



■ Fig. 1 The archaeological park of the Forcello Bagnolo San Vito (Mantova)

From archeological evidence to experimental reconstruction and back

The experience of the Archaeological Park of Forcello of Bagnolo San Vito (Mantova, Italy)*

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The project of the Archaeological Park at the Forcello of Bagnolo San Vito (Mantova) (Fig. 1) stemmed from the need to safeguard and exploit to its best an archaeological area, where for 25 years, the excavation of an important Etruscan city has been in progress. From its beginning it involved on one hand the academic world (Università degli Studi di Milano) and on the other hand experimental archaeologists, above all Roberto Deriu, who constructed two pottery kilns.

Before explaining the results of this collaboration, a short introduction to the Archaeological Park will follow.

The discovery of the Etruscan site goes back to the sixties and seventies of the 20th century, when, from the first surveys, the relevance of the site was confirmed by prof. Raffaele C. de Marinis who recognised Forcello as the first Etruscan settlement discovered north of the Po River (*de Marinis 1983*).

The identification came from analysis of the material cul-

ture, particularly the so called “Etruscan-Padan” pottery, but above all from inscriptions in the Etruscan alphabet on the vases (Fig. 2).

The excavations, from 1981 to date, directed by professor de Marinis, have brought to light, year after year, just a small portion of this settlement, but with a long stratigraphic sequence, defined in eight main phases. The city, founded around the middle of the 6th century, lasted until the beginning of the 4th century BC (*Casini, de Marinis 2005: 46-53*).

To preserve at least a part of the settlement from insistent and destructive agricultural work and in order to divulge the scientific results obtained from the research, the Bagnolo Council purchased 8000 square meters of the archaeological area, including the 600 square meters where the excavations are being carried out by the Università degli Studi di Milano. So the Council, with the collaboration of the Chair of Pre and Protohistory of the University of Milan, had defined a project, signed by architect Stefano Gorni Silvestrini, for enhancing the

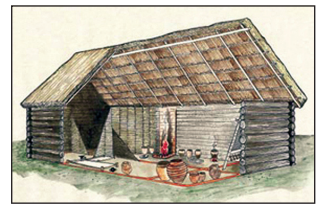
area and equipping it with receptive buildings.

The aim of the project, carried out also with the contribution of Lombardy Region and European Union, was to give the discoveries made at Forcello the wealth and importance that they already have in the scientific field and to give it a useful way of being popularised and put it to good didactic service.

The distinctive features of the area and the presence of a complex archaeological deposit suggested buildings on superficial foundations and suspended above the ground. This feature will also allow the buildings to be moved in future if necessary.

The structures, of wood and steel, have natural colours, that place them in continuity with the landscape, and their orientation reflects the one that the Etruscan settlement had, all the buildings are situated along a longitudinal axis NW-SE.

The architecture of the main buildings is thought to evoke the construction technique founded in the Etruscan city (blockbau and wattle-and-daub) (Fig. 4).



■ Fig. 4 Didactic reconstruction of an Etruscan house (R. Rachini)



■ Fig. 5 Laboratory activity on food production (for schools)

▼ Fig. 2 Experimental pot with inscription in Etruscan alphabet





■ Fig. 3 Excavation of the Etruscan site of the Forcello

A rich didactic display in the park is required because Forcello houses were built using perishable materials (such as wood, straw and clay) and the remains of these dwellings could therefore hardly be “read” and interpreted by the general public, as only traces of the foundations (e.g. post-holes, small gullies) are still preserved.

A visit to the Forcello Archaeological Park is guided by didactic panels, with the aid of which visitors can approach the history of Padan Etruria and, in particular, of the Forcello settlement.

For schools, of every class and level, there are laboratory activities on various themes of craftsmanship at the time of the Etruscans like weaving and moulding clay, or food production and on the profession of an archaeologist (Fig. 5).

There is also a multimedia hall, where the visitors can ex-

plore by themselves specific topics, watch videos or cartoons or using the web-based training to verify by playing with the information learned during the visit (Fig. 18).

Experimental archaeology represents a good practice to join research and popularisation. At Forcello, in particular, where the excavations in the settlement are still in progress, the experimental research goes side by side with the academic one, enriching, confirming or debating the hypotheses which come out of the excavation records.

