Archaeological Reports (2024), **70**, 239–255
doi:10.1017/S0570608424000085

CAMBRIDGE UNIVERSITY PRESS

ARTICLE

ARCHAEOLOGY IN GREECE 2023–2024

10 The Marc and Ismene Fitch Laboratory: half a century of interdisciplinary archaeological research[1]

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This year, 2024, marks the fiftieth anniversary of the Marc and Ismene Fitch Laboratory for Archaeological Science. Since its inception in 1974, this pioneering laboratory has grown from an experiment into a world-renowned hub for archaeological science. As one of the first laboratories of its kind in Greece, and among only a few globally, the Fitch Laboratory expanded its expertise over the decades to encompass a wide range of disciplines. These include archaeobotany, zooarchaeology, human osteology, geophysics, pigment analysis, and its most recognized focus: archaeological ceramics. This paper reviews its history and development, and looks to the future.

Athens, Friday 29 November 1974

It is the time of regime change and political transformation in Greece (Μεταπολίτευση – Metapolitefsi). The memories of the seven years of dictatorship and the recent tragedy in Cyprus are still fresh. However, a wind of democracy, freedom, optimism, and creativity is blowing. At this moment in time, an interesting experiment began at Souedias 52 in Kolonaki. An experiment whose success opened new perspectives for Greek archaeology, but also had a significant impact on the development of the field of archaeological science at a global level.

Then director of the BSA, Hector Catling welcomed representatives of the Hellenic Archaeological Service and other foreign schools in Athens, along with Sir Brooks Richards, the British Ambassador to Greece, and Neville John Williams, the newly appointed Secretary of the British Academy, to a celebration. The event marked the official opening of a research laboratory – The Marc and Ismene Fitch Laboratory for Archaeological Science – the first 'archaeometry' laboratory in Greece and one of the first in the world. The establishment of the laboratory was a pioneering, although risky, venture. This is readily apparent when comparing the Fitch Laboratory with other 'archaeometric'[2] laboratories of the time, which were established within large national research centres or universities with access to already existing high-level infrastructure and training. Such laboratories were already operating at the University of Oxford in the UK and the University of California, Berkeley, and the Brookhaven National Laboratory in

[1] The current paper draws significantly from a previous publication in Greek (Kiriatzi 2022).

[2] The new field in archaeology involving the use of scientific methods and techniques for the study of various materials addressing a variety of research questions was originally called 'Archaeometry', used most commonly to describe the field that deals with the analysis of inorganic materials and sites, rather than, for example, biogenic materials. With time, and following developments both in the theory and the practice of archaeology, different terms were adopted, with 'Archaeological Science' the current favoured term.

the USA. The establishment of the Fitch Laboratory in Greece would soon be followed by the emergence of another archaeometry laboratory in the National Centre for Scientific Research, 'Demokritos'.

In the years that followed, the small laboratory of the BSA, with its limited equipment (only for elemental analysis of inorganic materials and geophysical prospection), eventually proved to be a very successful experiment that paved the way for other such laboratories both in Greece and abroad. At present, there are more than 12 laboratories or research clusters in Greece alone – across various universities and research centres – dedicated to various aspects of archaeological science, and numerous centres across Europe, north America, and beyond. Although the Fitch Laboratory gained access to specialized equipment and developed high-level infrastructure, its most important feature has always been its close connection with archaeological research as it is part of an organization, the BSA, which is closely linked to humanities studies. From the beginning, the emphasis was on the use of techniques, borrowed from other scientific disciplines, to explore questions primarily focusing on provenance or technology of inorganic materials – such as the provenance of Minoan and Mycenaean pottery found in many sites of the Aegean and east Mediterranean (Jones 1986a), or archaeometallurgy (Photos, Koukouli-Chrysanthaki and Gialoglou 1986), or the geophysical prospection of archaeological sites to map buried antiquities (e.g. in Thassos, Stymphalos, etc.) (Jones 1986b).

The course of the laboratory has always followed the trends and developments in the field of archaeology, and thus its contribution was key in creating bridges of cooperation between archaeology and the natural sciences in Greece and beyond. Furthermore, the Fitch Laboratory played an important role in familiarizing archaeologists, both Greek and international, with the possibilities of applying natural sciences to archaeological research, and, of course, made a key contribution to the training of early career archaeologists and natural scientists in these interdisciplinary collaborations. More broadly, this laboratory has contributed to linking Greek archaeology and the archaeological community with international developments in the field, in close collaboration with pioneering centres in Britain such as the Oxford Research Laboratory for Archaeology and the History of Art, the Department of Prehistory and Archaeology at the University of Sheffield, the Institute of Archaeology at University College London, and the McDonald Institute for Archaeological Research of Cambridge University, to name but a few. Its contribution is therefore linked both to the wider adoption of new research practices in Greece and to the creation of a new generation of archaeological scientists who have played, and continue to play, an important role in international developments in the field of archaeology.

The birth of the Fitch Laboratory

Although the inauguration of the laboratory took place at the end of 1974, the broader processes that gave birth to the phenomenon of 'archaeometry' had begun much earlier. As early as the beginning of the twentieth century, natural scientists were participating in archaeological field research and studies of finds both in Greece and abroad, and their reports often appeared as appendices to archaeological publications. However, the significant shift towards the applications of natural sciences in archaeology is essentially marked from the 1960s onwards, particularly under the influence of the New Archaeology movement in North America and Europe (Binford 1962; Brothwell and Higgs 1963). Major changes in the prevailing theory and methodology of archaeology were combined with increasing confidence in the contribution of the natural sciences to the research of human history, giving impetus to interdisciplinarity.

