

Pietrabuona (Tuscany, Italy).

Building archaeology of a border settlement between Lucca and Florence

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Abstract: The Pietrabuona castle was built by Pietro II, Bishop of Lucca (896-933 AD) on the top of a hill around the Valleriana Valley. After the fail of the first “incastellamento”, a new castle was built in the 12th century, when the new stable demographic consistency allowed the success of the settlement during the Middle and the Modern Ages. In the 14th century Pietrabuona was conquered by Pisa, but brought soon under the Florentine control.

The survey campaign (using a combination of a laser scanner and a total station) was carried out by a working group of architects, archaeologists, historians, landscapists and geologists. The synergy of all the skills provided a huge amount of information about the urban and architectural heritage, through the implementation of new protocols. The laser scanning equipment allowed the survey of all the buildings in a few days and a wide range of output that became an essential tool for stratigraphic analysis. In this way it has been possible to identify the buildings' relative chronology and to analyze the wall building techniques, the architectural elements and the building types. We were also able to define and develop measure-chronology curves, always based on good architectural survey (also in cases of narrow streets, inaccessibility). All these data permitted to know the transformations of the settlement, the technical knowledge, the introduction of new different buildings of the power: from Romanesque Church of S. Matteo to the contemporary Church, and from the Medieval castle to the modern Salviati (?) “domus”.

In conclusion, the archaeological analyses, thanks to good surveys, allowed to record all the Pietrabuona's architectures and to reconstruct the local economy, the social differences and the artistic-architectural influences, due to the complex political events.

Keywords: Pietrabuona, Building Archaeology, Laserscan, Heritage.

Introduction

In northern Tuscany, the slopes of the Apennines astride the regions of Tuscany and Emilia-Romagna exhibit a “comb-like” orographic pattern. The parts of land enclosed between two parallel ridges quite often have their own identity, so that, despite their complex relations with the neighboring areas, they may be independently addressed. Usually, because such areas have always hosted settlements, there are quite a few inhabited centers at the top of the smaller ridges, connected to each other by roads, either on the ridge or mid-slope, with a larger settlement at the bottom of the valley, with men and goods passing through, near some crossing on the main stream.

Valleriana is a case in point (Fig. 1): runs through by the torrent Pescia di Pescia, it has three valley subsystems: Val di Torbola, Valle Avellanita and Valle Arriana, run through by the torrent Torbola, the torrent

Pescia di Vellano, and the torrent Pesca di Pontito, respectively. The settlements up the mountains consist of ten fortified hamlets dating back to the 10th and 11th century, mainly erected for economic and military defense. In particular, because of the specific geographic location of Valleriana, bordering on the possessions of Lucca and Pisa on one side, and on the possessions of Pistoia and Florence on the other side, here the settlements, under the control of either ruler, always played a key strategic role. (G.L.)

