Assunta Lavorgna

METHODS AND MATERIALS

In San Lorenzello many buildings do not have foundations, especially those which are built on poorly compacted ground and thus have no basements.
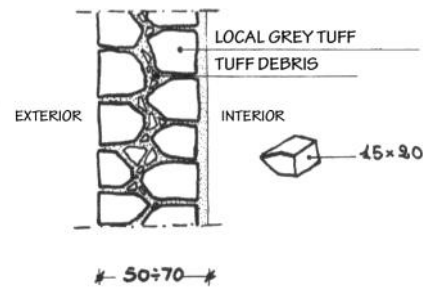
For a long time the materials used were those found locally: grey tuff and rubble. In the late 18th and early 19th century limestone came into common use, first of all dressed and later hammer faced. These two materials were used for both double and single facing depending on the thickness desired.
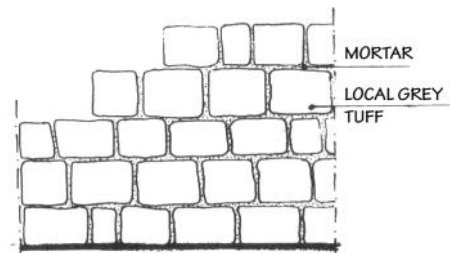
STONE MASONRY
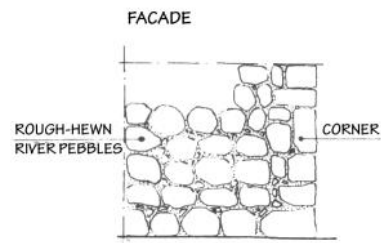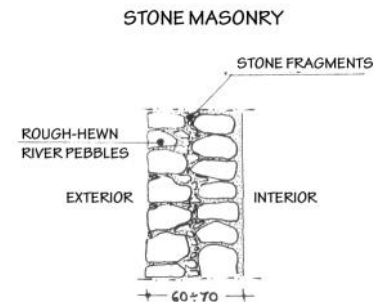
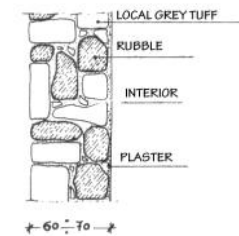FACADE

DOUBLE-FACED TUFF MASONRY
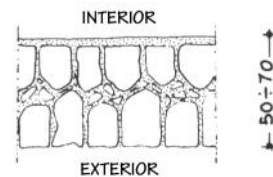
SECTION

FACADE

There is also a building method very common in the oldest area and used almost exclusively for party walls and the walls of intermediate floors: this is composite masonry using tuff and rubble, a conglomerate of very large stones.

MIXED MASONRY, STONE AND TUFF

FACADE
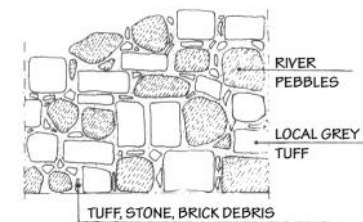
Stratification

Generally speaking, all the buildings have a ground floor made of rubble (very often) or of mixed masonry, but all of them have a stone footing at least 1.50 m high off the ground.

Tuff is used only for the second floor of buildings and upwards.