These developments were notable in Britain, where, as early as 1955, the Oxford Research Laboratory for Archaeology and the History of Art (RLAHA), one of the first

Fig 10.1. Two pioneers linked to the birth of the Fitch Laboratory. Left: Martin Aitken in the field (source: T. Hingham); Right, Hector Catling (BSA Archive). © BSA.

'archaeometric' laboratories in the world, was formed. Its first director was Edward 'Teddy' Hall, with Martin Jim Aitken as deputy director, both of whom later played an important role in the founding of the Fitch Laboratory (Fig. 10.1). From 1958, the research of the RLAHA began to be published in an annual newsletter titled *Archaeometry*, which continues today and is one of the most respected international journals in the field. In the fourth issue of *Archaeometry*, in 1961, an article was published by Catling, Eva Richards, and A.E. Blin-Stoyle, entitled 'Spectrographic analysis of Mycenaean and Minoan pottery'. This article heralded a series of developments that eventually led to the founding of the Fitch Laboratory in Athens nearly 15 years later. The relevant research originated from an idea by Martin Sinclair Frankland Hood, then director of the BSA (1954–1962), to use the newly established RLAHA to investigate the chemical differentiation of the raw materials used by potters in the Late Bronze Age at sites in mainland Greece, Crete, and the islands. The aim was to evaluate the possibility of determining the provenance of ceramics found at various archaeological sites in the eastern Mediterranean. This collaboration brought the then senior assistant keeper in the Department of Antiquities at Oxford University's Ashmolean Museum – and future director of the BSA (1971–1989) – Hector Catling into contact with the RLAHA, and marked the beginning of a long and meaningful relationship between Hall and Aitken with the BSA (Catling 2005).

At the same time, during the decades of the 1960s and 1970s, pioneering field research programmes began in Greece, introducing new concepts and practices to the field of Greek archaeology (such as palaeoeconomies, palaeoenvironments, zooarchaeology, archaeobotany, etc.). Many of the first such interdisciplinary field investigations were associated with the BSA and were carried out by British universities (Boyd and Kiriatzi 2005). These were excavations or survey investigations by research teams that included archaeologists as well as scientists from various branches of the natural sciences, who collaborated closely in planning and conducting field investigations and studying various categories of

finds. These were the survey investigations and excavations of the University of Cambridge team led by Eric Sidney Higgs in Thrace, Macedonia, and Epirus, as well as the excavations of the Neolithic settlements in Nea Nikomedia, Sitagroi, Saliagos, and Knossos (e.g. Rodden *et al.* 1962; Dakaris *et al.* 1964; Higgs and Webley 1971). These investigations laid the foundations for a more systematic study of the Palaeolithic and Neolithic periods in Greece. Their contribution is significant not only because they provided new, often challenging data for specific periods and regions, but also because they paved the way for the essential interdisciplinarity that now governs modern archaeological research.

While favourable conditions were created for the emergence of interdisciplinary archaeological research in Greece, the collaboration between the RLAHA and the BSA continued throughout the 1960s, as evidenced by a series of publications in *Archaeometry* and the *Annual of the British School at Athens* (Catling 1963; Catling, Richards and Blin-Stoyle 1963; Catling and Millet 1965a; 1965b). Beyond research, these collaborations cultivated and strengthened the personal relationships between all involved. The frequent contacts in the laboratory, as well as meetings at college dinners at the University of Oxford, provided excellent opportunities for discussions on new innovative ideas. One of these ideas involved establishing a laboratory at the BSA in Athens, where part of the research of the Oxford laboratory would be transferred, mainly in relation to the analysis of archaeological ceramics from Greece. At that time, the RLAHA, already having considerable experience in ceramic analysis, was turning to new methodological investigations that dealt primarily with scientific dating methods and the analysis of new materials. The original idea appears to have been Aitken's and was immediately very favourably received by both his now close associate Catling, who had just been elected director of the BSA, and the School's chairman of the board, Vincent Desborough (Catling 2005).

Catling came to Athens to take up his new duties in 1971, and immediately proceeded to promote the idea further by drawing up a detailed proposal for the creation of such a laboratory, at this time referred to as the 'Mini-Lab'. The proposal was submitted for discussion to the Managing Committee of the BSA and, with a vote of nine in favour and three against, was approved. In December 1971, a related official request was made to the Greek Ministry of Culture and General Inspector of Antiquities Spyridon Marinatos. The written approval of the request by the Ministry of Culture was immediate and positive, as evidenced by a permit document dated 24 January 1972.

The next objective was to secure the required funds for the realization of this project, which concerned both the capital funds for creation of the laboratory and its running costs, predicted to be around £18,500 and £6,000 respectively in 1971. Despite the generally positive attitude of the BSA's Managing Committee to the founding of the laboratory, there were serious concerns about the viability of fundraising for this new project:

> You will have heard with what great success the Mini-lab proposal came before the Managing Committee of the School on Thursday ... You will realise, of course, that there is still a long way to go – the hardest part of the journey, in fact. A sub-committee has been appointed to undertake the attempts at fund-raising, and I hope they will press on as hard and as fast as possible. (Catling 1972)

A sub-committee was appointed to undertake this fundraising effort and to manage the progress of the establishment of a laboratory at the BSA; it included Desborough, John Boardman, Peter Edgar Corbett, and Hall. A list of trusts and foundations were discussed across various letters between the committee members. Once in agreement, they formulated a letter and sent it, in early 1972, to at least eight organizations and foundations. The committee also contacted the British Academy, with the hope they would cover the capital cost of the proposed laboratory.