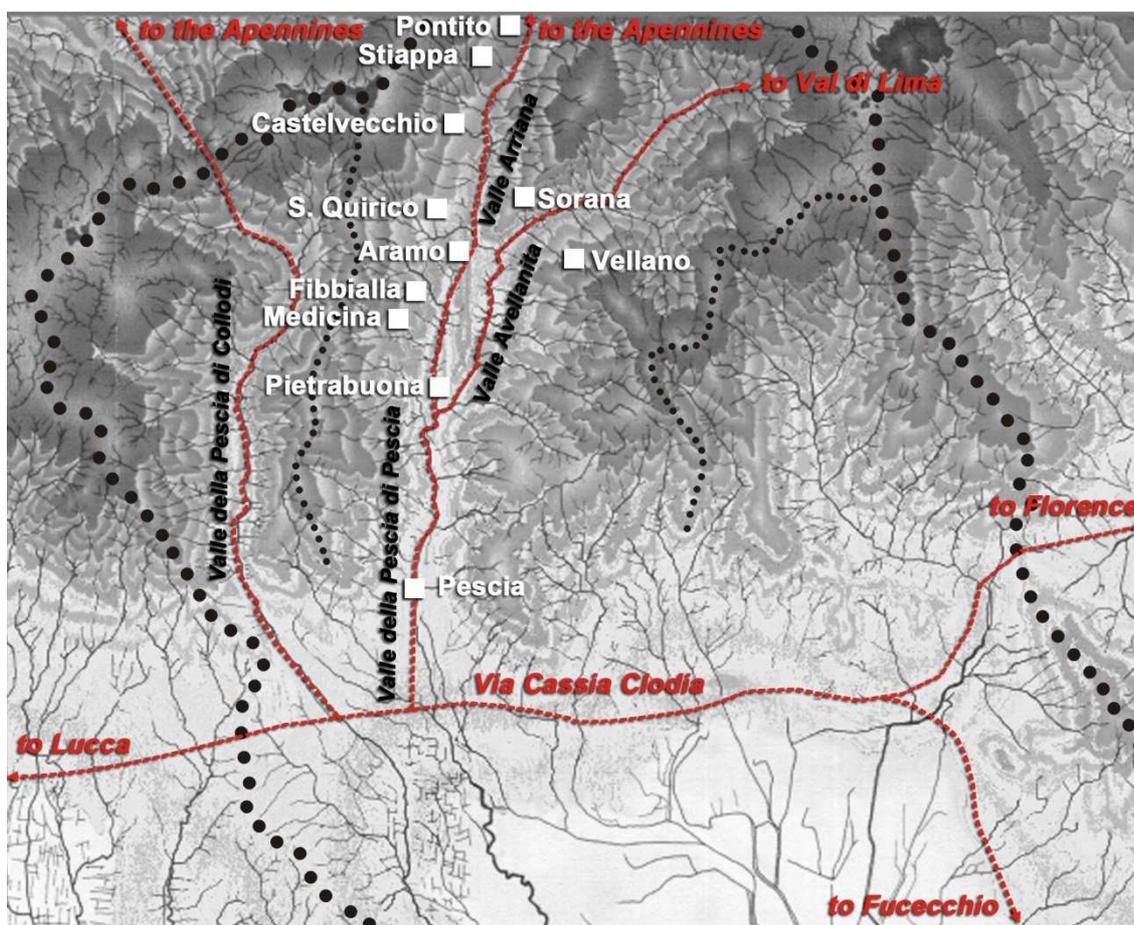


Fig. 1 – The Valleriana settlements

The integrated survey campaign

For the last few years, the smaller centers of the so-called “Svizzera Pesciatina” have been investigated by a working group consisting of surveyor architects, landscapists, medieval archaeologists, geologists, historians and art historians. Because of the cross-disciplinary character of the team and the pooling together of different areas of study, we could understand how such settlements changed over the centuries, in terms of urban plans and buildings. The survey of Pietrabuona (Fig. 2), the third centre investigated after Aramo and Sorana, belongs to this line of investigation.



Fig. 2 – The Pietrabuona castle



Fig. 3 – Screenshots by points cloud model: axonometric view , plant and elevation

The archival sources, the metrological surveys that followed the integrated survey campaign (using a combination of a Faro Photon 120 laser scanner and a Leica TS02 total station, which was used to lay out a topographic grid prior to scan logging), under the coordination of Prof. Alessandro Merlo, which collected a huge amount of information that thoroughly documented the architectural and urban heritage of the castle, and the stratigraphic surveys of the walls provided information about the structure of the primeval settlement and the changes it went through over the centuries (Fig. 3 and 4).

