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Innovation is commonplace in archaeology, a discipline supported by a rich and diverse historic environment sector that benefits from a wide variety of specialisms and collaborations spanning academic, community-led, and developer-funded archaeological research. With continual advancements in technologies and techniques, along with modifications and adaptations in approach to archaeological research, the sector consistently pushes the boundaries, reaches further, and makes new and exciting discoveries and insights into our past. Innovation helps us to acquire *more* knowledge, extract *more* information, and continually enhances our ability to deliver greater and more effective public benefit. Innovation also drives the sector forward to evolve and improve its working practices, learning lessons, making improvements, and gaining knowledge from other sectors. This has led to safe working conditions, increased efficiency, enhanced communication, and a greater awareness of environmental impacts – all aspects well demonstrated by the sector's collective response to the COVID-19 pandemic.

However, it is not always easy or straightforward to implement innovation, especially in commercial archaeology. A recent Historic England-funded project undertaken by ClfA in collaboration with ALGAO highlighted some of the issues and potential barriers being faced by archaeologists trying to embrace innovation – especially on developer-led projects. This included cost, time, and a lack of knowledge about what innovative approaches were available and applicable to certain project types; factors that are compounded on fast-paced projects with tight budgets and even tighter deadlines. These issues were further discussed at the recent ClfA Innovation festival held in January – a fantastic showcase of what our multi-faceted sector can achieve but also a reminder that there are still some hurdles to clear to maximise the potential that innovation has to offer.

This issue of *The Archaeologist* showcases innovation in a variety of settings and project

types from across the UK and further afield to Germany. It is a celebration of innovations that are scientific, digital, technological and managerial, spanning research, commercial archaeology, and community engagement. Emily Johnson from Archaeology South-East outlines a newly developed organisation podcast series created as an alternative way of connecting with people and disseminating information. Craig Huddart from Wardell Armstrong LLP provides a discussion piece on digital innovations in archaeology, with a focus on the pros and cons of digital recording in the field. Rose Malik introduces her doctoral research at Durham University, which focuses on ancient odour molecules using a ground-breaking technique that has the potential to literally bring the past to life via our sense of smell. Peter McKeague, part of the Data Management team at Historic Environment Scotland, outlines the archaeological potential of utilising geospatial data to aid decision making and research in archaeology, whilst Dave Cowley, George Geddes, Łukasz Banaszek, Iris Kramer and Kirsty Millican, also from Historic Environment Scotland (the Survey & Recording team), present an overview of large-area archaeological survey in the age of big data and machine learning. The letter explores the application of automation, AI and machine learning in the detection of archaeological sites and features. Jay Carver, Roger Doonan and Clive Waddington, working for Fusion JV and Archaeological Research Services on behalf of HS2, present the results of a novel solution employed in response to challenging site conditions during an archaeological evaluation, involving the use of geochemical survey. And finally, Regine Müller, from SPAU GmbH in Germany, outlines innovation in relation to organisational structure and management by introducing the first works council to be established in German commercial archaeology. After reading these papers there can be little doubt that archaeology is innovative, which raises the question: what will we discover next?

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