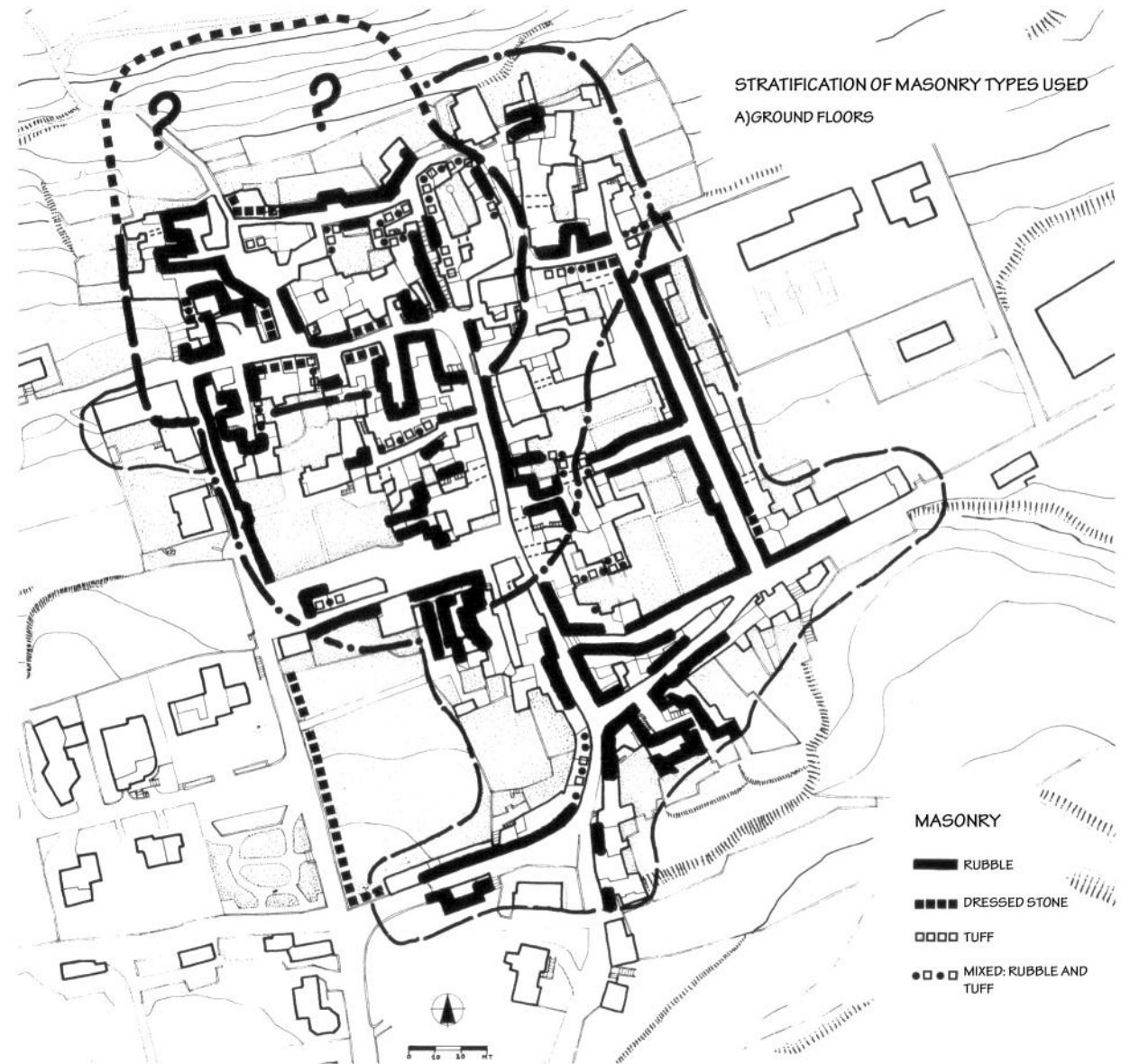Virtually all buildings using rubble for their first and second floors have their top courses made of tuff, at the level of the beams supporting the topmost floor.

Brickwork is rare though it may be used to repair walls or for recessed chimneys or vents. It is also used for arches and lintels alternately with tuff, rarely with stone.