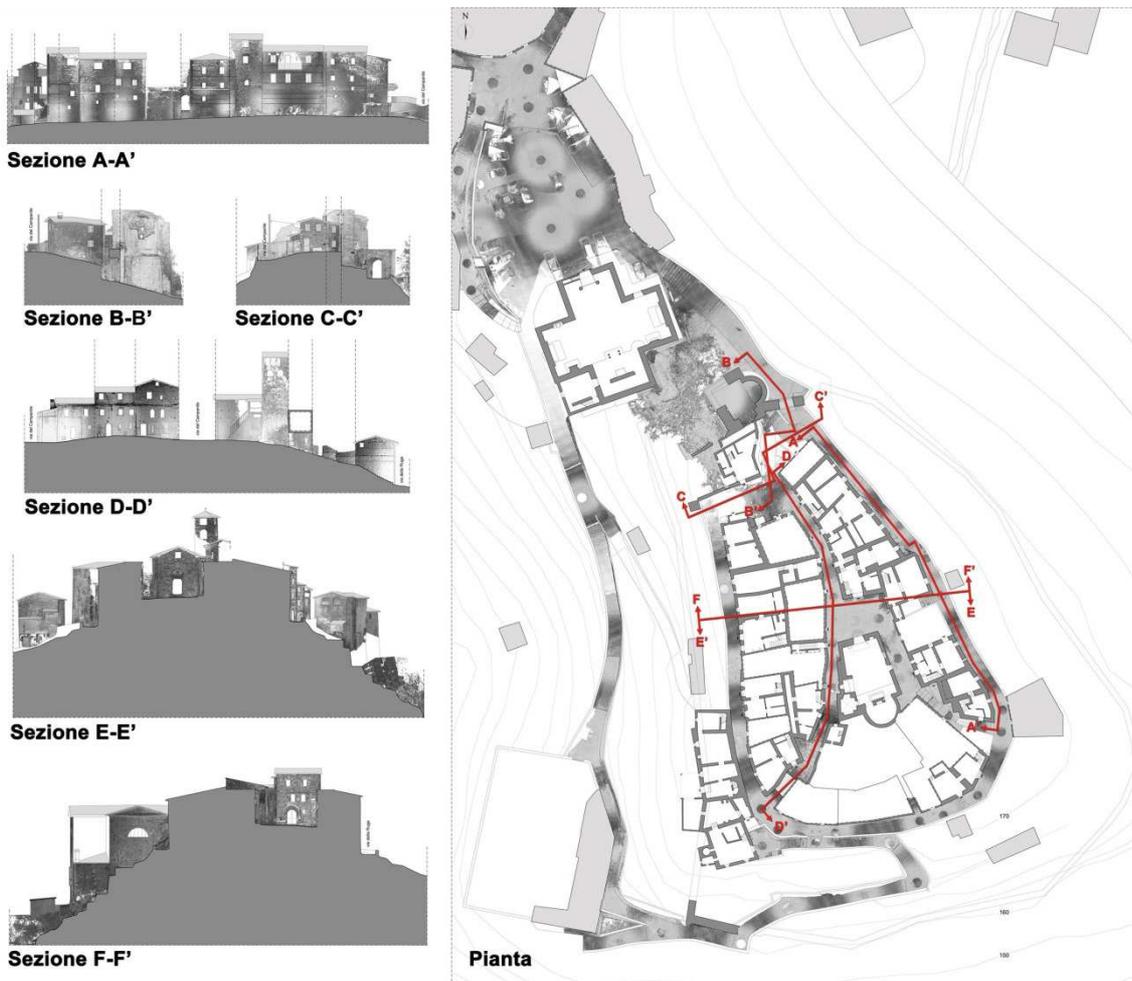


Fig. 4 – Integrated survey: plant and elevations (scale 1:1.000).

The survey is the starting point for the scientific study of each architecture, and especially in the case of complex organisms, such as urban settlements.

The Pietrabuona settlement survey was operated with multiple, integrated tools and technologies; the following human traces interpretation – from the landscape to the town and to the architecture – allowed to build the reconstruction of this area evolution, with a rich use of digital technologies based on the digital modeling, this gave the opportunity to access directly the historical process in townscape creation and environment transformation. Laserscan survey, topographical and traditional survey, archaeological and geological investigation, the Building Archaeology's study, the landscape and the territorial analysis and the photographic campaigns, all of this, built together, placed in an integrated system, produced the digital model of this town, oriented to give back to the occasional user, to the technician and to the researcher a high quality access to information, were the model becomes the vehicle to communicate the main architectural and urban characteristics together with the rules which guided the development. And all is done with no compromises about the metrical accuracy. In this way, the digital three dimensional model becomes the main tool in cataloguing and organizing the elements of the town, making possible to access single and general elements as an evolved tool working side by side to traditional processes.

The laser scanning equipment allowed the survey of all the buildings in a few days and a wide range of output that became an essential tool for stratigraphic analysis. (G.L.)

The archaeological data

The Pietrabuona castle is one of the rare cases of “incastellamento” in Tuscany in the 10th century, only documented by written sources. The absence of archeological excavations doesn’t allow material data for this first settlement. Thanks to a group of «libelli» we know that in 914 AD, Pietro II, Bishop of Lucca, in substance sold eight houses in Pietrabuona Castle to a group of the Diocesis’ lower aristocracy. In this way the Bishop bound to himself rural aristocracy and finally Aristocracy made his social climbing.

