gowlett's Leverhulme-funded Kilombe project; Grove's NERC-funded Chew Bahir project with important palaeoenvironmental components). High-profile publications reflect a long-term perspective on humanity including the evolution of a sense of aesthetics (Gowlett 2020); demographic processes affecting social learning (Grove 2015); the origin of language (Barham with ethno-linguist Everett 2020). Impact is delivered in Kenya and Zambia in partnership with national and local museums and educational facilities in rural areas linked to national curricula on history and archaeology contributing to **SDGs 1, 3, 4, 17**. In Ghana, impact is delivered via the Global Challenges Research Fund (GCRF) supported 'International Slavery Knowledge Network' using community-led heritage-based interventions to raise awareness of the socioeconomic triggers of enslavement in the Global South, contributing to **SDG16**. This Group provided a supportive environment for Plomp's Marie Skłodowska-Curie Fellowship on evolution of the human back and attendant pathologies. Post-census date, this Group has been enhanced by the addition of French to its T&R staff enabled by Sinclair's Major Leverhulme Fellowship (2020) to expand his scientometric research on Archaeology as a discipline.

Human Palaeoecology (Asouti, Baird, Dobney, Hommel, Hulme-Beaman, Kabukcu, Pearson; 15 PGRs). This Group focuses on human-environment interactions, especially major developments in human relationships with plants and animals. This Group developed from Early Village Societies returned in REF2014, with appointments of Dobney, Hommel and Leverhulme ECFs Hulme-Beaman and Kabukcu. High levels of integration underwrite the Group's success, evident in grants, publications, and impact. Asouti, Baird, Kabukcu and Pearson all work closely on major field projects in Turkey with international collaborators. Boncuklu related funding was £607k in the census period, including Asouti (Leverhulme), Pearson (AHRC), Baird (with various funding sources alongside Australian Research Council for which Baird was formal Partner Investigator) and in Iraq (Eastern Fertile Crescent project, EFEC), seed-funded by Wenner-Gren (and various other sources) investigating agricultural origins and late Pleistocene adaptations in central Anatolia and the Zagros respectively. Pearson's (2018) research on biocultural factors affecting breastfeeding practices spans the Eurasian Holocene. This Group has produced a stream of publications in wide-reaching multi-disciplinary journals.

Unit-level environment template (REF5b)

Dobney (2017) and Hulme-Beaman's (2019) research is also strongly interdisciplinary, including Geometric Morphometrics and DNA approaches on animal management, domestication and commensalism generating important outputs alongside major interdisciplinary funded projects such as the **GCRF Horn project** with its impact through **SDG3 (Good Health and Well-Being)** and **SDG12 (Responsible Consumption and Production)**.

The Human Palaeoecology Group has effectively translated its research into impact (Section 4.4.), e.g. contribution of EFEC to development of the Sulaymaniyah Museum prehistory gallery, implications for contemporary livestock management in East Africa via the Horn project and the Boncuklu case study with impact on museums and education in Konya province, Turkey addressing **SDGs 1, 3, 4, 11, 17**.

Egyptology (Chauvet, Collier, Enmarch, Escolano-Poveda, Eyre; 40 PGRs).

Liverpool is one of a limited number of Egyptology research groups in the UK and one of the largest with an exceptional concentration of researchers specialising in the material culture, language, literary and social histories of ancient Egypt. These complementary interests fuel innovative research, typified by Chauvet's analysis of elite tomb construction (2015) and Eyre's 3-year Leverhulme funding aimed at creating an ethnography of ancient Egypt. Research by Collier (2016) and Enmarch (2020) on grammar and textual signs reveals significant subtleties in Egyptian writing. Major collaborative fieldwork projects include the Mut Temple Precinct excavation co-directed by Chauvet with Betsy Bryan (Johns Hopkins), investigating the urban development of Thebes in the New Kingdom. Inter-group collaborative research creates innovative interdisciplinary PGR projects, incorporating science-based archaeology (supervised by Ponting) and linguistics (supervised by Collier, Enmarch) funded by the NWCDTP. Research by Escolano-Poveda on Graeco-Roman Egyptian priesthood (2020) and Eyre on ancient Egyptian economy and society (2016, 2017) dovetails with major research projects on Achaemenid and Roman Egypt typified by Tuplin's Arsama project (2020) and Adams' research on Roman imperial administration and corruption (2017), both cross-cutting with the **Ancient Economies** Group.

Staff and PGR research regularly features in exhibitions and curatorial activity in relation to Egyptological museum holdings in NW England (e.g. AHRC Collaborative Doctoral Awards involving Southport [Atkinson], Bolton, Manchester, National Museums Liverpool [NML]). Formal University links with the NML have created new opportunities for public engagement involving staff, PDRAs and PGRs, raising public awareness of Egyptological research at Liverpool.

Households and Communities (Archibald, Baird, Chauvet, Fitzjohn, Foxhall, Mytum, Pearson, Pope, Routledge; 27 PGRs).

A focus on the interplay between households and communities in prehistory and the ancient world, through the study of material and textual sources, is enriched by cross-departmental cooperation. It also produces fruitful engagement with non-academic beneficiaries, exemplified by Foxhall's research on Greek rural settlements (2020) and Baird's research on central Anatolian Neolithic households and communities (2017). Pearson's collaboration with Baird on households, mobility, mortuary practice and community construction resulting in her (£145k) AHRC grant is reflected in the Boncuklu impact case study and underpinned a British Academy Newton Advanced Fellowship held jointly with Koç University/Istanbul (Haddow). Archibald's and Fitzjohn's research on Greek houses, including Archibald's major Pistiros and Olynthus field projects, generated significant research and related impact (see Fitzjohn's impact case study).

Research on Iron Age hillforts and the Celts by Pope (2020/1) contributes to better understandings of Iron Age cultures across Britain and Europe. Mytum's research on Iron Age houses and communities contributes directly to our engagement with partners such as Pembrokeshire Coast National Park through his experimental work at Castell Henllys and consequent expansion of heritage provision there (see Mytum's impact case study). Baird has also incorporated a programme of experimental house construction at Boncuklu enhancing Konya museums and local schools' capacity (see Baird et al., impact case study), contributing to **SDGs 4, 11, 17: Quality Education; Sustainable Cities and Communities; Partnerships for the Goals.**

Routledge's research on Iron Age Jordan (2016) successfully translates interrogation of the role of households in constructing and reproducing communities into impact with social and economic benefits. The Dhiban project (AHRC GCRF Newton Fund £220k and Leverhulme Trust) uses the site's architectural heritage to create positive identities in an area that recently experienced economically driven civil unrest. Transformation of the site into a tourist destination helps alleviate local poverty (**SDG1: No Poverty**). A school-based public history programme involving teachers includes capacity building with trainee researchers from Mutah University (**SDG4: Quality Education**). Both contribute to **SDG 11: Sustainable Cities and Communities.**

