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## EXPERIMENTAL ARCHAEOLOGY

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What is an experiment? What is experimental archaeology? There is in fact scholarly consensus about the answers to these questions (Callahan, 1999; Coles, 1976; 1979). Experimental archaeology involves examining craft techniques and the traces of usage on tools and materials, as well as retracing the correlations between events, techniques, and everyday life in the past. Experimental archaeology does so by conducting scientific, methodologically designed studies in which the size of the variables can be altered and empirical data and information can be gained. The process is completed by the formulation of research questions, the design of an experimental setup, measurements, documentation, and repetition of the experiments. This approach makes it possible to make statements and formulate hypotheses, which can in turn be subject to further testing. Reenactment and LIVING HISTORY draw on aspects of experimental archaeology and its findings, but also extend these. They are coterminous with experimental archaeology but do not (only) focus on experimentation, and thus constitute separate fields of inquiry.

Among the founding fathers of the scientific experimental method are Galileo Galilei (1563–1642) and Francis Bacon (1561–1626) (Richter, 1991). The modern natural sciences emerged from the combination of knowledge and technology in the 16th century. Here, deduction and induction, the natural sciences and the humanities, and experimentally acquired insights versus analogizing were all set in opposition. The empiricist Bacon formulated the methodological steps necessary for acquiring knowledge: formulation of a question, development of hypotheses, experiment, falsification, hypothesis, report, and always: “Think, try it again.”

The conflict between inductive and deductive methods is evident in contemporary debates over experimental archaeology and some of its methodological approaches. This is particularly so in the question of who invented experimental archaeology. In Switzerland, experimental archaeology dates back to early research on prehistoric pile dwellings. As early as 1856, the Antiquarian Society of Zurich commissioned looms from textile craftsmen and, after 1860, for example, commissioned model houses for the Paris World Exhibition in 1867 (Andraschko and Schmidt, 1991; Schöbel, 2019). In 1877, stone saws and drills were added. In Germany, by 1867, the Roman-Germanic Central Museum had already cast and reproduced 2500 archaeological objects. In the same year, in Austria, there is evidence of 6 kg of Noric iron having been cast in 26 hours using a replica oven by Count Wurmbbrand. In Scandinavia, Frederik Sehested’s “Stone Age” house near Odense in Denmark marks the beginning of experimental archaeology in

1879, although this undertaking was not accompanied by any documentation or publication (Ahrens, 1990). The aim here was rather for an experience, an architectural structure, but not an experiment in the contemporary sense. On the occasion of the World Exhibition of 1893 in Chicago, the *Viking*, a replica of the Gokstad ship from Norway, crossed the Atlantic in 27 days, but regrettably only once and with inadequate documentation. Between 1844 and 1866, the Briton Edward Simpson, alias Flint Jack, produced flint tools using modern methods. These tools even made it into the British Museum. Later, however, he had to appear before a scientific tribunal for falsifying archaeological finds. In France, as early as the mid-19th century, there already existed an *archeologie d'expérience* which replicated stone objects in order to better understand the manufacturing processes. Jacques Boucher de Perthes, Eduard Lartet, or Henry Christy can be cited as the main proponents of this approach. The manufacturing techniques were not described; the reconstructions and replicated artifacts are, however, available for scrutiny.

In the late 19th century, prehistoric archaeology was in search of a disciplinary home within the academic world. Archaeology has always been a composite of many sciences and was still in search of its disciplinary belonging and a binding methodological approach. This was particularly true for experimental archaeology. Within the context of its institutional formation at the beginning of the 20th century, it was not consistently associated with the methods of Virchowian cultural anthropology, nor was it anchored in the natural sciences and in experiment, as was initiated, for instance, by R. R. Schmidt's Tübingen Institute of Prehistory in the 1920s (Schöbel, 2005), which led to building the first reconstructions in the open-air museum Unteruhldingen (Figure 13.1).

Counted among this is also the pragmatic, educational archaeology of the Weimar Republic, including, for example, Hans Hahne's 1918 construction of a Stone Age house in Rössen near



Figure 13.1 Silent film *Natur und Liebe* in the Pfahlbau Museum, Unteruhldingen 1926, premiered Ufa 1927, Berlin. Scientific advisors R. R. Schmidt, University of Tübingen, and Wilhelm Unverzagt, Berlin Museum. Source: Pfahlbaumuseum/G. Schöbel.

Halle/Saale. Such work was done in the spirit of folk studies and the folkloric settlement archaeology of Gustaf Kossinns in Berlin, which clearly did not correspond to any recognized discipline in Germany. The National Socialists misused archaeology in the 1930s by construing “living prehistory” as evidence of national superiority, and this resulted in the discreditation of experimental archaeology as a method of illegitimately reconstructing the past (Kandler, 2000; Schöbel, 2013; Sénécheau and Samida, 2015) (Figure 13.2). Although German “model workshops” and “publishers of teaching aids” continued to produce thousands of replicas and reconstructions for teaching purposes until the 1950s, this approach, albeit adeptly presented, was no longer called for in German-speaking archaeology after 1945. It was stigmatized as being a falsification of science. German archaeology, formerly leading in the sector of experimental archaeology in Europe, withdrew almost completely from experimental archaeology until the 1970s. It only permitted descriptions in the form of typologies, analogy, and deduction as its scientific approach. At the same time, the natural sciences in general had a hard time in archaeology. Above all, in the attempt to reconstruct experimentally, they were unjustly charged with being positivistic.