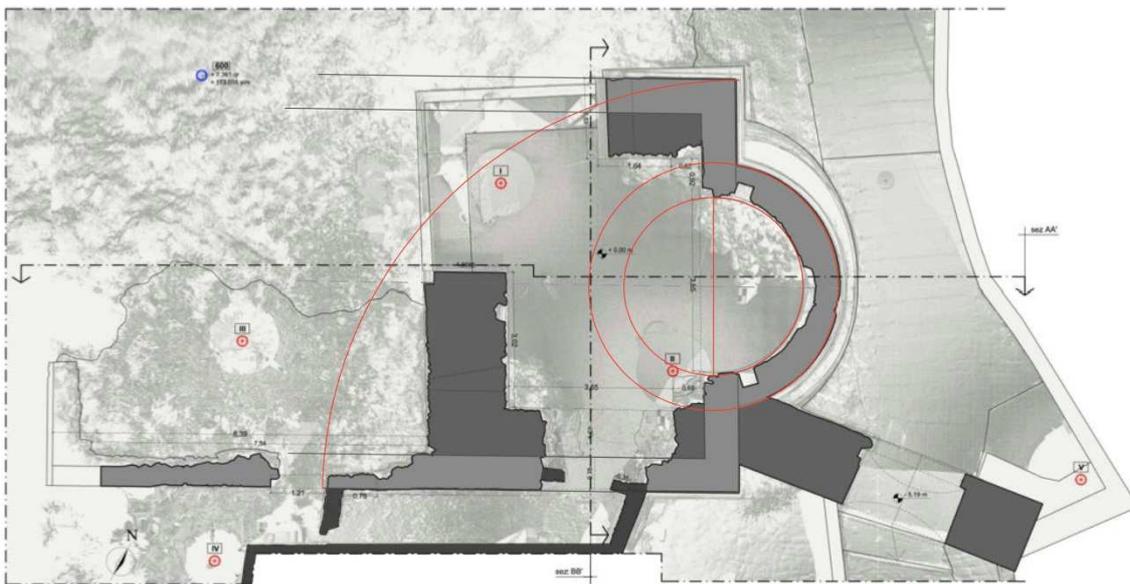


Fig. 5 – S. Matteo church (light gray). In the 14th century the new tower of the castle, the «Rocca», was built on the collapsed building (dark grey). (reworking of Gaia Lavoratti and Andrea Aliperta’s elaboration)

After few decades, Pietro II sold the ancient Pietrabuona Castle, by now called «colle et sterpeto», hill and scrub-land. Maybe some economic factors and the competition of other near settlements were the causes of the fail of “incastellamento” as well as the settlement’s depopulation (BARSOCCHINI 1971, V.III, pp. 345, 386, 520, 608). After two centuries a new castle was built in Pietrabuona, when the new stable demographic consistency allowed the success of the settlement during the Middle and the Modern Ages.

The most important architectonic evidence of Pietrabuona rebirth is the S. Matteo church (Fig. 5). This church was built in squared stones of sandstone, produced by skilled workers, who adopted the architectonic language of the Pistoia’s area in decoration, apse form and crown.

The S. Matteo construction is connected to the circulation of skilled workers from the Antelmi’s Valley to Lucca’s country (maybe employed in S. Lorenzo al Cerreto and in S. Margherita of Pescia), and it is an example of the introduction of squared stones in the 12th century.