Designing the Park, the first idea was to construct a house, but the economic aspect and the problems concerning the underlying archaeological deposit made it preferable to concentrate efforts on reconstructing craftsmanship activities, that can create awareness in the public of archaeological topics and a



■ Fig. 6 Vertical white fir loom created on the basis of archaeological data by Tania Lorandi (2006)

guide to a better understanding of the ancient world.

Tania Lorandi constructed a vertical white fir loom, created on the basis of archaeological proof (Fig. 6). In a room of a big house (phase F 510-500 BC – *Casini, Longhi, Rapi 2005: 95*), where carbonised wood was found, probably part of a loom, some iron nails and many clay loom weights. This artefact is used in the workshop “Yarns from the past” where adults and children can try threading and weaving.

Another handcrafts activity well represented at Forcello, from the huge amount of local-made ware, is pottery production.

Pottery production

In collaboration with Gesti Ritrovati, Roberto Deriu constructed two pottery kilns. The excavations in the site has not yet located a specific furnaces area so the reconstruction is

based on the evidence from the contemporary Marzabotto (Bologna), where in 1992-93 an excavation was carried out by the University of Bologna (Fig. 7). The kilns are used for experimental research on Etruscan-Padan type pottery, and the first results are expound in Deriu’s specialisation thesis, discussed at Milan University under the supervision of prof. de Marinis (see also EuroREA/6 – *Deriu 2009: 39-44*). In 2007 the didactic operators attended a specific course on furnaces to help them organise demonstrations for public. The demonstrations are often made in collaboration with Archeologia del Gusto (Taste Archaeology), a research group which prepares Etruscan meals, with the aim of placing the ancient object in their original habitat and creating evocative surroundings that involves the public.

Research and popularisation, missions of the Park, found



■ Fig. 7 View of the Etruscan kilns discovered in Marzabotto (Bologna) in 1992/93



■ Fig. 9 A fragment of kiln daub, very important for comparison with archaeological evidence



■ Fig. 11 Clay preparation for shaping and decorating vases



■ Fig. 14 Pot being removed during ‘hot’ opening of the big kiln (6th firing test, July 2009)



■ **Fig. 8** Reconstruction of pottery firing activity (3rd firing test – March 2008)



■ **Fig. 17** Preparation of the clay

in experimental archaeology an important tool, that on one hand enriched research with new experimental data and on the other involved the general public, making it aware of the aim and the results of the research itself (Fig. 3).

The importance given at Forcello Archaeological Park to the reconstruction of pottery firing activity (Fig. 8), is based not only on the technology aspects, like clarifying gaps in the production cycle (Deriu 2008: 7-15), but also on the cultural recovery, with the aim of re-discovering the human factor in the production of pottery for every day use, like eating and drinking, cooking and conserving food. Today, 2500 years later, it is still possible to relive this with experimental archaeology.

The wide diffusion of pottery in the ancient inhabited context is strictly connected with its unique role in fulfilling daily needs.

Research in Forcello clearly shows the pottery role as a preferential indicator in the archaeological context. In this site, for example, the inscriptions on local produced pottery (de Marinis 2005: 57-76) allowed the identification of the settlement as Etruscan. The imported Attic pottery, on the other hand, dated the archaeological phases (de Marinis 2005: 125-138). The

long lasting life of this kind of artefacts depends on the consistency that the clay reaches after the firing process. So, even if indirectly, it is the firing process that has allowed the interpretation of this cultural context.

Experiments

Considering this matter, the eminence of pottery in the archaeological record comes from the leading role of firing pottery in ancient society. To experimentally reconstruct the firing activity is the most logical way to represent, both physically and anthropologically, the connection between the ancient production activities and modern archaeological research. If we trace again the firing strategy it would be possible to clarify the human behaviour that lies beneath the objects creation, and the following functional control, made by using the artifact, can clarify the process that starts with its creation to its use and degradation. This last phase is particularly meaningful because it may allow interesting comparisons with the archaeological evidence, helping the understanding of the post-depositional process (Fig. 9).

