Bruno Helly

AN ARCHAEOLOGICAL "READING" OF ARCHITECTURE

The San Lorenzello research project enabled us to verify in the field a number of hypotheses which those in charge of the programme designed to analyse the vulnerability of historic centres had taken as the basis for their work.

These specialists found, on the one hand, that very little was known about the rules which people applied in "bygone" times to protect themselves against earthquakes. They found, however, that the human societies and groupings of these times were very much aware of earthquakes, of their essential characteristics, recurrence in particular, and of their consequences. This twofold finding prompted us to examine architecture as we defined it (that is to say structures and public and private buildings in towns and villages) for traces of an earthquake culture amongst the communities of earlier times.

From the start this twofold finding was a reflection of the complementary nature of the studies undertaken by different groups of specialists who had joined forces to develop ideas on how best to protect cultural heritage in earthquake zones.

The specialists in natural sciences and building methods, the geophysicists and architects all thought that before any measures were taken they needed to analyse what made old buildings vulnerable to earthquakes. But at the same time, this need created the objective of reconstructing the technical rules and building methods used and the material facts as ascertained from concrete observation.

But for historians and archaeologists the observation of rules and building methods can only be correctly interpreted in every case, in every situation, if they are viewed as parts of a wider behaviour pattern, as the manifestations of the "attitudes" of individuals and groups, recorded in space and time, at a certain period - in brief, what we refer to as a culture.

This is what an archaeological reading of architecture means. Why archaeological? One could doubtless equally well talk of a historical, or anthropological reading. In our minds the term "archaeological" was the right one precisely because of the way in which archaeologists work. Their aim is to reconstitute the activities and behaviour patterns of individuals and human communities from previous eras by studying "relics", the remains and material traces they have left behind.

So archaeologists are historians - they process "historical facts" - but their basic data are not so much texts as physical objects (manufactured products, constructions, etc.) which they observe, catalogue and classify using methods identical to those of natural scientists.

Let us take a few examples. Archaeologists very often work with ceramics, vases and other objects of the potter's art. This kind of manufactured product is plentiful and exceptionally resistant to deterioration in the ground. Methods of classification and analysis of ceramics are very sophisticated. Very elaborate physical and chemical methods are essential to determine the composition of the clays used.

But for archaeologists, very precise knowledge of the levels of calcium, magnesium or other trace elements in a clay is of no use unless they can "convert" these analytical findings into historical facts: this clay with this composition came from this place - which is what the geochemist needs to know - and was used in this workshop to make this type of vase in this period - which is what the archaeologist needs to know.

The same applies to the analysis of old buildings.

The features of buildings are recorded - their construction, techniques used (masonry, timber framing, etc.) - and analysed in terms of forces and resistance of the materials. All these observations and the conclusions drawn for restoring or protecting these buildings come up against one question: the buildings are not new: they have lived, they have undergone changes and numerous repairs. What significance do these have in relation to the structures' original state? Has the structure of the buildings been altered? Have they become more or less vulnerable? How is it that buildings in a given street or a village all exhibit the same signs and the same types of repairs, etc.?

In short, we have to trace the history of these buildings, and the methods used in them; we have not only to observe, we have to interpret and place our observations in a context: the individual history of the buildings, the site, the human beings and the community who constructed and used the buildings.

This kind of operation is normally something for which architects are trained. They can look at a building, analyse its structure, identify traces of repair work, register that the bond of the walls has been modified, etc. For them these are just so many facts. For archaeologists, however, they are not facts, but sources of information about actions, technical or social forms of behaviour which can be placed in a chronological framework and related to a given community in a given situation.

Let us illustrate here what the pooling of our research endeavours produced in the

case of San Lorenzello. I will give just a few instances. Right from the start, geologists, geophysicists, architects and archaeologists all recorded the unusual windows found in San Lorenzello. Right from the start, too, reference was made to Cerreto Sannita, where this type of window surround is common. The observation was interesting, but went no further than noting the identity of forms, without any explicit reference to the history of these two villages which are neighbours and have experienced more or less the same events.

During the preparatory study observations were made concerning another feature of openings - windows and doors. It was noted that certain window- and door-sills were made not in a single piece but in two pieces or, to put it differently, were sawn in two. Those not made in this way, i.e. monolithic sills, were all cracked, presumably as a result of shaking and shocks to the building during earthquakes.

A fresh comparison with buildings in Cerreto showed that the method of two-piece window- or door-sills was routinely applied there. We know that Cerreto was rebuilt after the 1688 earthquake. It seems very likely that this feature of window and door surrounds was introduced at that point. It subsequently spread from Cerreto to San Lorenzello. This explanation gives us an interpretation of not one, but two technical construction features found in San Lorenzello. It also gives us an important - and verifiable - chronological marker for the village. The fact that cracked one-piece window - and door-sills are found either prior to or much later than the earthquake proves that this technical lesson was learned and then forgotten - after a fairly long period without a major earthquake. This gives us an interesting "historical fact": certain building methods transferred from one village to another, either because the same rules were imposed on craftsmen from both villages, or because men from one village went to the other to work.

A third feature of San Lorenzello architecture illustrates this transfer even better -

VULNERABILITY	TECHNICAL (static, passive)	SOCIAL (dynamic)	BEHAVIOUR OF SYSTEM
OLD	• earthquakes, effects • traditional antiseismic • technologies	• social structures • resources available • earthquake culture	
RECENT	• architectural character • seismicity analysis • modern techniques	• national regulations • local standards	• standards applied/ not applied • conversion of building applied for

particularly since in terms of improvements to the village's architecture it is a minus rather than a plus: the feature of carriage doors set at the corners of buildings. The article by Ferrigni and Lavorgna describes how this old technical "error" came into being and has been interpreted. It is clear that this typical feature of Cerreto was transferred to San Lorenzello without any real attempt to adapt it to the local situation.

Non-technical considerations may also have played a part and need to be elucidated (from the archives, for example) - questions of regulation or fashion? social standing or degree of affluence? - in addition to the more or less automatic and unthinking transfer operated by the craftsmen themselves.

I trust these examples will help to show what is needed for a historical and archaeological reading of architecture. It enables us to interpret and evaluate specific construction features by underlining the strengths, weaknesses or questionable merits of the technical solutions adopted by communities through the centuries, and not only to identify them and quantify them in tables. By a kind of ripple effect the data observed or analysed take on an added dimension of their own and are enriched by new additions.

The virtues of the multidisciplinary approach adopted in studying the vulnerability of old buildings become apparent as a result. It allows the complementary viewpoints of each discipline to be brought together into a table showing the input of each discipline relative to the others and illustrating the general aspirations behind the venture as a whole.

The debate is taken one step further and produces an even more "comprehensive" formula for examining the phenomena analysed by specialists - natural scientists, architects and historians. This formula is the research initiatives defined by the Scientific Coordinating Committee for the European Programme on Ancient Built Heritage in Earthquake -Risk Areas, its aim being to measure, from the architecture of private houses and grander historic buildings, how far the leaders of a community - or the community itself - made allowances for the risk of earthquakes and why. The objective is to identify the overall earthquake control measures or technical devices which authorities or communities studied, produced and employed in constructing, restoring or reconstructing their buildings. The remit of this programme thus encompasses the areas of expertise of earth scientists, architects, archaeologists and historians.