The impetus for a new take on the experimental approach in archaeology came—as it had in the 19th century—from the archaeological open-air museums of Scandinavia (Weiner, 1991; Andraschko and Schmidt, 1991; Schöbel, 2013). Hjerl Hede and Lejre (in Denmark) set new benchmarks for experimental archaeology, with Asparn (Austria), Butser Farm (UK), and Berlin–Düppel (Germany) joining them in the 1970s (Ahrens, 1990). The archaeological open-air museums carried and developed experimental archaeology, providing research venues



Figure 13.2 National Socialist exhibition *Lebendige Vorzeit* (Living Past), of the Reich's League for German Prehistory, Technical University of Berlin, 1937. Source: Pfahlbaumuseum/G. Schöbel.

(Figure 13.3) and experimental sites, and brought the field back to universities, scientific discourse, and teaching. In Europe, this is to be seen today in Vienna, Zurich, Tübingen, Hamburg, Leiden, Madrid, Exeter, and Dublin. Experimental archaeology's main research foci include textiles, metals, house construction, ceramics, agriculture, plants, the environment, stone, wood, cooking and nutrition, tar and charcoal, transport, bones and horn, pigments, salt, hunting, music, graves, glass, animals, leather, chalk, and living history—according to their frequency in European publications. An overview of current research can be found in the literature databanks compiled by Roland Paardekooper and Dirk Vorlauf. The *Yearbook of Experimental Archaeology* in Europe (1990–) and the *EXARC Journal* (2004–) provide regular updates on developments in the field.

Since the days of the early studies, the concept and methods of experimental archaeology have finally been established, yet debates over the definition and scope of the field continue. The question arises as to whether all archaeologists mean the same thing when, in good faith, they employ experimental archaeological methods. Today, apart from pure scientific empiricism, humanistic and combined scientific/humanistic approaches address the research questions of archaeology. Some apply analogy and methodologies drawn from the humanities, drawing peripherally on experimental archaeology and ethnology. The craft, reenactment, and living history scenes are used to support and illustrate the cases in point by examining and presenting them. Interpretation, however, remains the prerogative of the humanities—at least according to the traditional point of view (Lüning, 1991; Lammers-Keysers, 2005; Eggert and Samida, 2009). The second group concedes ground to the experiences and interpretive viewpoints of museum pedagogues, “archo-technicians,” and reenactors. It combines general and specific



Figure 13.3 *Steinzeit, das Experiment: Leben wie vor 5000 Jahren* (Stone Age, The Experiment: Life as it was 5000 Years Ago). Film production of SWR and the Pfahlbau Museum, Unteruhldingen. Source: Pfahlbaumuseum/G.Schöbel.

insights, making it difficult to competently test the findings in a scientific discourse. Their motto seems to be: “everything is experimental archaeology.” There are, however, different degrees of exactitude distinguishing AMATEURISM AND EXPERTISE (Reynolds, 1998; Schindler, 2018). And, finally, there are the experimental archaeologists (Coles, 1979; Fansa, 1990) who follow strict guidelines and seek to document and clearly define where they stand—whether at a pre-stage of the reconstruction, at the stage of conveying results, or during the actual experiment itself. This is the approach followed by the natural sciences, one which must finally prevail and which currently holds the greatest sway in central European research (Kelterborn, 1994; Schmidt, 2014; Mattieu, 2002; Outram, 2008; Weller, 2010; Schöbel, 2019). According to this approach, experience and experiment are to always be kept distinct from one another, as Callahan (1999) and Rasmussen (2007), for instance, and archaeologists in the 19th century already postulated. This is confronted by the rapidly developing movement to enliven history through the incorporation of elements like reenactment and living history. These are far more focused on the immediacy and durability of the experience on the event, and “lived” history. Reenactment and living history foster new insights without, however, providing new knowledge, and thus serve education and personal development. At the same time, these fields have disadvantages in relation to the verifiable scientific experiment, when, say, their methods are applied to historical processes. It is for this reason that experimental archaeology distinguishes the clearly defined experiment from the kinds of experiences brought into play by living history. The engagement with old things and events is common to all these avenues of inquiry; they do not, however, adopt the same methods. Only by adhering to set rules and through a possible discussion of the results will they become verifiable sciences.