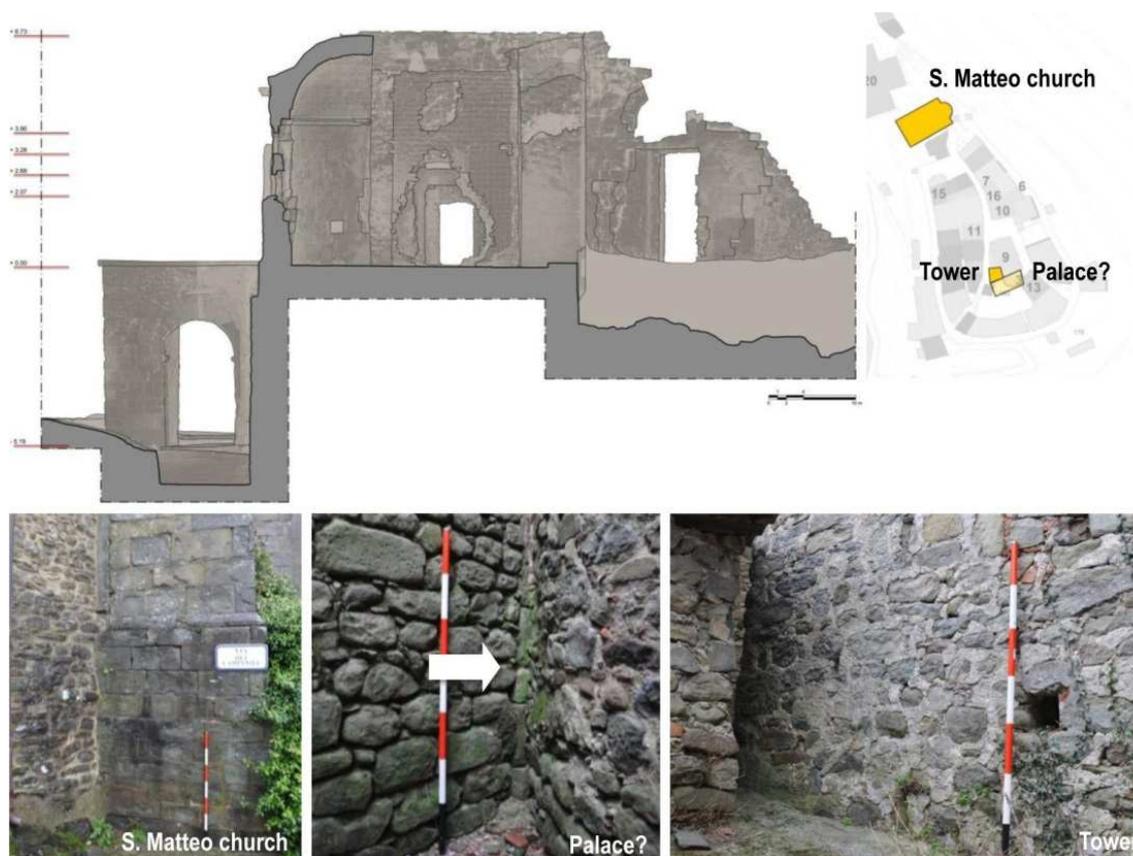


Fig. 6 – The first incastellamento of Pietrabuona: S. Matteo church (Section elaborated by Gaia Lavoratti and Andrea Aliperta), Palace (?) and Tower.

The hall of the church measures ca. 9.30 meters by more of 14.25 meters. The apse, less than a perfect half-circumference, has a diameter of about 5,57 meters. There are still preserved two Romanesque portals on the southern wall, a little door near the apse and a bigger door in the western part. They have monolithic architraves set on sculpted corbels. Both the portals are crowned by arches set on molding corbels, which are not directly put on architraves but on a squared stone. The principal door has also a hood molding. In the southern wall there are also two small windows with monolithic jambs and arches and molded corbels and sills. Under the eaves, the building doesn't have hanging arches, known in "Lombard" buildings as the church of the near Lignana castle, but it has molded diatones as, for example, the close church of S. Lorenzo al Cerreto.

Probably in the same years, also a new tower and maybe a palace were built in the upper part of the settlement. Hypothetically, we have identified the «palatium», in a corner between the 14th century hospital and the apse of S. Michele church, and the tower, at the bottom of the bell tower. The tower was built by skilled workers in coarse squared stones linked by mortar of lime; this construction technique is widely common in the civil buildings of the upper class, dated in the 12th and 13th century (Fig. 6).



Fig. 7 – Medieval house belonging to lower armed clientele.

Civil buildings of the 12th and the 13th century in Pietrabuona testify also an important social differentiation. In the southeastern part of the settlement there are two houses surely belonging to lower armed clientele (Fig. 7). The best preserved one has a big pentagonal plan, high wall and rare and small openings. There are some small windows in the upper part, built with monolithic stones, and the door is on the upstream side.