Ancient Economies (Adams, Archibald, Eyre, Freeman, Foxhall, Hirt, Hommel, Ponting, Tuplin, Widell; 29 PGRs) brings together a unique combination of perspectives across ancient economies including Ancient Egypt, Near East and the Classical world, combining texts and archaeology. Distinctive foci are Greek and Roman trade (Adams 2017; Archibald 2019), resource procurement and coinage (Ponting 2014, 2015; Hommel 2015), and Mediterranean and Near Eastern administration/management of economic activity (Hirt 2018; Widell 2020). The work of this Group across ACE underpins a distinctive Liverpool approach to ancient economies

Unit-level environment template (REF5b)

and their administration, continually attracting PGRs and ECFs (e.g. Van Regenmortel, Leverhulme ECF, working with Archibald and Foxhall post-REF2021 census date). This Group has been an ideal context for generating major grants and outputs (e.g. Ponting's AHRC [£300k], ERC [£880k] awards researching Roman silver coinage and 2014 monograph).

Literary Cultures of the Ancient World (Cartlidge, Enmarch, Escolano-Poveda, Gibson, Greaves, Hobden, Jones, Perale, Petridou, Tuplin, Zadorozhny; 4 PGRs) and **Receptions** (Freeman, Gibson, Hobden, Jones, Zadorozhny; 8 PGRs) represent two closely inter-related Groups with overlapping interests and staff.

Literary Cultures has seen growth in staff with Perale's post and Cartlidge's Leverhulme ECF. Close links with Enmarch and Escolano-Poveda (Egyptology) provided the ideal setting for Perale's completion of volume one of *Hexameters of Unknown or Uncertain Authorship* from Graeco-Roman Egypt (2020), with more to follow in the next period. The Group provided a supportive environment for research over a wide range of literary cultures, with Gibson's research on ancient praise in Polybius and Latin panegyric (2018, part of an ongoing collaboration with St Andrews) intersecting with strength in imperial Greek literature (e.g. Escolano-Poveda 2020, Petridou 2016, Zadorozhny 2018). This fertile context has led to a creative interdisciplinary collaboration with Politics at Liverpool in the **Network for the Interface between Classics and Politics** (NICP, Section 4.2), alongside a **Receptions** research stream related to deployment of rhetorical traditions in contemporary politics.

Highly distinctive approaches to **Receptions** typify Liverpool research in relation to audio-visual media, art and literature, exemplifying how our Research Groups provide stimulating environments for cross-disciplinary research. Receptions members populate the interface between Classics and other subject areas. Hobden's research on Classics in TV and film has led to close cooperation with media studies researchers (A. Wrigley, Reading) and film makers (D. Wilson, independent). She has supervised AHRC NWCDTP student (Clare) on research in the gaming industry. Zadorozhny's research on the influence of ancient heroism on Tolstoy (2018) contributed to a prestigious two-year fellowship at the multi-disciplinary Helsinki Collegium for Advanced Studies.

The Body (Hobden, Fitzjohn, Jones, Matczak, Nugent, Petridou, Pearson, 4 PGRs) represents a Research Cluster developed in the current REF cycle, typifying our active fostering of interdisciplinary synergies. The networking project '(De)Constructing the Body: Ancient and Modern Dynamics' (Petridou, 2019-20, Wellcome Trust, £23k) consolidates an agenda around cross-cultural practices regarding illness, ageing, death and burial. It builds upon initial collaborations formed during the 2018 School-funded (£2k) workshop 'Subversive Suffering:

Pain and Patient Identity in Ancient and Modern biographies' (also including members of the cross-Faculty Centre for the Humanities and Social Sciences of Health, Medicine and Technology), and through departmental research seminars (with participation of network Co-I Eidinow, Bristol). The Body combines expertise in Classics (Hobden, Jones, Petridou), Archaeology (Fitzjohn, Matczak, Nugent, Pearson, Plomp), Social Anthropology, Law, English, History of Medicine, Clinical Ethics, medical practitioners and patients. Contributors from Germany, Spain, UK and US extend the interdisciplinary and international reach of The Body and its future impact.

ECRs Matczak and Plomp joined the Group, both on Marie Skłodowska-Curie Fellowships. The Body provided an excellent context for Nugent's UKRI Future Leaders Fellowship (FLF) research on mortuary science, leading to a permanent appointment, underwriting the future sustainability of this Group (**SDG 3: Good Health and Well-Being**).

1.3 Open research

Green OA is encouraged across the board for all academic and research staff for dissemination of journal articles, conference proceedings and book chapters. Author-accepted versions are hosted in the Liverpool Elements institutional repository. We encourage staff, in Research Conversations, to seek Gold OA opportunities through external grants linked to specific projects or via the institutional Open Access Fund (£6k used by staff) supporting publications by staff and PGRs, e.g. EFEC project excavations at Palegawra cave, Iraqi Kurdistan, which includes all project datasets and a comprehensive archive of original images and digital maps (Asouti et al. 2020).

Staff are encouraged to deposit data with research recognised repositories (e.g. the Archaeology Data Service, York for Ponting's analytical results for 'The Metallurgy of Roman Silver Coinage'), and with Liverpool's research data repository (**DataCat**). Nugent's FLF 'Digital Library of British Mortuary Science' will create an open access library of texts, images, and records of human remains in formats for Natural Language Processing, Corpus Linguistics, and 3D visualisation (OA depositories: Church Heritage Record and Archaeological Data Service). Visualisation features in a new regional initiative led by the Garstang Museum to create digital archives of museum collections for collaborative research and knowledge exchange (Section 4.4.4).

1.4 Beyond REF2021

We have built upon and reconfigured existing strengths to meet our aims of being a global, interdisciplinary, socially engaged unit (Section 1.1). Our future strategy will sharpen that focus, addressing important long-term issues for humanity through continuing to:

- support existing Research Groups and consolidate newer groups
- develop existing and new partnerships and impact
- enhance and embed equality and diversity

Long-standing successful Research Groups such as Human Origins, Egyptology, Ancient Economies, Literary Cultures/Receptions have demonstrated their effectiveness in project development and delivery with major continuing projects, e.g. Eyre's Leverhulme Fellowship, Ponting's ERC project. Reconfigured Groups (Human Palaeoecology Households and Communities) and emergent group, The Body, are starting to realise the potential of new collaborations and will be key vehicles of broad-based interdisciplinary research over the next 5 years. Future sustainability of these Groups has been reinforced by 7 appointments during and after the current REF period (Section 1.2).