STRATIFICATION OF MASONRY TYPES USED

A) GROUND FLOORS

MASONRY

RUBBLE

DRESSED STONE

TUFF

MIXED: RUBBLE AND TUFF

STRATIFICATION OF MASONRY TYPES USED

B) FIRST FLOORS

MASONRY

▰▰▰ RUBBLE

▰▰▰▰ DRESSED STONE

▱▱▱▱ TUFF

●▫●▫ MIXED: RUBBLE AND TUFF
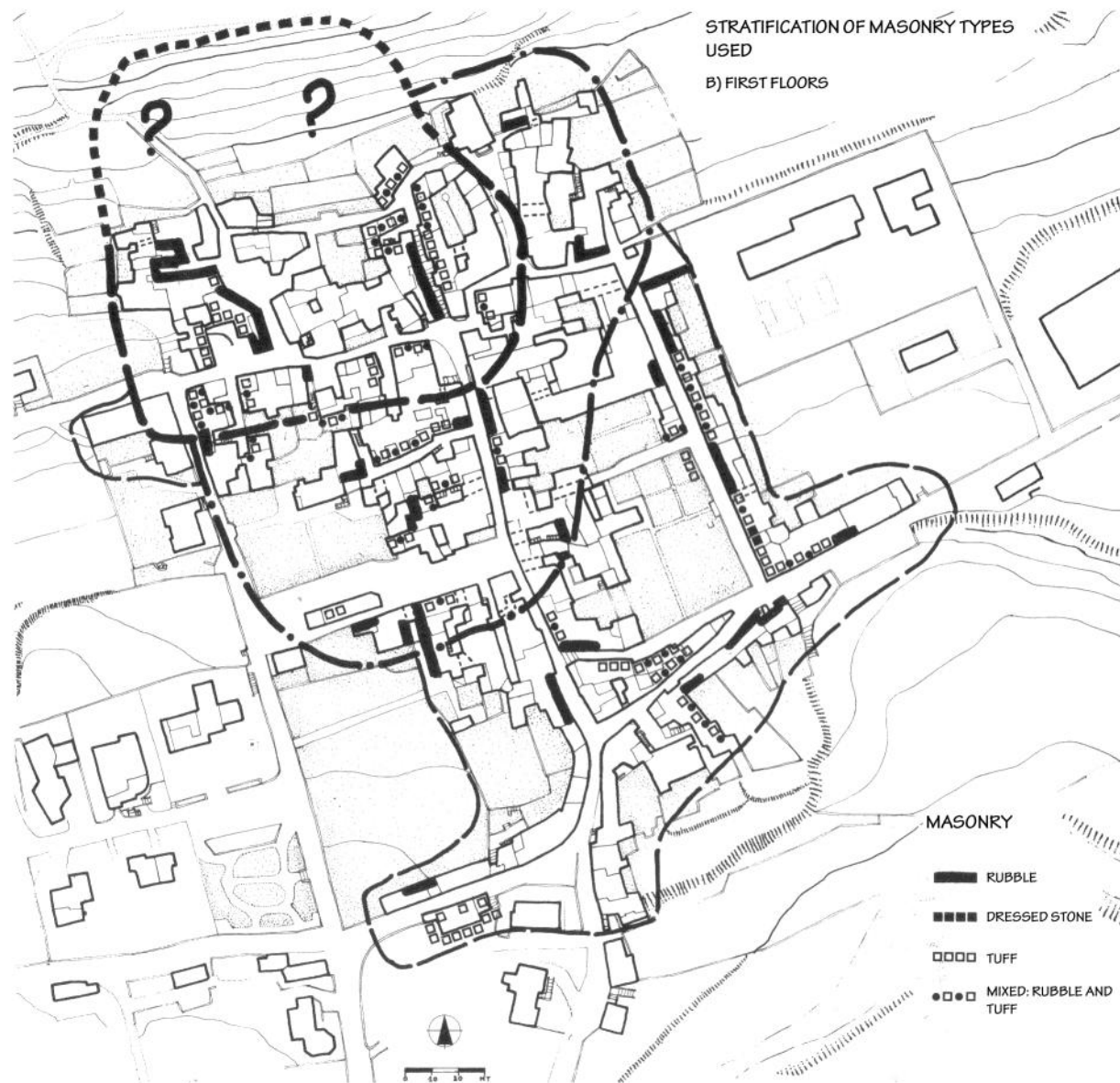
Earthquake resistance

The types of masonry and horizontal structures used are not remarkable in terms of their resistance to earthquakes. The way in which the strata are placed may incidentally help earthquake resistance (by lowering the building's overall barycentre).