All but two of these were unsuccessful. The most common responses state that the trust/fund had already committed all their funding for the next one to three years, and so would not be able to help at this time and/or that they do not give money to institutions based outside the UK. Other responses reflect the financial state of the country (UK) as well as developments in the field of science-based archaeology at this time. They talk of 'the current situation' as a reason they cannot commit any money 'at this time'. This, we believe, is in reference to the dramatic increase in inflation in the UK (and elsewhere), beginning in the early 1970s and peaking in 1975 at 24.2% (Soteri and Westaway 1993). Another problem highlighted by the responses to the funding applications, and primarily in relation to the British Academy, was that there was no remit within the current guidance on funding science-based research in archaeology by the British government, and therefore the BSA would have to rely on the support of private foundations (Allen 1973).

There are two letters, both from Derek Allen (the secretary of the British Academy 1969–1973 and then treasurer 1973–1975), that describe a planned meeting with the British government on this matter. He indicates that the British Academy had been in conversation with the Royal Society and the National Environment Council and hoped to create a standing joint committee. Until this happened, the British Academy would not be able to provide the money for the establishment of a 'Mini-Lab'.

The only two successful applications from this round of fundraising were those to the Worshipful Company of Goldsmiths and to Arthur Guinness Son & Company Limited, who each promised to give a small amount of money.

In the background, while all these fundraising efforts were going on, Dr Francis Schweizer was preparing to become the first research fellow of the 'Mini-Lab' in Athens. It appears from letters within the BSA archives (Catling Papers) that he had been suggested by RLAHA and that he was approached prior to the first proposal to the BSA Managing Committee in 1971. Schweizer was actively involved in the writing of the 1971 proposal and responsible for calculating the estimated figures for the capital and running costs required. In May 1973 panic appears to have set in for the Mini-Lab sub-committee, when Schweizer informed them that he was offered another job in Geneva. They realized quickly that they could not expect him to decline this offer with little funding secured for the lab in Athens. Nick Hammond wrote to Allen on 14 May 1973 (Hammond 1973a) in the hope that the British Academy would change its mind and fund the capital expenses:

> We are reaching a rather critical stage at our end in regard to the laboratory for science-based archaeology. Dr. Hall has had in mind Mr. F. Schweizer, at present at Oxford, to take charge of such a laboratory at Athens, but Mr. Schweitzer has now been offered a post at Geneva and cannot defer a decision as between Athens and Geneva beyond the end of May. On the other hand, the Managing Committee agreed to press ahead further requests for financial assistance towards the capital cost of setting up a laboratory, but it thought it wise to set its next meeting on May 24th as the target date for the termination of its efforts.

Allen replied, explaining the British Academy had not changed its position and was unable to offer the capital needed, referring once again to the issue over funding archaeological science. He did indicate in this letter that the British Academy should be able to cover the running costs of the laboratory if the capital is raised. Schweizer took up his position in Geneva and the sub-committee proposed to keep looking for funds despite their earlier statement to Allen regarding their 'termination of its efforts'.

Not long after this, Aitken was at dinner in Linacre College, University of Oxford, and happened to be sitting next to Marc Fitch (Catling 2005), an English historian and philanthropist. Fitch gave generously to the BSA in his lifetime and facilitated the building

and extension of the BSA's buildings both at Athens and Knossos (Megaw 1976). It appears from correspondence between Hammond and Fitch on 4 June 1973 (Hammond 1973b) that conversations over dinner turned to the fundraising efforts for a laboratory in Athens. From this letter it appears likely that Aitken described the 'largely unsuccessful efforts to raise the necessary capital to launch the project' and Fitch 'expressed great interest in the scheme'. In this letter, Hammond presented the proposal of the 'Mini-Lab' to Fitch and detailed the amount of capital money still required. On the 14 June 1973, Fitch wrote to Hammond (Fitch 1973) offering £10,000 on the condition that the British Academy and/or the Royal Society, or some other institution, guarantee the annual running costs.

From this point on, things moved rapidly. Allen confirmed that the British Academy could cover the running costs and therefore Fitch organized for the funds to be transferred. The Mini-Lab sub-committee lamented over the fact that it came too late to secure Schweizer for his intended position but began the search for the individual who would come and manage the laboratory in his place.

An advert for the job was placed in *New Scientist*, a popular science magazine, and it was very fortunate that Dr Richard Jones applied. After interview and subsequent appointment, Jones spent three months training at RLAHA under the supervision of Hall and Aitken and then undertook the long drive to Athens – following a van full of equipment donated by the RLAHA, alongside materials for Hall's boat which was docked at Piraeus – and arrived to begin setting up the laboratory in May 1974.

The official opening took place six months later, at the end of November 1974, in the presence of Marc and Ismene Fitch, as well as many Greek archaeologists and members of other foreign schools in Athens (Fig. 10.2). British Ambassador to Greece Sir Brooks Richards declared its opening and announced its name: The Marc and Ismene Fitch Laboratory for Archaeological Science.