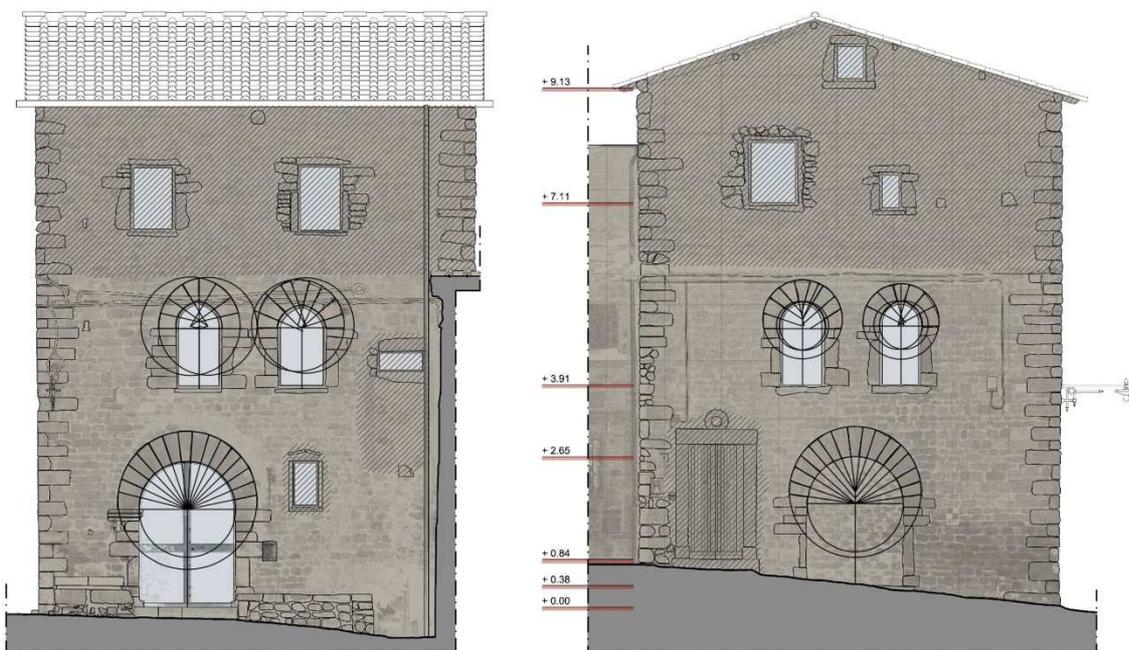


Fig. 8 – Commune's house. (reworking of Gaia Lavoratti and Pablo Rodriguez Navarro's elaborations)

Lower aristocracy, linked to the Lords, could find his own social promotion in seigniorial organization of violence and with this kind of houses could express his own status and his military and economic potential. In the settlement there are many other buildings belonging to another aristocratic class, lower than the previous one, and these houses have smaller internal surfaces and lower walls. Skilled workers built them

with mortar of lime, hand-hewn stones and squared stones used in openings and in corners. Doors were opened on principal roads and they could have lintels or arches.

After the fail of the first "incastellamento", the buildings testify the rising of the village, now densely populated and characterized by an important social differentiation. In this period, nearby the aristocratic buildings, we must suppose wooden houses belonging to the lower class and not yet preserved.

It's not surprising that in the 13th century Pietrabuona, as Buggiano, Vellano and Pescia, tried to disengage itself from Lucca with the Imperial support, and, in the first part of the 14th century, started to construct a new building for the rural Commune's offices (Fig. 8).

The new building is composed by the "house of Commune" and the tower, which represent two of usual architectonic elements of the communal power places in Tuscany. The first has a quadrangular plan with sides measuring ca. 11 meters. A loggia, formed by two big arcades on the southern and western wall of the building, occupies half part of the lower floor. The upper floor is lighted by four windows with arches. The tower, whose eastern side was built on a preexisting building, has some small windows with architraves on the upper floors.

Analyzing the arches we can note that not only one stonecutter worked to the building's construction. The «magister» worked on the building's principal side, in front of the church. We can note his work in the ground floor portal, where the perfect semicircular arch, built on two aligned centers to the central axis, has one molding corbel on the left and where all the voussoirs are cut following the radii of lower circumference.

The «magister»'s work is clear in the left window on the first floor, where he cut an equilateral pointed arch with four centers and joint at the apex, following the radii of two lower arches for voussoirs.

As shown in figure 8, the other architectonic elements are less accurate and testify the work of other stonecutters, maybe apprentices or less specialized workers (local stonecutters cooperating with foreigner ones?).

Meanwhile, before the first middle of the 14th century, the settlement radically changed, probably under the government of Castruccio Castracani in Lucca and during the war between Lucca and Florence. A new tower was built on the ancient church, now becoming the "Rocca" (Fig. 5) and the settlement was encircled by new walls (AALu, Libri antichi, n.66, c.52, 22 novembre 1354). Probably in the same years a new oratory was built in front of the Commune's Palace and, because of the destruction of the old church, in the 14th century it gradually inherited all the ecclesiastical offices and rights. The portal of the new church is like the minor one of the old church, but the wall technique uses less expensive hewn stones (Fig. 9). We don't know the exact date of its construction: probably it was built in the 14th century, in the same building plan that included the new walls with the Rocca, at the entrance of the settlement, and maybe the Commune's Palace. In the second part of the 14th century Pietrabuona was definitively conquered by Florence. The architectural elements testify the florentine presence and the circulation of new trends in cutting stone, construction and living. The «longa manus» of Florence is testified by two buildings with arms of aristocratic family (Florentine Salviati?), in which is clear the presence of skilled workers coming from urban environment.



Fig. 9 – Oratory, after church, of Pietrabuona Castle. Red: post-medieval interventions. (reworking of Erica Ganghereti’s elaboration)

The best preserved building, consisting of two floors, shows a modern aristocratic living style: the principal facade is built in squared stones, on the ground floor there is only one big portal with family arms, while on the upper floor there are big windows lighting large spaces.