Digital-based approaches in humanities and science-based archaeology (Section 3.2) will continue developing as core strengths and will remain complemented by our growing expertise in digital and medical humanities. We are currently expanding our experimental and photogrammetry facilities and capacities, partly supported by developing skill-sets of our in-house technicians, with wide applicability across our research and impact areas (Section 4.4). Our digital humanities approach is being expanded through the 7 years of Nugent's UKRI FLF with ongoing recruitment of PDRAs and PGRs to The Body Research Group.

Partnerships across disciplines and outside academia are central to delivering our goals of addressing key issues for contemporary societies. The developing University Heritage theme offers increased interdisciplinary collaborative opportunities, and links to wider non-academic networks including projects that will run through the next REF cycle (Section 4.4), e.g. Routledge's work at Dhiban, Jordan; Baird's ongoing collaborations attested in the Boncuklu case study and his follow-up work with Yazidi communities on their heritage; Mytum's engagement with Castell Henllys' visitor centre team; Fitzjohn's work with schools; Gowlett and Barham's work with Kenya and Zambia museums; Dobney's Horn project in East Africa. Nugent's research on exhumation will benefit UK church organisations and related public societies over the next 7 years. These ongoing activities offer important vehicles for embedding impact approaches in our PGR and ECR projects.

An integrated ACE gives us a collective awareness of gender and BAME disparities in our staff profile and an effective strategy to address these inequalities over the short- and medium-term (Section 2.1.3).

2. People

2.1 Fostering an Open and Inclusive Department

ACE aims to retain and recruit the very best researchers to build on our international reputation for research and impact excellence. A nurturing research environment is essential for achieving that aim by enabling staff to fulfil their potential and deliver globally significant research and impact. Our environment recognises and fosters individual diversity and provides flexible structures to ensure inclusion. Within this environment, each colleague is:

- supported in setting and achieving goals
- encouraged to explore new ideas and collaborations.

2.1.1. *Setting and achieving goals*

Our two main support structures, **Professional Development Reviews (PDRs)** and **Research Conversations**, prioritise face-to-face interactions, in person or online, as the primary means of enabling staff to stay motivated and progress academically. PDRs are also a safe place for discussing and acting on institutional and departmental EDI policies (e.g. bullying) (Section 2.1.3). Research Conversations enable the unit to maintain its sustainability and adaptability to emergent research trends through supporting individual staff priorities over a three-year planning cycle.

Annual **PDRs** provide a key forum for identifying issues affecting staff well-being and career progression. Meetings are one-to-one, led by a senior staff member who facilitates reflection on, and agreement of practical outcomes. Anyone with significant managerial responsibilities (including leading funded research projects) may train as a PDR mentor, ensuring a plurality of experiences feed into the process. In addition to a PDR mentor each member of staff is assigned a research mentor to advise on research and impact development and provide feedback on grant applications.

Biannual **Research Conversations** provide similar opportunities for staff to discuss their research and impact plans over a rolling 3-year horizon. They take place in a supportive,

informal context involving relevant members of our Research Committee with expertise in grant generation, project management, impact development, open research initiatives and knowledge of training and funding sources at institutional, national and international level (e.g. ECR Escolano-Poveda: committee feedback contributed to a successful Humboldt Research Fellowship in 2019). Ongoing and future research activities are reviewed, and potential impact identified and supported through leave arrangements, as with Fitzjohn (below). Emerging synergies with other staff interests are identified in this format.

Providing staff time for research and impact development is critical to generating high quality outputs, which are in turn rewarded by promotion and peer esteem. All staff have a research leave entitlement of every 6th semester (each academic year at Liverpool has 2 semesters). ACE also offers extended leave of up to 12 months to support large-scale research and impact (e.g. Fitzjohn 'Grand Designs in Ancient Greece'). Faculty **funding for impact data-gathering** further eases time pressures on staff (e.g. travel and PDRA support for Baird, Fitzjohn and Mytum). One day per week during term time (Research Day) is allocated to all staff for research/impact activities and blocked from teaching and administrative duties. Sabbatical leave has often been enhanced by linking the leave cycle to external-funded leave (e.g. both Eyre and Sinclair's Leverhulme Major Research Fellowships (2018; 2020) are linked to institutional leave, extending the project preparation phases and enabling appointments of Escolano-Poveda and French).

2.1.2 Encouraging new ideas and collaborations

Financial support is instrumental for pump-priming new research and impact projects. The School offers researchers an annual allowance of £600 to facilitate research trips, conference attendance and publication preparation. Grove's participation in the international Chew Bahir research project arose from participation in a 2017 Society of American Archaeology meeting on climate change, resulting in two publications (Grove 2018, Grove et al. 2018) and a NERC-funded PDRA (Blinkhorn). School funding (up to £3k) for pilot studies underpinning grant applications enabled Asouti and Baird's EFEC project (2014-2017) to secure several grants (Wenner-Gren, BISI, Wainwright Fund) that facilitated the completion of its pilot phase with publication of her Palegawra excavations in Iraqi Kurdistan (Asouti et al. 2020). Barham's initial Ghana fieldwork, afforded by £1.5k from the School, led to a BA grant (£10k) and importantly to University of Ghana contacts essential to the success of a major cross-institutional AHRC GCRF-funded 'Anti-slavery knowledge network' (£1.7m).

Constructive feedback on grant applications is offered informally and via the grant approval process requiring ACE Research Committee feedback on larger applications (>£20k). Departmental advice was instrumental in Pearson's successful projects (BA/Newton £73k;

AHRC £90k), contributing to her promotion to Reader. Faculty grant-writing workshops and peer review processes, linked to specific funding calls, led to 8 successful applications including 2 GCRF awards (Barham, Routledge), and 5 Leverhulme ECFs (Cartlidge, Hulme-Beaman, Kabukcu, Van Regenmortel and Parkhouse starting 2021).

2.1.3 Embedding equality, diversity and inclusivity (EDI)

Enhancing staff diversity is central to our recruitment strategy, building on existing research strengths and capacities whilst responding flexibly to changing subject-led priorities. Post REF2014, contributions by ACE staff (Asouti, Foxhall, Kabukcu, Pope) led to the development of EDI School policy and a successful School **Athena SWAN** application (Bronze Award, 2018). Our co-Chair of the Faculty Athena Swan Team, (Godenho, T&S), laid the groundwork for a **new departmental EDI Committee** (2019). This Committee's role is to initiate change at the local level, reflecting the range of protected characteristics in the Equality Act 2010, and to implement wider institutional policy (see REF5a, 3.1). Comprising UG, PGT, PGR, ECR and academic staff representatives, plus members from other committees, the Committee identified gender disparity in our staff profile (68/32% M/F), especially at professorial/reader level (79/21% M/F) which falls below the subject average. As of 2018, ACE is **above national average in its proportion of staff identifying as LGBTQ+ and disabled** (3% per category; nationally 2.2% LGBTQ+ and 2.1% disabled: Office for National Statistics 2019) and on par with the subject-wide lack of ethnic diversity (0.7%, Landward 2014). We aim to limit use of fixed-term contracts (FTC) to cases where staff have been awarded fellowships requiring teaching replacement. FTC-staff participate in Research Groups adding to the vitality of the environment and receive career-enhancing support through PDRs and Research Conversations.