Developments in the history of the laboratory

The 50-year journey of the Fitch Laboratory is characterized by continuous development in terms of its activities and collaborations, as well as expansion in terms of space, infrastructure, and equipment, following international technological and methodological advancements in relevant fields. The laboratory was initially housed in the so-called 'West House Apotheke', a three-room building in the garden of the BSA, built in 1958 to cover the institution's growing needs for storage. In 1974, the largest of the three rooms was refurbished and fitted with a new electrical installation and air conditioning to accommodate the equipment that arrived by road from Oxford. The installation of equipment for elemental analysis by optical emission spectroscopy and X-ray fluorescence spectroscopy was the initial task for Jones.

In the years that followed, the laboratory conducted numerous analyses within the context of research programmes related to the study of ceramics from various periods and regions, creating significant collaborations with the Greek Archaeological Service and research institutes in Greece as well as with other foreign schools in Athens. At the same time, the first geophysical surveys were carried out at archaeological sites in Greece with equipment also donated by the RLAHA.

In 1987, after 13 years of successful operation reflected in a landmark publication (Jones 1986a), the BSA, on the occasion of its centenary celebration, decided to extend the Fitch Laboratory. The construction of the new building, which opened on 14 April 1988 (Fig. 10.3), was made possible thanks to the generosity of Fitch. Additional donations to cover the necessary equipment were made by Ismene Fitch, Charles K. Williams II, the Institute for Aegean Prehistory (courtesy of Malcolm Wiener), and Grindlay's Bank (courtesy of Robert Wild). The plans for the new Fitch, by architect Nikos Zarganis,

Fig. 10.2. The opening of the Fitch Laboratory in 1974. Clockwise from left: a) the newly opened Fitch Laboratory; b) and c) two photos inside the laboratory with members of the Athens archaeological community and friends of the BSA; d) Richard Jones and Hector Catling in the Upper House of the BSA for the reception. © BSA.

Fig. 10.3. The Fitch Laboratory extension in 1988. Clockwise from left: a) watercolour of the newly extended Fitch Laboratory (N. Zarganis, BSA Archive); b) Richard Jones (top) and c) Hector Catling (bottom) giving speeches at the opening in the Fitch Laboratory (R. Jones, BSA Archive). © BSA.

included a small extension of the existing ground floor 'West Wall Apotheke' building, which had been gradually occupied by the laboratory, and the addition of another floor. The now spacious two-storey building of the laboratory has a total area of over 220m^2, in contrast to the original room of 45m^2 where it was hosted during the first years of its operation. The new building, in an architectural style harmonized with the existing BSA buildings, had specialized spaces for the various phases of elemental and petrographic analysis of ancient objects, increased space for sample storage, and office space. For the first time, space for environmental archaeological studies was also created.

In the years that followed, the laboratory continued to develop its activities, renew and expand its equipment, and increase its staff. The BSA received significant support for the further development of the laboratory, both from the Fitch family and from Charles K. Williams II, who became the main sponsor of the laboratory. The British Academy continued to cover its running costs. The renewal and expansion of the equipment, combined with new analytical practices, created the need for reorganization and readjustment of its premises.

The most important change of this kind, which was also combined with a small-scale building renovation of the laboratory, took place in 2009. It primarily concerned the redevelopment of the ground floor of the building for the 'chemistry unit', which was, and still is, equipped with a wavelength dispersive X-ray fluorescence (WD-XRF) spectrometer, combined with specialized infrastructures for sample preparation of fused glass beads (Fig. 10.4). At the same time, a new specialized area for research grade microscopes was created, and the existing equipment was improved with new microscopes and digital photography systems to serve an ever-growing number of researchers. Finally, a suitable space was created to host seminars and laboratory teaching courses. The space was

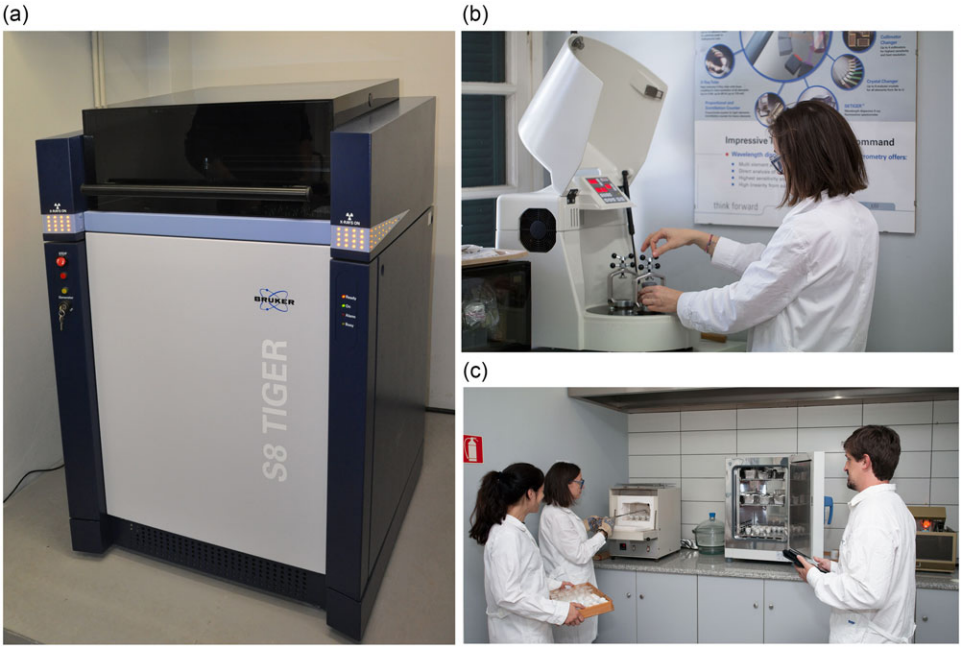


Fig. 10.4. The 2009 update to infrastructure and facilities. Clockwise from left: a) the Bruker S8 Tiger WD-XRF, affectionately known as Babis; equipment for sample preparation in use by Fitch staff b): Zoe Zgouleta; c) Maria Choleva, Zoe Zgouleta, and Leandro Fantuzzi (Chavdar Tzochev, BSA Archive). © BSA.