In 15th century the Bishop of Lucca, Baldassarre Manni, built a new hospital near the old oratorio, later become church (AAL, Visite Pastoralì, n.5 cc.57 v-58 r., 15 aprile 1450). Skilled workers built a large building of ca. 50 square meters, consisting of only one floor. For the first time in the architectonic production of Pietrabuona they used ashlar in arches, which, maybe, testify the Florentine training of the «magistri»: they were assembled in the castle by the Bishop probably because they were working in the Valley.

In the 16th century Pietrabuona, like the entire Valleriana valley, was finally a pacific area in the Florentine State and lost its military role. Between the late 16th and early 17th century we have the construction of new houses and the modernization of old houses with the insertion of up-to-date imported or local worked portals (Fig. 12.5-6). The acculturation of the local skilled workers is clear comparing the new portal of the church

and the windows of a civil house, where the “court-model” is repeated in rough forms by local stonemasons. In civil window the local stonecutter repeated the pattern of the church portal, but the quality of the result was not the same (Fig. 10). Stones are approximately squared and the two corbels show the bad skill of the worker in copying the model: the simplified curved molding is not projecting and the narrowed architrave is at the same level of the corbels. Because of the wrong stones’ cutting, the masons employed one thin leveling brick in the right jamb of the window.



Fig. 10 – Architectonic elements and acculturation between late 16th and early 17th century. A. Portal of Church; B. Window of civil house.

In the following centuries buildings reflected the shift of the population and his economic interests in the valley and the rivers. There are few new buildings and they are rarely aristocratic homes. Significantly, the most rich houses of the 17th and the 18th century are in the lower part of the settlement.

In the 19th century a new big church (Fig. 11) and a new fountain were built in the lower part of the settlement.

As many restorations testify, the village had a demographic consistence until the 20th century, when some earthquakes brought down many houses.

After a new crisis in the first part of the 20th century, and a new big demographic collapse, now the centre is reoccupied by urban people on holiday. Documentation as well as archeological and architectonic studies are important instrument to control the contemporary wild reoccupation and to save the rural and lower historic buildings. (A.M.)

Conclusions

The archaeological study of buildings during the integrated survey campaign in Pietrabuona castle gave an important opportunity to the knowledge of village. Not invasive and not destructive methods of Building Archaeology and the employment of modern technologies laser scanner allowed us to study the architectonic evolution of the castle and to reconstruct its history. Thanks to the cooperation between architects and archaeologists, the preliminary results here presented show buildings’ stratigraphic analysis supported by technical accurate drawings become instrument of knowledge and elaboration.

Thanks to building survey, it was possible to use digital environments to analyze and measure buildings’ parts or elements far from direct observation and to create chrono-typological tables for windows, portals and wall techniques. Thanks to archaeological survey, on the other hand, it was possible to know better architectonic objects, their stratification and their historical dimension.



Fig. 11 – S. Matteo e Colombano Church. (elaboration of Silvia Bertacchi)