To recognise the human factor, hidden beneath the manufacture and use of the object, represents, however, the real cultural heritage to research and preserve, is the final aim

of Experimental Archaeology. While the archaeological evidence is first, this important tool can also lead to knowledge.

The research carried out in Forcello Archaeological Park, started with the construction and testing of two experimental kilns, that concentrated on clarifying the production techniques of the Etruscan-Padan pottery, which is a fundamental production in Etruscan society connected with food preparation, daily consumption and storage. To date 8 experimental firing events have taken place, 2 with the purpose of consolidating the kilns, 4 for fine-ware production in the small kiln (Fig. 10), and 2 for firing cooking and food containers in the bigger kiln (Fig. 16).

The working process, used in constructing this ancient context, has utilised resources and technologies comparable with the ones used by the Etruscan

craftsmen: the clays (Fig. 11) selected for shaping and decorating vases, have a mineral ferrous component typical of the Padan plain, the kilns have been built on the plans of originals found in the contemporary Padan-Etruscan site of Marzabotto.

The use of different firing techniques (oxidizing and reducing) has shown a good conformity in the colour range between the replicas and the original Etruscan vases (Fig. 12).

Also accidental errors, documented during the experimental process, aided the definition of firing techniques and detected how the vases were stacked in the firing chamber, which is an action without direct archaeological evidence (Deriu 2008).

Concerning stacking, the experimentation has confirmed the necessity use of stilts for



■ **Fig. 12** Original Etruscan vases found during excavation of the Etruscan site of the Forcello (Mantova) (from de Marinis - Rapi 2005)



■ **Fig. 10** A firing experiences during "Museum by night" at Forcello (July 2007)



■ **Fig. 13** Use of stilts in the small kiln (5th firing test, May 2009)



■ **Fig. 15** Precedent and similar firing experiences: October 2007, 19 firing test on a celtic kiln (II sec.a. C.). This kiln was built in Faenza (Ra) in November 2004 and used for 21 firing tests



■ **Fig. 16** The big kiln opened after a firing test (April 2008)

the ware (**Fig. 13**): clay supports that can improve the hot gas passage in the firing chamber (Deriu, Zamboni 2008: 178-179; see also Deriu 2009 in EuroREA/6: 42).

In relation to firing techniques, the relevance of the "hot" opening of the kiln was made evident, used also in the last public experimental demonstration at Forcello (**Fig. 14**). This use, distinguished by extracting the artifacts before the complete cooling of the structure, sets out to prove the continuity between one firing event and the following, and can be meaningful of the *modus operandi*, typical of specialised ateliers.

This kind of extraction, which is done in any case at lower temperature to avoid dangerous thermal shock that can damage the pottery and the kiln itself, needs more experience in the craftsman, compared to "cold" opening (Deriu 2008: 84-115). This experience I acquired through former firing experiments done on similar kilns. This specialisation reflects a high professional level shown by the complexity of the structure and the technical details revealed archaeologically and experimentally in the two kilns (Deriu 2008: 116-140). The protocol of the kilns use should correspond to optimised human and economic resources (Deriu 2008: 568). The "hot" opening is based on the hypothesis that the firing events were closer and consecutive, in order to use the heat still preserved in the kiln for making the next firing process pre-heating phase faster, saving also a certain amount of wood. Another advantage for "hot" opening is to better involve the public in the entire production cycle, because this use allows to operate for two consecutive days, and is more involving than opening when the furnace cooling has ended.

After extraction a functional check of the artefacts takes place. This is a particularly

delicate step in which the public can be involved. The objects are immersed and washed in water to verify the success of the firing process that transforms the fragile clay to solid ware. This washing test is also useful to increase the cooling process and to clean the vases from residual ashes. The next step is to use them with drink or food. The last firing event at Forcello was completed with wine and mead tasting in the drinking vessels just taken out of the kiln.

Some of these artefacts will be used in future experimental events to test the duration of the object in relation to their usage.

Work team

The tests carried on at Forcello, compared to other works in different specialised ateliers (Deriu 2008), have allowed some considerations on the human component involved in the artisan manufacture, already highly specialised considering the archaeological evidence (Casini 2005: 247) (**Fig. 15**).