Our EDI committee developed and implemented and implemented an ACE-specific policy on recognising and reporting harassment in fieldwork and across the breadth of our activities. This links directly to institutional policies on harassment and bullying (see REF5a, 3.2) and apply to staff and students.

To redress imbalances in gender and diversity we have enacted a four-part plan with immediate effect alongside a longer-term recruitment strategy:

- (i) fixed-term senior departmental administrative roles are open to all promoted staff to increase role turnover and opportunities for career development
- (ii) appointment of female PDR mentors; refresher EDI training for all PDR mentors to create a positive promotion culture
- (iii) initiation of a recruitment policy of 'positive action' (below)

(iv) developing a more flexible work environment (below).

All research staff involved as PDR reviewers, REF2021 output/impact assessors and on recruitment panels undergo EDI training (Advance HE).

Initial results include appointment of three new female PDR reviewers for a total of four (Asouti, Hobden, Nugent, Foxhall) and rotation of the Chair of the Research Committee (Asouti).

Beyond ACE, Foxhall holds senior roles as School Dean and University Lead of the Institutional Heritage theme.

A **proactive recruitment policy** of 'positive action' (Equality Act 2010) addresses gender and BAME imbalances on a case-by-case basis where two candidates are equally qualified, but one has an under-represented protected characteristic. The policy will apply to planned hires over the medium-to-long term with staff retirements.

2.1.4 Enabling and encouraging inclusivity

Flexible hours, tailored teaching timetables and remote working enable staff with care-giving commitments to organise their working day, e.g. confining teaching commitments within school days allowing for childcare. A shift towards online research seminars was underway pre-COVID-19 with Research Group activities scheduled for lunchtimes to maximise access. Family-friendly scheduling of activities to 10am-4pm extends to the Flagship Seminar series (uniting all our research areas around a common theme/topic), Staff Away Days, all meetings and recruitment events allowing staff and PGRs to plan around caring responsibilities. All on-campus events (pre-COVID) take place in recently upgraded refurbished wheelchair-accessible rooms with hearing-loops and video conferencing facilities to enable remote participation following upgrades of access and AVI facilities by the University.

We encourage staff to take active roles in raising awareness of EDI issues through academic research and public engagement. Our research brings a distinctive **deep-time perspective to LGBTQ+ History** through OUTing the Past Festival ("Same sex desire in Ancient Egypt", Enmarch, 2017; Egyptology). The ACE Flagship Seminar interrogated the colonialist history of archaeology with Liverpool historian Effros ('Colonial encounters in Roman Lambaesis (Algeria) in the nineteenth century', 2019). Our staff contribute to University EDI initiatives (e.g. Greaves' involvement in the University's LGBTQ+ network and in online EDI training for all staff).

2.2 Training and Supporting the Next Generation

We take seriously our responsibilities for training the next generation of researchers and for raising their awareness of the wider societal value of their work. Since REF2014, our PGR completions have increased from 52.5 combined for Classics and Archaeology to 77.13 by the census date (45% increase). PGRs play a central role, contributing to and maintaining the vitality of our research environment through their projects, active participation in Research Groups and manifold contributions to impact (e.g. as part of the Liverpool Schools Classics Project, PGR Coe deployed his research on evolutionary anatomy to teach the subject to pupils from under-represented state-school backgrounds through the 'Brilliant Club' charity).

Since REF2014 we have actively sought and increased enrolment of funded PGRs (in full or part). ACE secured 21 PhD studentships via the AHRC NWCDTP through the Heritage (formerly Archaeology), Classics and Linguistics pathways. That success reflects the work of our PGR academic admissions team (Asouti, Hirt, Hobden, Grove, Collier) who developed an integrated application process involving peer review and close mentoring of prospective applicants to convert their research ideas into compelling funding applications.

ACE actively welcomes UK and international PGRs through other (non-UKRI) sources of competitive funding including ACE's Elizabeth Slater Fund which has supported 5 PGR Graduate Teaching Fellows since 2016 (3 Archaeology, 1 Classics, 1 Egyptology). As of 2020, a School-wide scholarship scheme is in place to support PhD applicants in addition to existing competitive University studentships (Duncan Norman, Joseph Rotblat, John Lennon schemes, recruiting 13 PGRs over the census period). Our reputation for research excellence also attracts overseas students with home-nation funding (Egypt, Turkey, China, Saudi Arabia, Brazil).

2.2.1 Integrated Training Support for PGRs and ECRs

Departmental mechanisms for supporting PGR development link directly to the Liverpool Doctoral College (LDC) which provides a framework for monitoring progression and delivering central skills-training identified via an annual Development Needs Analysis (see REF 5a, 3.5). Monthly supervisory meetings underpin this institutional framework and provide a context for identifying more immediate training needs.

Research Groups offer a collegial setting for PGRs to develop research presentation skills and receive feedback as part of subject-based seminar series. PGRs furthermore shape the content of departmental seminar series by proposing themes and inviting speakers, e.g. in Human Origins, 2 PGRs share organisational responsibilities for a seminar series in each academic

year, gaining practical experience in research event organisation. As part of the departmental response to COVID-19, the organisers moved the Human Origins research seminar series online, thus attracting wider international interest. PGRs also organise weekly “Work in Progress” seminars, run in parallel to events hosted by ACE’s Research Groups. These are cross-disciplinary in scope, with PGRs presenting their research to a non-specialist audience.

Our PGRs have organised 7 international research events involving PGR networks outside Liverpool, Liverpool staff and speakers from elsewhere including the above workshop and “Unravelling the Palaeolithic” (2017), “Exploring Textiles and Textile Working from Prehistory to AD 500” (2018), the Annual Meeting of the British Association for Near Eastern Archaeology (2019) and the Annual Meeting of Postgraduates in Ancient Literature (2017), plus 2 conferences on the theme of “Networking in the Ancient World” (Tracing Trade and Social Networks” 2016; “Tracing, Understanding and Interpreting Trade and Social Connections” 2018). The experience gained from organising these events contributes to PGR professional development and the building of research networks.