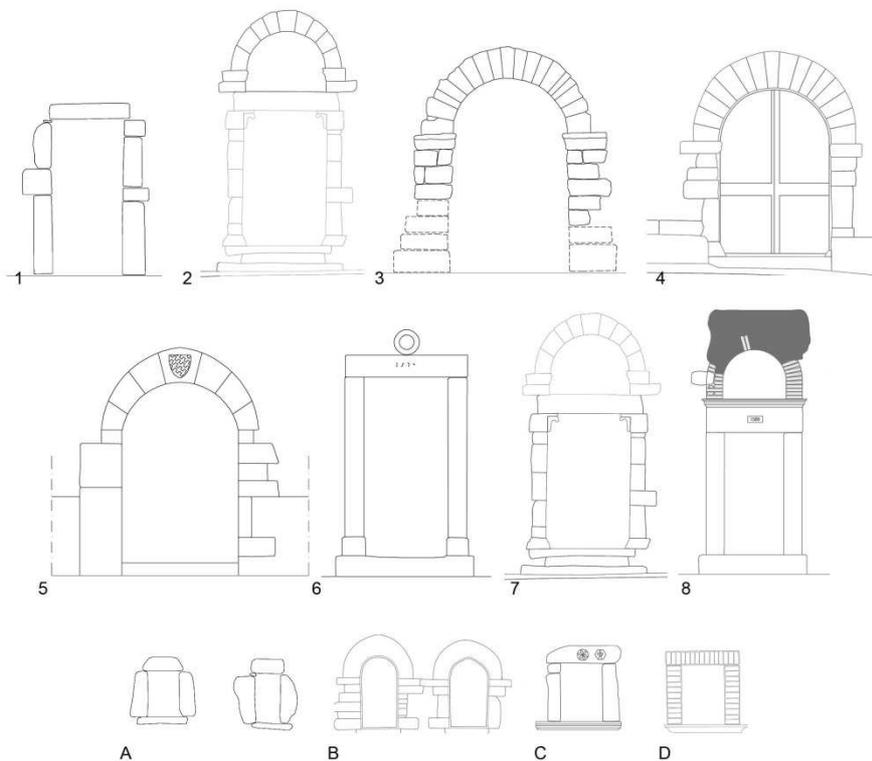


Fig. 12 – Preliminary and incomplete abacus of portal and windows of Pietrabuona. 1-2: 12-13th century; 3-4: 14th century; 5: 14-15th century; 5-8: last 18th century; A: 12-13th century; B: 14th century; C: 14-15th century; D: 17th century.

The limits of the archaeological study derive from the time and forces of the research survey, enough to scan all the buildings of the castle but not enough to analyze all the buildings of the settlement in detail. Failing the archaeological data, despite the relatively rich archival documentation, many chronological questions remain unsolved and, sometime, we can only make suppositions.

The research agenda provides to study in deep the settlement, getting stronger the collaboration between architects and archaeologists. Gis 3d, created for architectural classification, can receive archaeological data becoming an instrument for the spatial and historical analysis. Finally, widening the survey to other castles of the Valleriana Valley, the building and living forms and changes would be analyzed on a subregional scale, elaborating patterns of social, economic and material history of the area and offering an important instrument for conservation, development and valorization of the historical rural settlements. (G.L.; A.M.)

References

- BARSOCCINI D. (1971), *Memorie e documenti per servire all'istoria del Ducato di Lucca*, Lucca: Maria Pacini Fazzi (Anastatic Reprint, Lucca 1844: Bertini).
- FRANCOVICH, R. and VALENTI, M. (2005) "Forme del popolamento altomedievale nella campagna toscana (VII-X secolo)" in *Campagne medievali. Strutture materiali, economia e società nell'insediamento rurale dell'Italia settentrionale (VIII-X secolo)*, *Atti del Convegno (Nonantola, San Giovanni in Persiceto, 14-15 marzo 2003)*. Mantova: Società Archeologica.
- LAVORATTI, G. (2012) *Il castello di Pietrabuona – Materiali per la ricerca*. Pisa: Edizioni ETS.
- MARTINI, A. (1883) *Manuale di metrologia, ossia misure, pesi e monete in uso attualmente e anticamente presso tutti i popoli*. Torino.
- MEO, A. (2012), "Primi dati dall'analisi archeologica sulle architetture" in LAVORATTI, G. (ed.), *Il castello di Pietrabuona – Materiali per la Ricerca*, Pisa: Edizioni ETS, pp. 47-58.
- MERLO, A. (2010) *Il castello di Sorana*. Pisa: Edizioni ETS.
- MERLO, A. and LAVORATTI, G. (2012) "An "ante litteram" newfoundland: the Castle of Pietrabuona" in PARRINELLO, S. and BERTOCCI, S. and PANCANI, G. (eds.) *Between East and West. Transposition of cultural systems and military technology of fortified landscapes*. Firenze: Edifir.
- MERLO, A. (2012) *Il castello di Pietrabuona*. Pisa: Edizioni ETS.
- MILANESE, M. and QUIRÓS CASTILLO, J.A. (1997) "L'archeologia medievale e post-medievale della Valdinievole" in *Atti del Convegno su Archeologia della Valdinievole (Buggiano castello, 29 giugno 1996)*. Buggiano: Comune.
- QUIRÓS CASTILLO, J.A. (1999) *La Valdinievole nel medioevo. "Incastellamento" e archeologia del potere nei secoli X-XII*. Pisa: Edizioni ETS.
- SPICCIANI, A. (2008) *Viaggio in Valleriana*. Pisa: Edizioni ETS.
- REDI, F. (1989), *Edilizia medievale in Toscana*, Firenze: Edifir.
- REDI, F. (2004), *La frontiera lucchese nel Medioevo: torri, castelli, strutture difensive e insediamenti fra strategie di potere e controllo del territorio, sec. XIII-XIV*, Milano: Silvana.

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