Data on demographic density and the use frequency of the furnaces in the original contexts are unknown, but aspects like the work organisation and subdivision, can however be recovered through experimentation by defining the "minimum work team", that is the basic *équipe* needed to carry out a specific production. The first step is to identify the different production phases. In the Forcello case this phases, sorted out

by typo-technological analysis of the local pottery, are 4: finding and preparation of the clay, moulding, decoration, firing.

Looking at the skill subdivision in contemporary Greek productions, which is better studied, it is possible to imagine the presence of at least one specialist and one or more apprentices for each production phase, but this model is liable to many variations depending on the peculiarity of each atelier. For example, the extractive activity and the preparation of the raw material could also be done by part of the group of manufactures. The manufacturing phase is the best known from the scenes depicted on Attic pottery, where we can see the specialists and the apprentices. Concerning decoration, in the Forcello site the use of slip is attested (Deriu 2009: 40-41), partially waterproofing the pottery used for eating or drinking. Considering the complexity of the preparation of this kind of slip (Deriu 2009: 40-41) it is easy to suppose that the decorator/painter figure was separate from the manufacturer, as witnessed in the Greek world, and had one or more apprentices himself.

The last production phase, the firing one, remains the most controversial, and at the same time the most critical for the final characteristics, consistency and colour, of the artifact.

It is the least studied in regard both to the kiln building and use, and to the fire con-

Composition of 'Minimum work team'

Extractive activity and preparation of the raw material:

Roberto Deriu^[1], Gino Geminiani^[2]

Manufacturing: Gino Geminiani

Decoration: Roberto Deriu

Kilns construction: Roberto Deriu, Carlo Piancastelli^[3]

Direction of firing actions: Roberto Deriu

Assistance during firing actions: Alberto Rossi^[4], Chiara Gradella^[5], Manuela Amadasi^[6]

trol techniques (Deriu 2008: 7-15). This gap is due to the progressive disappearance of firing methods with solid fuel, replaced since the last century by gas or electric furnaces. In kilns with solid fuel, the presence of the fireman is essential during all the firing process, and this kind of kilns needs one or more operators to guarantee their correct use. It is also worth considering that vertical kilns need specialised manpower to be constructed, repaired and used (Deriu 2008: 37-52).

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Summary

Vom archäologischen Befund über die experimentelle Rekonstruktion und zurück

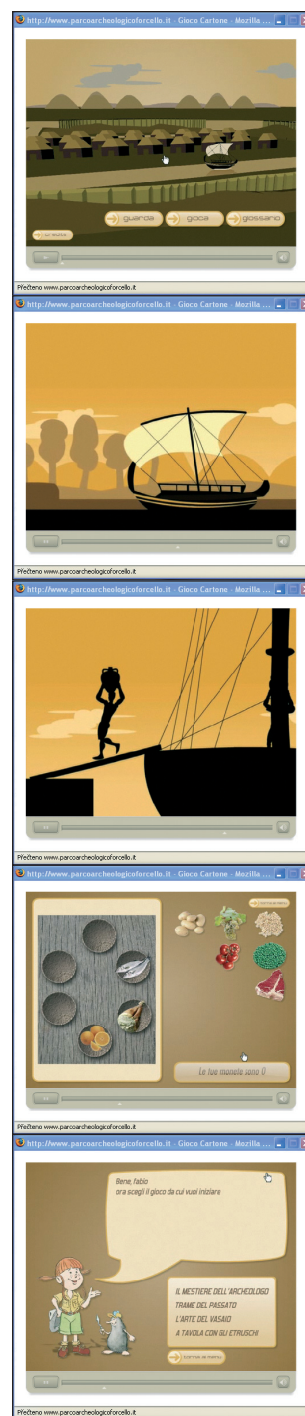
Das Ziel dieses Artikels ist es, die Ergebnisse archäologischer und pädagogischer Aktivitäten des Archäologischen Parks von Forcello bei Bagnolo San Vito (Mantua, Italien) vorzustellen, die dort seit seiner Eröffnung im Jahre 2006 durchgeführt wurden. Die Pläne, einen Archäologischen Park in Forcello zu errichten, wurden entwickelt, um eine seit 25 Jahren untersuchte etruskische Grenzstadt dauerhaft zu sichern und für die Öffentlichkeit zugänglich zu machen. Von Beginn an wurde dieses Projekt getragen durch die Zusammenarbeit von Wissenschaftlern der Universität Mailand, von Fachleuten aus der Denkmalpflege und von Experimentalarchäologen. Die Ausgrabungen, die seit 1981 unter der Leitung von Prof. de Marinis (Università degli Studi di Milano) durchgeführt werden, haben bisher nur einen kleinen Teil dieser großen Siedlung freilegen können. Trotzdem dürften die Ergebnisse repräsentativ für die gesamte stratigraphische Sequenz sein, die insgesamt acht Siedlungsphasen aufweist, welche von 6. bis in das 4. Jh. v. Chr. datieren. Die Besonderheiten sowie die Bedeutung der Entdeckungen werden durch große, niedergebrannte Hausbefunde, griechische Keramik und importierte Amphoren gekennzeichnet. Diese Befunde und Funde lassen den Siedlungsplatz von Forcello besonders geeignet erscheinen, um ihn öffentlich