Additional training is provided by externally funded events led by PGR demand. PGRs (Timbrell, Scott) organised a NWCDTP-funded training session on “Geometric Morphometrics for Archaeologists” (2020), while ECF Kabukcu (with contributions by Hulme-Beaman) led a **quantitative skills** workshop supported by the Faculty for ACE PGRs (2018). ACE expertise in Reflectance Transformation Imaging (RTI) featured in an engage@liverpool training event “Cross-disciplinary Applications of RTI” (2018) delivered by Greaves (Liverpool) and Duffy (York). Further bespoke training in digital visualisation techniques (photography, photogrammetry, RTI) is delivered in ACE by the **Photogrammetry Team** led by ECF Hulme-Beaman. The University’s Garstang Museum, located within ACE, with its extensive digital archives (Section 3.2) featured in methods-training session “Transformative Research Legacy Series” 2015 as part of the engage@liverpool programme (see REF5a; 3.5). Our PGR student impact featured at the AHRC NWCDTP conference (2018), “Human Technologies, Digital Humanities”.

2.2.2 Career mentoring and destinations

Our strategy to develop and retain the talent we attract begins with supporting PGRs in generating publications from their research for securing post-doctoral funding (e.g. Leverhulme ECF, British Academy Postdoctoral Fellowships, UKRI FLF). ACE’s Research Committee provides detailed feedback on post-doctoral research and publication plans and gives advice on impact arising from research.

For PGRs, the LDC provides training to equip students with relevant skills and experience for careers outside academe. PGR supervisors are a key part of the process, ensuring training needs identified by students are met, and giving practical advice on job opportunities locally in the institution and with heritage-based institutions, e.g. Nolan-Webster, employability officer in the Faculty of Science and Engineering, Liverpool (2016), and Brown, forensic officer with Merseyside Police (2018). Longstanding links with the museums sector as a destination for graduate employment (with Liverpool PGRs taking prestigious curatorships at the Liverpool National Museum (Cooke 2004 PhD), International Slavery Museum (Benjamin 2006) and Manchester Museum (Price 2011) continued with the appointment of Potter (2016) to Assistant Curator at National Museums Scotland.

Our international reach in research is mirrored in the geographical range of PGR fieldwork and its influence on academic career development. Ongoing research in Turkey on the origins of agriculture generates PDRA and ECR posts, e.g. Bami (2014, Marie Curie/2018, Mainz); Bennison-Chapman (2015, PDRA at Netherlands Institute for the Near East/Leiden); and Kabukcu (2015, Leverhulme ECF/2017, Liverpool) who contributes to Faculty ECF workshops. PDRAs take part in annual PDRs to identify support needed for progression and are encouraged to apply for grants that can be tied to permanent posts. Co-authorship of papers is encouraged to enhance PDRA/ECR career prospects (e.g. ECR Hulme-Beaman with Dobney [Hulme-Beaman et al. 2020, "GeoOrigins" paper]). Departmental and School support is complemented by additional Faculty grant-writing workshops and peer review to enhance applications. ECRs take part in biannual Research Conversations as well as PDRs to develop longer-term research and impact plans with funding.

During 2020 our support for PDRAs has been strengthened by the University's 'Prosper' initiative (see REF 5a; 3.3.2), providing in-depth training and support focused on career development, including major partnerships with business and industry. The scheme, the first of its kind, was set up with a £3.6 million grant from Research England. Archaeology has been active in Prosper's early stages, with important contributions from ECR Nugent.

Support of ECF/ECR staff through PDRs, Research Conversations, output co-authorship, School funding for conference attendance and pilot research projects all contribute to building portfolios of activity critical to securing academic positions. ECR Cartlidge secured a position at Oxford (2020); Hadow obtained a Marie Skłodowska-Curie Research Fellowship at the University of Copenhagen. Nielson (2016) and Twiston-Davies (2018) are lecturers in Egyptology (Manchester) and 3 PhDs from the previous census period have secured lectureships since 2014 (Baysal and Twigger, Ankara University; Miller, University of Nottingham).

3. Income, infrastructure and facilities

3.1 Income

Capitalising on our unification, we have significantly enhanced our research income by 108% from £1.58m in REF2014 to £3.29m in REF2020. Our annual income increased by 232% between 2013-14 (£238,613) and 2019-20 (£793,941). As a result, we have maintained income per-eligible-FTE position from 2014, following the merger and expansion in FTEs. The upward trajectory in grant spend provides a strong foundation for our financial sustainability beyond REF2021. We have established a success rate of 64% on PI-led applications for a total award value of £5.3m (total funder contribution) over the period.

Our research environment attracted 8 prestigious ECR awards (5 Leverhulme ECFs, 2 Marie Skłodowska-Curie Fellowships, and 1 UKRI FLF). This success reflects our strategy for attracting candidates and nurturing their development through tailored support in the Department, School and Faculty (Sections 2.1.2, 2.1.3). These awards not only increase income, but also expand our expertise base for sustained growth.

3.1.1. *Income generation: support mechanisms*

The substantial increase in income results directly from a key policy decision made post-REF2014 by the newly reformed Research Committee to actively support staff in applying for large grants (£100k-£1m) and enhanced peer review processes. Staff with interdisciplinary research networks were encouraged to consider large-scale projects addressing significant global challenges that justified substantial funding. The strategy resulted in a 14.5% increase in applications (REF2014=138, REF2021=158) and a 108% increase in research income (above). Research Conversations and Research Group feedback have been the vehicle for realising this goal through detailed discussion of project proposals, funding sources, and impact plans.

3.1.2 *Research Conversations as income generators*

A direct result of Research Conversations has been success in obtaining 17 large awards (>£90k) (total grant value=£4.36m) from a diverse range of sources: AHRC, Leverhulme Trust, British Council, European Commission including Marie Skłodowska-Curie, and Newton Fund.