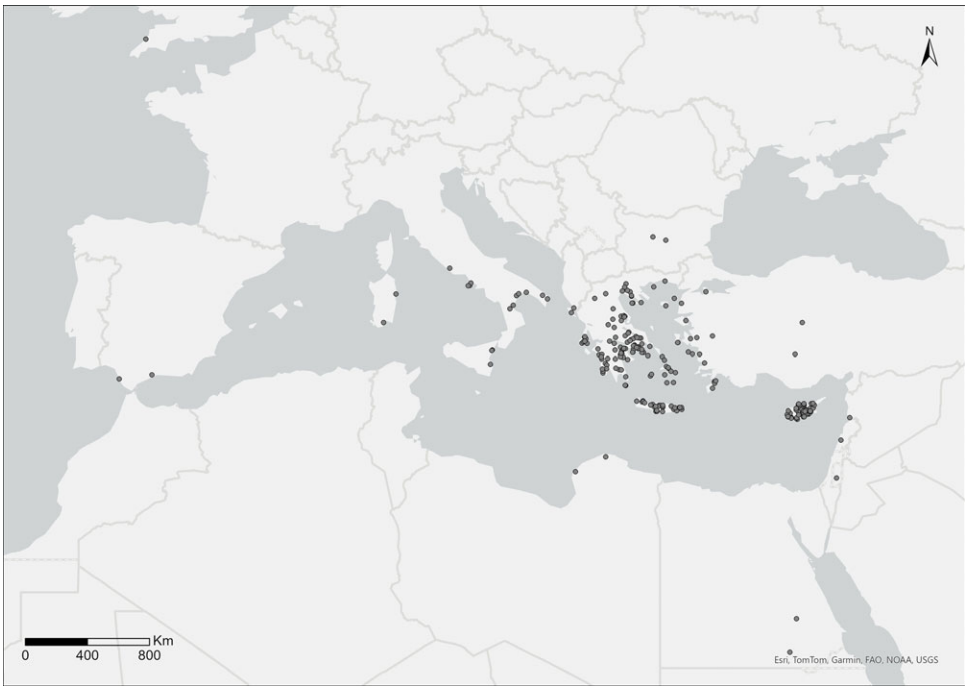
equipped with 12 teaching microscopes and a unique reference collection of thin sections of minerals, rocks, and experimental ceramics that were developed for teaching purposes.

The aforementioned upgrade of the infrastructure of the Fitch Laboratory in 2009 marked the beginning of a new phase in its history, with increasing emphasis on the training of new researchers (as detailed below) through organized theoretical and laboratory courses alongside the further development of research programmes and collaborations. The financial support of Charles K. Williams II, as well as that from the Bradford McConnell Trust, which mainly concerned teaching infrastructure, was of significant importance in this upgrading of the laboratory.

The Fitch Laboratory's research

Today, the laboratory is mainly a centre for the study and analysis of ceramic materials, having specialized equipment for petrographic and elemental analysis. This equipment can also be used to analyse stone, metal, pigments, and soils. In addition, it has infrastructure for bioarchaeological research, mainly in the fields of osteoarchaeology (the study of animal and fish bones as well as human remains) and archaeobotany. Finally, it has equipment for geophysical analysis of archaeological sites.

Over 200 research projects have been carried out, hosted, or supported to date by the Fitch Laboratory in its 50 years of operation, producing numerous publications and advancing knowledge of the ancient world as well as research methodologies. Most of them concern places and areas of Greece, but more frequently they also extend to other areas, mainly the Mediterranean but reaching as far as the south of Britain (Map 10.1). Part of our current work aims to digitize these projects and present them on the BSA website.



Map 10.1. The distribution of ceramic-based projects completed or ongoing, hosted at the Fitch Laboratory from 1974 to 2024. © BSA (E. Gkadolou and E.Kiriatzi).

Geophysical analysis of archaeological sites

The Fitch Laboratory has had equipment for geophysical analysis since its inception, and a number of important projects have been carried out by laboratory staff and collaborators at archaeological sites throughout Greece (such as kilns sites in Thassos, Stymphalos, Plataies, Philippoi, Palaekastro, etc.), often in collaboration with other foreign schools. The equipment, which has been renewed from time to time, is mainly intended for resistivity and magnetometry surveying. Geophysical surveying aims to locate and map subsurface remains, based on their measured geophysical properties and their differentiation with respect to earth works and other components in the burial environment.