In reality the method used is dictated by functional and economic considerations. Stone, which is more expensive, is used only where the building had to be protected against humidity. We nevertheless looked at its distribution over the entire area of habitation at the time of the various earthquakes, to see if it was indeed a factor in earthquake resistance.

The method is uniformly present in buildings from the different periods, so it did not come into existence as a result of one of the major earthquakes. Our conclusion was that if the stone-tuff stratification represents a factor in the community's earthquake culture, it goes back a very long way.

We thus extended the scope of our analysis to the methods seen in neighbouring villages, and found that those used in San Lorenzello are common throughout the area in which tuff crops out, whilst in the highest part (Cusano Mutri, Pietraroja), where there is no tuff, all masonry work uses stone, even though the seismicity of the area is the same.

We can thus conclude that the earthquake resistance which comes from stratification of materials is an additional, albeit secondary, benefit which a poor community secured by using its available resources intelligently.

Horizontal structures

The only covering of basements or semi-underground floors is the ceiling vault, usually a single structure. At ground floor level it is used for porches and large rooms. At first floor level vaults are found only in rooms under terraces (in which case it is often a narrow type of vault) or as a covering in the living rooms of large buildings.

Wooden floors predominate, though in recent years they have been replaced by iron joists and hollow brick. Iron floors and vaulting cells are quite rare and are often the result of structural alterations made at the beginning of the century. Top-storey floors, unless replaced recently by iron or prestressed concrete structures, are nearly always of wood, whether the covering is a roof or a terrace. Roofs are of wood and pantiles.

Analysis of horizontal structures does not, ultimately, reveal any specific features of earthquake resistance. The vertical order (structures exerting downthrust or upthrust) is the same as that seen everywhere in seismic and non-seismic areas alike.
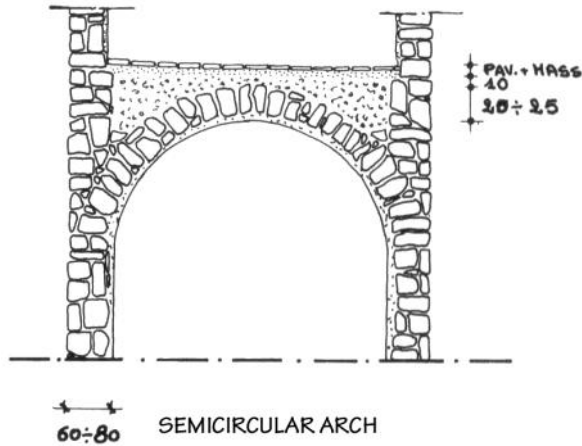
And structures exerting thrust were in any case used in upper floors for ornamental reasons only.