Highlights by Research Group include:

- **Human Origins:** Barham and Gowlett AHRC 'Deep Roots Project' (£340k of £890k total); Gowlett Leverhulme 'Kilombe Caldera project' (£285k of £625k total); and Sinclair, Leverhulme 'Atlas of archaeology, scientometric analysis of discipline growth' (£158k)

- **Human Palaeoecology:** 2 Marie Skłodowska-Curie Individual Fellowships; Matczak (£231k), Plomp (£244k)
- **Egyptology:** Eyre Leverhulme 'An ethnography of Pharonic Egypt' (£130k)
- **Households and Communities:** Routledge (PI) and Bandyopadhyay (Architecture), AHRC-Newton Cultural Heritage and Sustainable Development in Jordan (£220k); Baird British Council Cultural Protection Fund 'Protecting and recording Yazidi heritage' (£96k)
- **Ancient Economies:** Ponting AHRC Standard Grant 'Roman coinage' (£360k) and ERC Advanced Grant 'Roman coinage' (£880k of £2m total)
- **The Body:** Nugent UKRI FLF, 'Digital library of British Mortuary Science' (£1.1m)

Our involvement in two successful major GCRF grants (Barham, Dobney) reflects a concerted effort at Department, School, Faculty and University level:

- (1) The 'Anti-slavery Knowledge Network' (total £1.7m, Barham's involvement £92k) built on previous archaeological research in Ghana (Barham, British Academy £9.8k), kick-started by School funds supporting initiation of contacts with University of Ghana, a key regional link in the GCRF network (**SDG16: Peace, Justice, Strong Society**). Local school workshops, operating under the University's Heritage theme brought Archaeology (Barham) together with Politics (Balch). The Faculty Research Team and University Research Support Office contributed feedback and legal and ethics guidance. Colleagues from the Universities of Hull and Nottingham complete the UK part of the network.
- (2) Dobney's involvement (£184k) in the £7.7m 'One Health – Horn of Africa' project brings our expertise in science-based archaeology (dental biomes) to bear on **SDG3: Good Health and Well-Being**.

Headline large grants are matched by our success in obtaining smaller awards (<£25k, n=69, total £598k), critical for supporting:

- field research in the UK (Mytum, Isle of Man, Manx National Heritage; Pope, Eddisbury Hillfort, Cheshire, English Heritage) and our archives (National Clay Pipe Register, Historic England)
- diverse research and impact field projects at various stages of development in Greece, Iraq, Jordan, Kenya, and Turkey (supported by Wenner-Gren and British Academy-sponsored institutes abroad including BIAA, BISI, BSA and BSR).
- Research in Egypt (Egyptian Exploration Society)

Small awards have also led to larger award successes, e.g. a £4.8k Society of Antiquaries bursary supported collaborative research at Olynthos by Archibald and Fitzjohn paving the way for Fitzjohn's AHRC Impact award (£78k, 'Grand Designs in Ancient Greece', Section 4).

A further 18 medium-size (£25k-£90k) competitive grants were secured from a diverse range of funders (NERC, Leverhulme, Loeb Foundation, Mercator Fellowship, Past Foundation, British Council, Helsinki Collegium Fellowship).

3.2 Investment in infrastructure and facilities

University investment in the physical unification of ACE in Abercromby Square (2015) and development of the Archaeology laboratories fostered a sense of inclusion, vitality and shared purpose in a research environment where all staff have equal access to appropriate facilities and infrastructure. The establishment of the **Elizabeth Slater Archaeological Research Laboratories** in 8-14 Abercromby Square, including state-of-the-art facilities and equipment, represents **strategic investment by the University in the future of archaeological science at Liverpool** (see REF5a; 4.2). Expenditure of £2m helped establish **6 archaeological science laboratories** (Archaeobotany, Atomic Spectroscopy, Lithics, Palaeodiet, Sample Preparation, Archaeological Projects Laboratory). Additional analytical facilities include: Scanning Electron Microscope suite, weighing room, Ancient Technology Workshop, GIS suite, Imaging Suite, environmentally controlled archive and bone store, plus 11 storage rooms. A dedicated Research Microscopy suite was enhanced in 2020 with an £80k Keyence VX7100 4K ultra-high accuracy digital microscope supporting staff and student research in archaeobotany, archaeomaterials, zooarchaeology and ancient textiles analysis.

ACE also houses the **Garstang Museum of Archaeology**, with important collections and archives from historical Liverpool field projects in Egypt, Sudan, and the Near East. Garstang's personal records and photographic collections curated in the archives form a body of material for staff research across ACE (Freeman, Greaves, Foxhall) and informing public events (e.g. the 2018 Meroë Head of Augustus symposium, University of Liverpool Victoria Museum & Gallery) (Section 4.4.4). Garstang Museum collections also provide key data for PGR projects relating to ancient Mediterranean technologies and materials used for designing innovative approaches to imaging research (PGR/Staff Imaging Group). Augmented-reality 3D models of Predynastic artefacts from the Garstang collection featured in the 2019 public exhibition 'Before Egypt: Art, Culture and Power' (Victoria Gallery, Liverpool).

Ongoing investment in equipment includes acquisition of 9 drones for use in archaeological survey and excavation and a structured light-scanner for 3D-printing of artefacts used by primary school teachers for delivering Key Stage 2 History as part of the 'Deep Roots' pathway to impact. In addition, 2 servers provide dedicated data storage maintained by the School's Senior IT Technician. ACE employs 2 senior technicians, with complementary expertise in experimental

archaeology and archaeomaterials, who oversee the running of the laboratories and contribute to practical training for staff, PDRAs, PGRs, PGTs and UGs.

PGT use of these facilities in dissertation research fed into 4 NWCDTP awards (2 in Human Origins, 2 in Human Palaeoecology-archaeobotany, zooarchaeology), and a Leverhulme-funded PGR (Human Origins-Kilombe Project). Our laboratories underpinned 2 successful Leverhulme ECF projects (Hulme-Beaman, 3D visualisation; Kabukcu, archaeobotany). Our capacity to undertake archaeometallurgical analyses supports research projects on Roman coinage (2014-18, AHRC, Ponting; 2019-2024, ERC, Ponting Co-I) and collaborations with museums nationally and internationally (e.g. Yale University Museum). Our dietary isotope facility supports PGR research and projects such as Pearson's AHRC-funded research on Neolithic palaeodiets in Eurasia (2015-2018).

The Ancient Technology Workshop enables staff and PGR **experimental research on stone, bone and wood technologies** highlighted in 2 NWCDTP-funded PGR projects, and in the AHRC-funded 'Deep Roots of Humanity' project. Our capacity for experimental research on pyrotechnologies (pottery, metallurgy, geochemistry of hearths) is further enhanced by a dedicated facility at Liverpool's Ness Botanical Gardens with technical support.

The Archaeobotany Laboratory is **unique in the UK** for its expertise and microscopy facilities on **archaeological charcoal science** (anthracology) alongside its comprehensive **Mediterranean and Near Eastern plant reference collection**. These facilities make Liverpool an international centre of excellence in Mediterranean and Near Eastern palaeoecology and support Asouti's research in the region, alongside hosting 4 NWCDTP-funded PGR projects. Additional strengths on seed archaeobotany and plant domestication are contributed by Leverhulme ECF Kabukcu, including high-profile projects in southeast Turkey (Göbekli Tepe & Karahan Tepe, co-directed by Necmi Karul of Istanbul University and Kabukcu) and in Iraqi Kurdistan (Shanidar).

Our lab facilities generate research income from **consultancy work for the heritage sector** (e.g. metallurgical analyses for Museum of London Archaeology, Museum of Liverpool, and analyses of seed and charcoal remains for Foxhall's Bova Marina project and the Mesolithic/Neolithic site of Llanfaethlu (CR Archaeology, Anglesey).