The use of computers and the enormous development in information technologies have brought about dramatic changes in the applications of geophysical surveying in the investigation of archaeological sites, with a huge increase in the ability to collect and process data. It is noteworthy that in the first such surveys by the Fitch Laboratory in Greece, during the 1970s, both the recording of the data and their graphical display were done by hand. At the beginning of the 1980s, the use of computers in the field created new perspectives for coverage of a larger area and better quality in the processing and visualization of the results (e.g. Jones 1986b). Continued technological development now makes it possible to undertake investigations of a much larger scale conducted in much shorter time intervals. A representative example of such an extensive geophysical survey was undertaken at the Philippi archaeological site of Kavala (ID10001, ID9403) as part of the Fitch Laboratory's collaboration with the French Archaeological School (Boyd and Provost 2001; Provost and Boyd 2002). A total of 18 hectares of the site was surveyed, much of it remained unexcavated but, with this large-scale survey, the urban plan was revealed in remarkable detail in parts of the ancient city that had not yet been explored.

Bioarchaeological investigation

At the beginning of the 1990s a series of systematic reference collections for the study of biological remains (animal bones, fish, shellfish, and seeds) were created in the newly renovated and expanded Fitch Laboratory. These collections followed the standards of corresponding collections of the Department of Archaeology at the University of Sheffield, which was one of the pioneering centres in environmental archaeology studies worldwide.

The growing number of archaeozoologists and archaeobotanists using the laboratory's reference collections includes Greek and international researchers, often those pursuing postgraduate degrees in environmental archaeology and bioarchaeology in Britain, other European countries, and more recently in Greece. The establishment of an annual round of scholarships from the laboratory (Fitch Bursaries) from 2005 onwards contributed significantly to this trend, along with cooperation with the services of the Ministry of Culture. The latter supports and institutionally supervises all these investigations, which require the transfer of archaeological finds to be studied in the laboratory.

Most of these bioarchaeological studies concern findings from rescue or research excavations mainly by ephorates of antiquities in locations in Macedonia and central Greece, but primarily in Attica and Boeotia. This collaboration, which has developed particularly in recent years, not only promotes bioarchaeological research in Greece but also contributes significantly to the systematic study and publication of very important and large-scale rescue excavations by the Ministry of Culture in settlements and cemeteries – such as in Kleitos Kozanis (e.g. ID6600), Proskynas Fthiotidas (e.g. ID917), Kolikrepi Spaton, and Koropi Attica (e.g. ID2475) (Kiriatzi, Papakonstantinou and Gerousi in press).

A centre for ancient pottery research

Since the first establishment of the laboratory, ceramic analysis has been its primary activity. Naturally, over its five decades of operation, there have been significant changes in the questions, methodology, and scale of research on ancient ceramics, always following wider developments in the theory and methodology of archaeology more generally. The Fitch Laboratory has not only followed this but led in developing certain techniques and approaches, for example the development of the application of thin-section petrography to archaeological ceramics and the ceramic landscape approach. These changes and developments are recorded in a series of publications of the laboratory, including those by Jones (1986a), Whitbread (1995), Gauss and Kiriatzi (2011), and Kiriatzi and Knappett (2016).

The early investigations of the Fitch Laboratory by Jones essentially continued the work by the RLAHA, as it was shaped through collaboration with Catling and in collaboration with them. It focused on determining the provenance of pottery of Minoan and Mycenaean styles, but gradually included pottery of other periods, such as the Neolithic, Geometric, and Classical periods. The investigation of provenance was carried out using chemical (elemental) analysis and was based on the creation of 'reference groups'. In 1986, Jones, who became the first director of the laboratory, published a volume, *Greek and Cypriot Pottery: A Review of Scientific Studies* (1986a), which included all data up to that point on pottery provenance studies from the Fitch Laboratory and from other published work by other research groups. This volume was an important milestone in the history of the Fitch Laboratory as well as more broadly in the field of archaeological pottery studies in Greece and the eastern Mediterranean.

The growing experience and understanding of all the parameters of the relevant research created a climate of optimism and constructive reflection that led to methodological explorations. Therefore, at the end of the 1970s, following the leading

role of the Southampton Department of Archaeology (Peacock 1977), the experimental application of a new ceramic analysis technique in the laboratory, thin-section petrographic analysis (also referred to as ceramic petrology), began. This new technique offered the combined study of the provenance and technology of archaeological ceramic materials and for the definition of more precise reference groups, since it provided the possibility of correlating their mineralogical composition with the geology of the area they were produced in.

The application of ceramic petrology at the Fitch Laboratory developed significantly in the 1980s through Ian Whitbread's research on the transport amphora and production centres of the ancient Greek world as well as significant development of the technique, originally used in geology, for application to archaeological ceramics. The technique continued to be applied and developed by other researchers in the 1980s and 1990s, such as Peter Day (1988), Sarah Vaughan (Vaughan, Kilikoglou and Papagiannopoulou 1995), Louise Joyner (2007), Evangelia Kiriatzi (2003), Jill Hilditch (Hilditch *et al.* 2008), Marie-Claude Boileau (Boileau and Whitley 2010), and others. The research by Whitbread, who was appointed director of the Fitch Laboratory from 1992 to 2001, was published in 1995. The volume was, and still is, an international standard textbook on applied ceramic petrology.

In parallel, a number of the early broader projects of the Fitch Laboratory (e.g. Jones 1986a; Day 1989; Whitbread 1995) studied and recorded the practice of modern traditional potters; the way they selected and processed their local raw materials proved to be key in approaching the technological choices of the ancient craftspeople.