Yet what differentiates scientific reconstruction from reconstruction that is not based on archaeological finds? Where does the experiment begin? And how can the results be conveyed in such a way that sensible statements can be made about prehistoric reality? From 1995 to 1999, Erret Callahan formulated a three-step model that drew on the work of Hans-Ole Hansen, John Coles, Peter Reynolds, and others. Callahan identified the “non-authentic game” as the first step, the “non-scientific experience” as the second, and finally the “experiment” as the completion of the process. Monitoring the processes, observation, and documentation were, in his view, of uttermost importance. As a method, reenactment belongs to the first two steps.

Peter Kelterborn (1991), supported most recently by Bill Schindler (2018), identified six steps within experimental archaeology, and this definition and philosophy were adopted by the international organization the Network of Experimental Archaeology in Europe (EXARC). The steps are: 1) emotional experiences; 2) the teaching and learning of archaeological techniques; 3) displays and demonstrations; 4) replications and reconstructions for research and museums; 5) the true experiment; and 6) the reporting of results. Reenactment encompasses steps 1–3, since reenactments are mostly undocumented or the results unpublished. Thus, the findings can neither be inter-subjectively followed nor tested and, as such, do not constitute part of scientific discourse.

EXARC (Weller, 2010; Schöbel, 2013) ascribes a three-part structure to experimental archaeology that follows the scientific tradition of the 19th century and the suppositions of John Coles (1973; 1979). Like the other approaches, it sees the classical experiment as the main part of experimental archaeology. The second part is the reconstruction, which is seen as a preparatory step. The third part, conveying the findings, delineates living history and reenactment as experiential and game modes, since they do not operate on the basis of archaeology’s results and its methodological *modus operandi*. A distinction can be made, however, contingent upon the qualifications of the respective participants. In instances in which reenactment or living history practitioners are found to work experimental-archaeologically and to document appropriately,

then their work might also be labeled experimental archaeology. Following the definition of Rasmussen (2007), Hansen (2014), and Schindler (2018), reenactment is conducted as experimental archaeology in its pursuit of experiment (controlled approach) and not only experience (contextual approach) in the social field.

European scholars differentiate between living history (Anderson, 1982), reenactment (Collingwood, 1993), LARP (live action role-play), experimental archaeology, histotainment, and historical theater (Hochbruck, 2009; Walz, 2010) (Figure 13.3). In other countries, other distinctions pertain. In the US, for instance, living history and reenactment are seen as one (Seiz, 2015; Gallup, 1999) and serve to educate both the public and their own practitioners in various branches of history. To this end, historical events are often minutely reconstructed using historical documents, props, contemporary music, speeches, photographs, and the findings of experimental archaeology. The older the reconstructed scene, the more the participants must rely on experimental archaeological results in order to portray the past with the highest degree of historical fidelity. After all, more ancient cultures are generally non-literate, and their reconstruction is dependent upon material objects, archaeological finds, and the interpretation thereof.

The historic antecedents of reenactment lie in antiquity. In 46 BC, Julius Caesar had an artificial lake constructed on the Campus Martius and staged a battle involving 22 ships and 6,000 participants. The passion plays of the Middle Ages, historic PAGEANTS, 18th-century reenactments in North America for the training of officers in military academies (Steinecke, 2007), and Stone Age people in lake dwellings of Switzerland around 1870 or Lake Constance in 1926 all perpetuated this tradition (Schöbel, 2011). Illustrative of this movement are history performances like the Roman soldiers in the reconstructed Saalburg Fort around 1922; the Landshut Wedding pageant, reenacted since 1903 with 2,000-odd participants; and the Roman games



Figure 13.4 Roman reenactment at the Unteruhldingen Museum, conducted by experimental archaeologist Markus Junkelmann in 2009. Source: Pfahlbaumuseum/E.J. Schultz-Friese.

with thousands of observers, put on in Murrhardt, Germany in 1925. The 1961 staging of the Battle of Bull Run from the American Civil War in Manassas, Virginia, with 2,500 participants and 55,000 observers, constitutes the beginnings of reenactment in the modern sense. First-person history portrayals are highly popular with the public and are a permanent feature of open-air museums in the US, as at Plimoth Plantation, which has referred to itself as a “living museum” since 1969, or at Colonial Pennsylvania Plantation (Anderson, 1982).

Most scholars regard the kinds of performative approaches adopted by living history and reenactment as eminently well suited to reflecting the insights of the participants and conveying information to the public (Figure 13.4). Such “time travel” is a reliable tool for conveying history and generating rudimentary historical insights. However, with regards to the AUTHENTICITY debate, the methods and insights of experimental archaeology always ought to be considered when staging historical events. Doing so will help ensure the scientificity of the findings, avoid alienating the historic material, and avoid spectacles with dubious historic content.

*Translated by Vanessa Agnew*

### **Further reading**

Agnew, V., 2018; Coles, J. M., 1973; Schindler, B., 2018; Schöbel, G., 2017; Sénécheau, M., and Samida, S., 2015; Sibum, O., 2009; Walz, M., 2010.