Reciprocal arrangements across the University allow use of our facilities in exchange for use of facilities in other departments (Chemistry, Engineering, School of Environmental Sciences, Life Sciences, Earth, Ocean and Ecological Sciences). This includes the use by Kabukcu of the SoES LIFER geochemistry facilities for her carbon isotope analyses of archaeobotanical remains from Turkey and Iraq, as part of her Leverhulme ECF. New arrangements made via the

Liverpool Technical Network enabled 4 PGRs and 1 PDRA (Hoare, Kilombe Project) to undertake analyses for their research projects at no extra cost, leading to Hoare's successful British Academy award (£30k).

4. Collaboration and contribution to the research base, economy and society

4.1 Global reach through collaborations

Our strategic vision (Section 1.1) is to produce research which engages with evolutionary and historical processes that shaped our world and continue to resonate in contemporary global issues and thus with institutions and communities enmeshed in those processes. This ambitious vision reflects the broad intellectual base of ACE with its embedded interdisciplinary approach to generating accessible (open) research and impact (Sections 1.2, 1.3, 4.4).

Research Groups enable us to develop collaborations institutionally, nationally and internationally, with academic and non-academic partners. School funding for such initiatives (up to £1.5k) and institutional support for networking across Faculties on the themes of Heritage, Digital Humanities, Medical Humanities and Slavery/Unfree Labour have led to new interdisciplinary projects (Section 3.1.2).

New international partnerships in China are generating staff and PGR research. Funding from the School and Peking University resulted in a co-authored publication on agricultural origins in Anatolia (Baird et al. 2018) and broadened the international reach of the **Human Palaeoecology** group. In 2019, a MoU was signed with the Institute for the History of Ancient Civilizations (IHAC), Northeast Normal University for mutual development of research projects with our **Ancient Economies** Group and established a joint PhD programme along with exchange of staff. Two PhD students are now in Liverpool to study Assyriology (Widell supervising) and a third started an Egyptology PhD in 2020 (Enmarch supervising). This partnership enhances the vitality of our research environment, with students and staff bringing new perspectives to established research strengths and contributing to our international reputation.

Individual initiatives supported by the Research Committee have led to the cementing of existing research and impact links with the National Museums of Kenya via a British Academy Links Mobility award (Gowlett). This supported exchange of staff between Liverpool and Nairobi, leading to refurbishment of Kariandusi Museum to accommodate local school groups, and to funding (Leverhulme) of a Kenyan PGR (Komboh) based in Liverpool who participates in the **Human Origins** Group. Research capacity-building in Kenya forms part of our strategy for extending the impact of our research internationally and decolonising the research base.

The NWCDTC provides a framework for generating collaborative interdisciplinary PGR research networks, e.g. Barham (Archaeology, Liverpool), Penkman (York, Chemistry) and White (Malacology, Natural History Museum) co-supervise a York chemistry student in developing a new dating technique for the Quaternary Sciences; and Petridou (Ancient History, Liverpool) and Crossley (Sociology, Manchester) provide bespoke training and co-supervision of a PGR student working on Mithraic religion.

4.2 Research Groups and collaboration

The broad temporal and geographical reach of our research operates at different levels of interdisciplinarity, from local networks to large international teams. We recognise and encourage this diversity of scale in relation to subject themes and appropriate research strategies. The Network for the Interface between Classics and Politics (NICP) (Literary Cultures) and 'Anti-slavery Knowledge Network' (Human Origins) both developed through cross-departmental collaboration initially with Politics. The latter project expanded nationally and internationally through its successful GCRF bid.

Through our Research Groups we have collaborative projects in 29 countries (Eurasia to Australasia=22 countries; Africa=5 countries; USA and Canada). Two case studies illustrate their diversity of international and interdisciplinary activity:

- **Human Palaeoecology** works with host governmental institutions in Iraq, Turkey, Kenya, and Ethiopia with the Boncuklu (Baird) and EFEC (Asouti) projects involving international networks of researchers from 10 universities in the UK and abroad (Exeter, Reading, Bournemouth, UCL, Bulent Ecevit, Harvard, METU Ankara, Max Planck, Peking, Queensland) offering complementary expertise in plant microfossils, zooarchaeology, anthracology, geoarchaeology (micromorphology), phytoliths, micromammals, ground stone tool technologies and dietary isotopes. These networks build on interdisciplinary interactions within Liverpool's Department of Geography through the 'Unfamiliar Landscapes' project, linking directly to a key research aim of the group to investigate the origins of the transition to agriculture.
- **Ancient Economies** has a Mediterranean/Middle Eastern base with active research featuring in ERC-funded 'Rome and the Coinages of the Mediterranean, 200 BCE – 64 CE' with UK partners (Warwick; Rutherford Appleton Laboratory) and an advisory panel drawn from universities and museums in Austria, Belgium and France. The Olynthos project (Archibald Co-Director) involves collaborative research with the University of Michigan and the Greek Archaeological Service (2014-2019). Staff contribute to other European-based projects: 'Patrimonium: Geography and Economy of Imperial Properties in the Roman World (Bordeaux: Adams, Hirt), 'Production Economy in Roman Greater

Syria; Trade and Networks' (Aarhus: Adams, Hirt), and the AHRC-funded UK-based (Warwick) 'Debasement: Manipulation of Coin Standards in Pre-Modern Monetary Systems'. Widell collaborates with researchers at the Oriental Institute, Chicago and Hood Museum of Art, Dartmouth, on the textual analysis of Sumerian administrative tablets.

4.3 Academic citizenship

We take pride in the involvement of our staff in supporting the discipline nationally and internationally:

- journal editors or members of editorial boards (n=19),
- conference organisers (n=16)
- members of peer review bodies (n=23, e.g. AHRC peer review college, NWDCTP pathway leads, European Research Council, National Science Foundation, Italian Research Quality Evaluation, Polish National Science Centre)
- external assessors for promotion to professorships (n=13)
- external PhD examiners (n=54).

Staff have presented, on average, 9.3 papers each at conferences over the REF cycle. The quality of individual researchers has been recognised with the award of a British Academy Fellowship (Gowlett, 2017) and National Science Foundation Cozzavelli Prize (Pearson 2020). We encourage all staff and PGRs to engage in public activities including outreach to raise the wider profile of the discipline.