In the years that followed, these innovative ideas and methodologies were tested in various ways, mainly in the context of two research programmes that made a key contribution to shaping the current approach to the laboratory's research. These two studies concern the diachronic research of the pottery landscapes in Kythera (Broodbank and Kiriatzi 2007; 2014; Kiriatzi and Broodbank 2021) and Aegina, which started almost simultaneously in around 2000 (Gauss and Kiriatzi 2011). The now established methodology inextricably combines the two techniques, petrographic and elemental analysis, as well as the sampling, experimental processing, and analysis of available raw materials from the area under study. Additionally, where possible, a parallel study of traditional potters and analysis of their products is carried out.

Beyond the methodological developments, there was also a significant change in the questions asked of the material – following wider developments in the field. Thus, the application of methods from the natural sciences to the study of ceramics by the Fitch Laboratory no longer aims simply to determine provenance but to understand all aspects of the biography of a ceramic vessel in order to approach its producers and consumers. This research forms the basis for a new approach to questions concerning the organization of production and diffusion of technological traditions and consumption practices, key to the study of innovation, identities, and human mobility in the past (e.g. Kiriatzi 2010; Kiriatzi and Andreou 2016; Gardner *et al.* 2020; Lis *et al.* 2020).

The Fitch Laboratory's research programmes now have a different geographical and chronological context, as emphasis is placed on the development of diachronic research on the phenomena of pottery production and circulation in specific locations and their landscapes. Such studies have been carried out by the laboratory in many places in Greece and the wider region of the Aegean and east Mediterranean (Gait *et al.* 2018; Marzec *et al.* 2019; Amicone *et al.* 2022), while in recent years the research activities have expanded to the central and western Mediterranean (e.g. Müller *et al.* 2019; Fantuzzi *et al.* 2020; 2024) as well as to the British Isles (e.g. Duggan and Kiriatzi 2019; Duggan, Kiriatzi and Müller 2019).

Importantly, the Fitch Laboratory also invests significantly in publishing its research, both the results and the research process itself, through publications of various formats and through the organization of relevant events for both the scientific community

(conferences, thematic workshops, lectures) and the general public (guided tours and educational programmes for various ages and educational levels).

The Fitch Laboratory as a training centre for young researchers

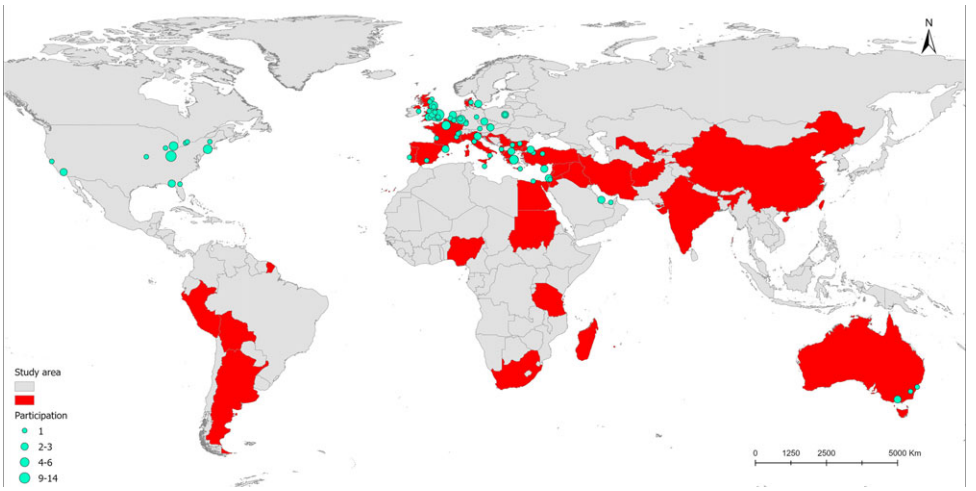
The training of new researchers has been a key objective of the laboratory since its inception. This focus on developing the next generation of archaeologists is seen as an investment in the future of both the laboratory and the broader field. Over the years, the Fitch Laboratory has trained hundreds of researchers who have significantly influenced archaeological advancements in Greece and internationally. The educational role of the laboratory encompasses several initiatives.

One major initiative involves participation in internship programmes for undergraduate and postgraduate students, such as ATLAS, Erasmus+, and the Turing Internship Network. These programmes aim to acquaint students with the organization and operations of research groups, as well as their research practices and goals, thereby providing comprehensive professional orientation. In recent years, the Fitch Laboratory has annually hosted two to three interns, often in collaboration with other departments of the BSA. Many interns have returned as postgraduate or doctoral students, or professional researchers.

Additionally, the laboratory offers short-term scholarship programmes (one to three months) for doctoral students or early career postdoctoral researchers through Fitch Bursaries. These programmes enable scholars to conduct part of their research at the laboratory, utilizing its infrastructure and collaborating with its researchers. The Fitch Laboratory hosts two to four such fellows each year on average.

The laboratory also supervises and guides postdoctoral students from Greece, Britain, and other European countries, often within externally funded programmes. These fellowships allow researchers to join the laboratory's team and gain experience in all stages of research, both independently and in various collaborative projects. Funding for these fellowships comes from the laboratory's own programme (The Williams Fellowship in Ceramic Petrology) and through targeted external funding applications, such as the British Academy, Marie Skłodowska Curie Actions, the Institute for Aegean Prehistory, the National Science Fund (USA), the Austrian Science Fund, and many more. Each year, the laboratory hosts at least three to four postdoctoral fellows in its research team.