zugänglich zu machen. Die Experimentelle Archäologie, vor allem die Rekonstruktion von zwei Töpferöfen, ist dabei von wesentlicher Bedeutung für die Ansprache einer größeren Öffentlichkeit.

De la preuve archéologique à la reconstitution expérimentale, et retour

Ce article présente les résultats des activités archéologiques et pédagogiques du parc de Forcello, près de Bagnolo San Vito (Province de Mantoue, Italie) depuis son ouverture en 2006. La décision de création de cet équipement reposait sur la volonté de préserver le site tout en rendant accessible au public une exceptionnelle cité frontalière étrusque fouillée depuis 25 ans. Dès ses débuts, ce projet a été mené en partenariat avec les institutions académiques de l'université de Milan, des spécialistes du patrimoine et des archéologues spécialistes de l'expérimentation. Les fouilles, menées depuis 1981 sous la direction du professeur de Marinis (Università degli Studi di Milano), n'ont pour l'instant permis d'apporter des éclairages que sur une infime partie de cet immense site. Cependant, les résultats donnent déjà une très bonne représentation de la stratigraphie du site qui comprend huit phases de développement du VIe au IVe siècles avant J.-C. La richesse et l'importance des découvertes repose sur de nombreuses habitations incendiées, des poteries grecques et des amphores d'importation. Leur intérêt justifiait entièrement une ouverture au grand public. L'archéologie expérimentale et plus particulièrement la reconstitution de deux fours de potier a prouvé toute sa valeur dans l'élargissement des public.

* This article was translated by Lara Comis and Matteo Pilati



■ Fig. 18 Some slide from the cartoon and the game (web based training)

- 1 Roberto Deriu: specialisation Degree in Prehistory and Protohistory at the University of Milan; Master of Art at the Art Institute for Ceramics in Faenza (pottery decoration); sculptor; pre-experimental and experimental continuative experience (2003 – 2008) in construction and use of pottery kilns construction with solid fuel (17 different kinds of kilns / 46 firing tests).
- 2 Gino Geminiani: Master of Art at the Art Institute for Ceramics in Faenza (manufacturer) (formative experience by Gestì Ritrovati).
- 3 Carlo Piancastelli: ceramic chemist; Master of Art at the Art Institute for Ceramics in Faenza (pottery technology); sculptor; experimental experience in construction and use of pottery kilns construction with solid fuel (formative experience by Gestì Ritrovati).
- 4 Alberto Rossi: final year student in Conservation of Cultural Heritage; experimental experience in construction and use of pottery kilns construction with solid fuel (formative experience by Gestì Ritrovati).
- 5 Chiara Gradella: archeologist and didactic operator at Forcello Archeological Park; Formative stage (2007) about Etruscan-Padan kilns (formative experience by Gestì Ritrovati).
- 6 Manuela Amadasi: archeologist and didactic operator at Forcello Archeological Park; Formative stage (2007) about Etruscan-Padan kilns (formative experience by Gestì Ritrovati).