4.4 Investing in social capital and capacity development

Working with local, national and international beneficiaries, as noted in section 1.1, our research contributions address global challenges and SDGs. Within this broader framework, our strategy targets:

- 1) museums and heritage sites
- 2) enriching educational provision in schools
- 3) preserving heritage under threat
- 4) informing a global public

Collectively these contribute to SDGs 1, 3, 4, 5, 11, 12, 16 and 17: **No Poverty; Health and Well Being; Quality Education; Gender Equality; Sustainable Cities and Communities; Responsible Consumption and Production; Peace, Justice and Strong Institutions; and Partnerships.**

4.4.1 Enhancement of UK and international museums and heritage sites

Our Castell Henllys and Boncuklu impact case studies represent individual components of a broader UK and international network of engagement with museums and heritage management partners. Additional examples are:

- Routledge's Dhiban project, Jordan: GCRF funding secured Ministry of Tourism approval and government funding for construction of a site visitor centre, incorporating archaeological results and public history work generated by the project. Local people were trained in heritage conservation (**SDGs 3, 11, 17**).
- Gowlett's partnership with National Museums of Kenya resulted in the re-development of the Kariandusi Museum. This initiative arose in response to continued local interest in the project by schools and community leaders. Re-development is ongoing with a classroom and displays being constructed incorporating project results (**SDGs 3, 11, 17**).
- A new (2020) Art Fund sponsored project hosted by the Garstang Museum offers regional museums (Liverpool, Manchester, Southport, Bolton, Carlisle) the benefits of our expertise in 3D visual imaging to create digital archives for research and public engagement in the interest of open, collaborative research and knowledge exchange (Section 1.3). This builds on regular input by our staff into previous exhibitions and collections management of these museums.
- We regularly enhance curatorial knowledge and skills amongst our partners. The Boncuklu impact case study illustrates this, alongside British Council Cultural Protection Fund support for Greaves' 'Carved in Stone' RTI training of Turkey's museum staff for recording reliefs and inscriptions; Ponting and his PGRs analytical work on coins from the Museum of London (MOLAS) and Huxley Hoard (Museum of London); and Foxhall's PGRs work on Egyptian textiles held by museums in NW England. (**SDGs 3, 4, 11, 17**).
- As an extension of this we contribute to exhibition development as indicated by the Boncuklu impact case study, and Asouti and Baird's contributions to the new Sulaymaniyah Museum prehistory gallery featuring their EFEC research. They advised on visuals and text as well as suggesting artefact content (**SDGs 3, 4, 11, 17**). Egyptology staff contributed academic content to Tate Liverpool's exhibition 'Surrealism in Egypt' (2018) with PGR-led public tours. The Tate exhibition linked directly, via an Exchange Residency with the Garstang exhibition on the 'Book of the Dead,' showing the close connection between our research and Liverpool's cultural life.

4.4.2 Enriching educational provision in schools

Our Grand Designs in Ancient Greece and Boncuklu impact case studies exemplify engagement with schools to contribute curriculum delivery in new, stimulating ways. These approaches inform other examples:

- Teaching and support training for teachers, e.g. 3-day courses on Ancient Greece, Rome and Egypt, and internal Postgate fund supported CPD activities for GCSE and A-level teachers of Ancient History in Liverpool, London and Cambridge replete with material from our research projects.
- Routledge's GCRF-funded Dhiban project has worked with schools in the town, by the site, with a public history project relating to the tell in which the children were involved, 'Valuing sites through valuable stories' (SDGs 1, 3, 4, 11, 17).
- Greaves' British Council-funded Carved in Stone project developed and disseminated a series of educational resources incorporating his research, including games that taught children about heritage with conservation heritage education training for 200 teachers and community volunteers who then engaged with an estimated 3,000 schoolchildren within the project's first year. The games are available to download, freely minimising costs for schools (SDGs 1, 3, 4, 5, 11, 17).

4.4.3 Preserving heritage under threat

- Baird's British Council-funded Cultural Protection Fund Yazidi project grew from research into Yazidi shrines. Yazidis are a minority located largely in Iraq subject to genocide by Daesh including destruction of their shrines and heritage. The project has recorded Yazidi shrines and memories of destroyed shrines, incorporated into 8 documentaries, preventing heritage losses and helping displaced Yazidis retain a sense of cultural identity. The research has also embedded discourse in the Yazidi leadership as the best approach to rebuilding shrines and ensured the reinstatement of Qewwal (travelling priests), retaining ritual practices and identity. In addition, 9 displaced young adult Yazidis from refugee camps have been trained to make heritage documentaries, preserving heritage and providing skills important to their further development, contributing to **SDGs 4 and 5**. This work has raised awareness of Yazidi heritage in neighbouring communities, promoting a tolerant north Iraq. The documentaries were broadcast to 43,000 viewers on Kurdish TV plus screenings. Feedback indicated that 60% felt that the documentaries had contributed to preserving Yazidi heritage, and 89% had gained a better understanding of Yazidi heritage. Moreover, the research has raised awareness of the destroyed shrines amongst local and national policymakers

contributing to protection of Yazidis and their heritage. This work has contributed to **SDGs 1, 3, 4, 5, 11, 12, 17**.

- Greaves' Carved in Stone project trained 51 representatives from museums, research institutes and commercial heritage consultancies in RTI recording of reliefs and inscriptions to reduce the risk of damage to monuments, contributing to **SDGs 1, 3, 4, 5, 11, 17**.

4.4.4 Informing media, local and global publics

A wider aim of our partnership strategy is to engage in public discourse on how the past links to contemporary global challenges. This is well represented in our 4 submitted impact case studies. Staff actively contribute to building wider societal understanding of the evolutionary and historical foundations of humanity. These foundations include:

- dependence on technology (Boncuklu Visitor Centre exhibition on origin of farming)
- cultural generation of norms, values, and identities (NICP; Gay History Week; minority language visibility in Calabria (Foxhall))
- de-colonising Archaeology (Freeman, Head of Augustus exhibition 2018)
- spread of infectious disease (Horn of Africa Project, The Body Research Group)
- adapting to climate change ('Chew Bahir Project', Grove).

Our public outreach events build on the Heritage theme locally and nationally. The Garstang Museum features exhibitions of our research and organised the first Garstang Festival (2019), with a family-friendly Saturday, showcasing staff/PGR expertise in accessible, engaging formats. We participate in the annual national Festival of Archaeology and 'Being Human Festival' of the Humanities (AHRC-funded). Staff have also contributed to international 'Pint of Science' events held in Liverpool, while the Garstang Museum's late opening as part of Liverpool's 'Light Night', a free one-night arts festival, attracted more than 700 visitors under the theme 'The mummy returns' (2017).

Outreach complements our role as good academic citizens, requiring a commitment of time and willingness to engage with the public. Our research role as creators and disseminators of knowledge about the past brings a responsibility to look inwards and outwards: to address in-house gender disparities and address global issues of sustainability. These are key priorities as we move beyond REF2021 as a unified department.