Furthermore, the laboratory organizes intensive training courses. In 2010 it introduced an annual two-week course titled 'Introduction to Ceramic Petrology', aimed primarily at PhD students and postdoctoral researchers specializing in ceramics, taught by Evangelia Kiriatzi and Ruth Siddall (UCL) with the help of Fitch fellows and associates. The essential infrastructure and equipment, for example a set of 12 teaching microscopes, was made possible through a grant from The Richard Bradford McConnell Fund. The high number of global applications (30–50 each year) for the 12 available spots each year underscores the growing recognition of ceramic petrography and the laboratory's crucial role in this field (Map 10.2). Participants often become Fitch fellows or collaborators. In 2019 the laboratory launched another one-week intensive seminar on 'Glass in the Mediterranean and Near East', taught by Professor Ian Freestone (UCL) and Dr Yael Gorin Rosen (Israel Antiquities Authority) with the help of Carlotta Gardner (Fitch Laboratory, BSA). Additionally, laboratory researchers frequently teach on other BSA courses, such as the 'Prehistoric, Greek and Roman Pottery Course' at the BSA's centre at Knossos, as well as on externally run courses for postgraduate programmes at various universities and institutions. For example, a recent course 'Archaeological Ceramics: From Theory to Practice' at the Institute of Archaeology, Jagiellonian University, was taught by members of the Fitch Laboratory's team (Edyta Marzec, Sergios Menelaou, and Georgia Kordatzaki).



Map 10.2. The wide source of participants taking the Ceramic Petrology course between 2010 and 2023, and their study regions. © BSA (D. Nenova, E. Gkadolou and E. Kiriatzi).

More recently, the laboratory has also been focusing its attention on outreach activities for school children, with an aim of opening the laboratory and its research to a range of audiences from school children and providing alternate examples of routes into STEM. Examples of this type of activity have included inviting classes from Greek primary schools for workshops in the laboratory (in collaboration with Museum Educator Dr Popi Georgakopoulou), participating in teaching courses for British Schools in Greece, and running a workshop at the Athens Science Festival 2023 and at the British Academy Summer Showcase 2024 (in collaboration with Dr Tulsi Parikh, BSA Leventis Fellow 2021–2024).

People, partnerships, and funding

As has likely become evident throughout this paper, the people that have spent time at the Fitch Laboratory have been numerous and they have all helped to shape what it is today. Through their research efforts and other contributions, the laboratory is a product of all those who have passed through the doors in the past 50 years.

These individuals include the laboratory's staff, both research and support, as well as personnel from other BSA departments. Many have participated in the laboratory's educational activities, such as lessons and practical training courses. Visiting researchers, both students and academics, have utilized the laboratory facilities in a variety of ways. External collaborators in various research and teaching endeavours have helped to organize events such as conferences and educational programmes; these partners come from institutions and organizations in Greece, Britain, and beyond.

The Fitch committee members have also played a crucial role. From the first chairman, Hall, to the current chairman, Dr Carl Heron (British Museum), many prominent academics and researchers from British institutions have generously provided valuable advice and oversight for the laboratory's strategic planning, operations, and activities.

Finally, supporters such as Marc and Ismene Fitch, Mr Charles Williams II, Malcolm Wiener, and members of the Richard Bradford McConnell Trust have been instrumental in the laboratory's success. Without their contributions, the Fitch Laboratory might not have existed or achieved its current level of success.

The future of Fitch

As the Fitch Laboratory turns half a century old, the memory of its grand opening ceremony that autumn afternoon in 1974 in the BSA's 'West House Apotheke' is fading, but, importantly, the project succeeded. The results of the efforts of Catling, Jones, and all their collaborators and supporters continue to carve new paths across archaeological science, ensuring the Fitch Laboratory stays at the cutting-edge of research and training in archaeological ceramics, as well as developing and diversifying its capabilities for research across other materials and fields, such as archaeometallurgy, analysis of vitreous materials and soils, osteoarchaeology, and archaeobotany. Increased emphasis on experimental archaeology, which is considered fundamental for developing knowledge of various crafts and practices, will feed into our enhanced training programmes, which will continue to include courses, internships, and postgraduate supervision, but also into outreach activities aiming to communicate and engage with the wider community, including contemporary craftspeople, artists, and school pupils. Growing emphasis on the role of digital technologies promises enhanced sharing, communication, and collaboration in the coming years.

The achievements and successes, as well as the failures that became lessons, form the basis for the strategic planning of the laboratory's actions in the coming decades. Without doubt, the individuals associated with the Fitch, past and present, are its most valuable achievement. All those who now create a network of collaborations and support that is constantly expanding and strengthening are the most important guarantee for the future of the laboratory and the challenges it will face in the next 50 years.

Acknowledgements. We would like to thank Amalia Kakissis for her continued support during our research into the history of the Fitch Laboratory, as well as the many interns who have helped with this research: Benji Hess, George Richards, and Genevieve Lascombes. We are always thankful to Zoe Zgouleta for her help, and particularly here in this paper for her assistance.

Competing interests. Evangelia Kiriatzi wrote this while director of Fitch Laboratory and Carlotta Gardner while Fitch 2024 research and outreach officer.

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Cite this article: Kiriatzi, E. and Gardner, C. (2024) The Marc and Ismene Fitch Laboratory: half a century of interdisciplinary archaeological research. *Archaeological Reports*, 70, 239–255. https://doi.org/10.1017/S0570608424000085