SEMICIRCULAR ARCH

WOODEN FLOOR

WOODEN FLOOR

WOODEN COVERING

IRON FLOOR
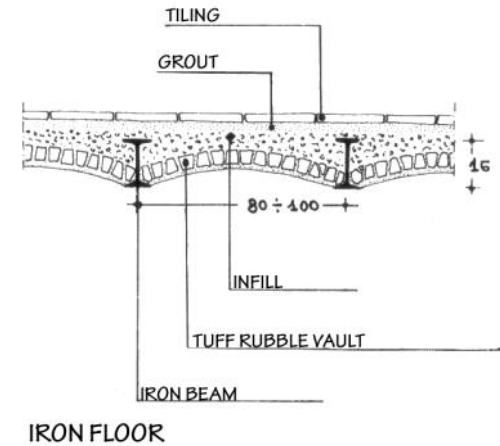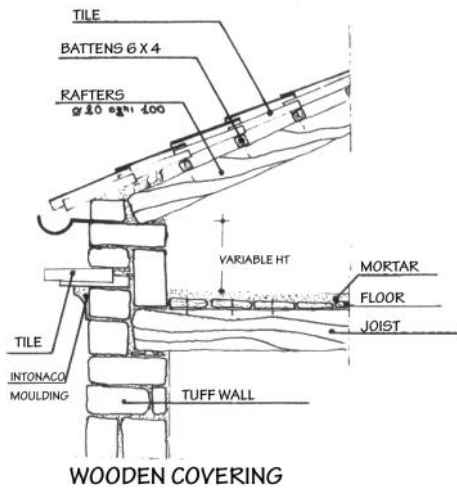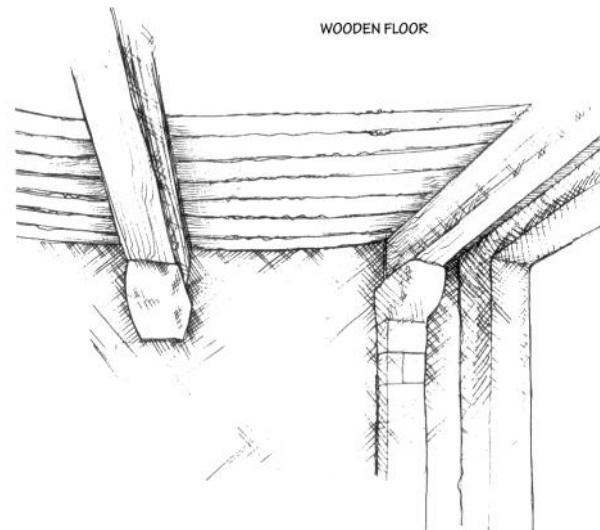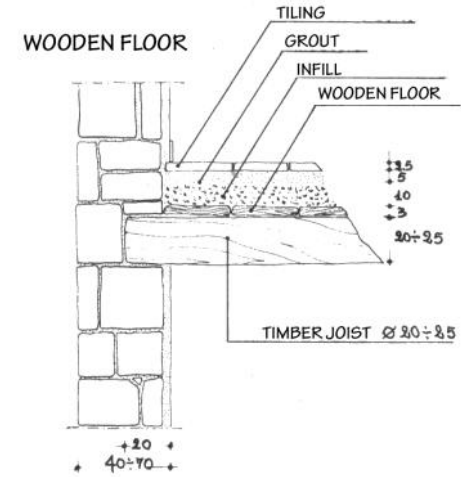
Openings

Three types of doorways were observed in San Lorenzello: the rectangular doorway with a lintel, the semi-circular arched doorway and the rectangular surbased arch doorway.

Different variants on each of these types were seen for each historical period (identified by the frequency with which each type was found in the various areas of the urban fabric), and for each period there was a modest and an affluent form. The former was seen in ordinary dwellings, the latter in more important buildings such as churches, convents and mansions.

The basic type is the modest version, most commonly found in the centre.

The most usual type of entrance is the modest version of the semi-circular arched doorway. This is intermediate in age (post-1688) and typically comprises stone blocks which are regular in width and thickness (approx. 25 cm), variable in height and dressed on the exposed surface. Doorways with a lintel are also common, especially in the more recent buildings, both modest and affluent.

The oldest version of these two doorway types (with semi-circular arch or lintel) has the door-sill end-fixed between the jambs. More recent ones have their jambs resting on it.

The surbased arch doorway unquestionably dates from a more recent period. Rarely seen in the older fabric, it always has irregular voussoirs, which gave wider entrances or marked what are known as "lambies". The presence of the most recent version of this type of opening is more the reflection of a functional imperative. Usually it is used to front a "vetrina" (shop) or as a glass door with small shutters (ground-floor dwelling).
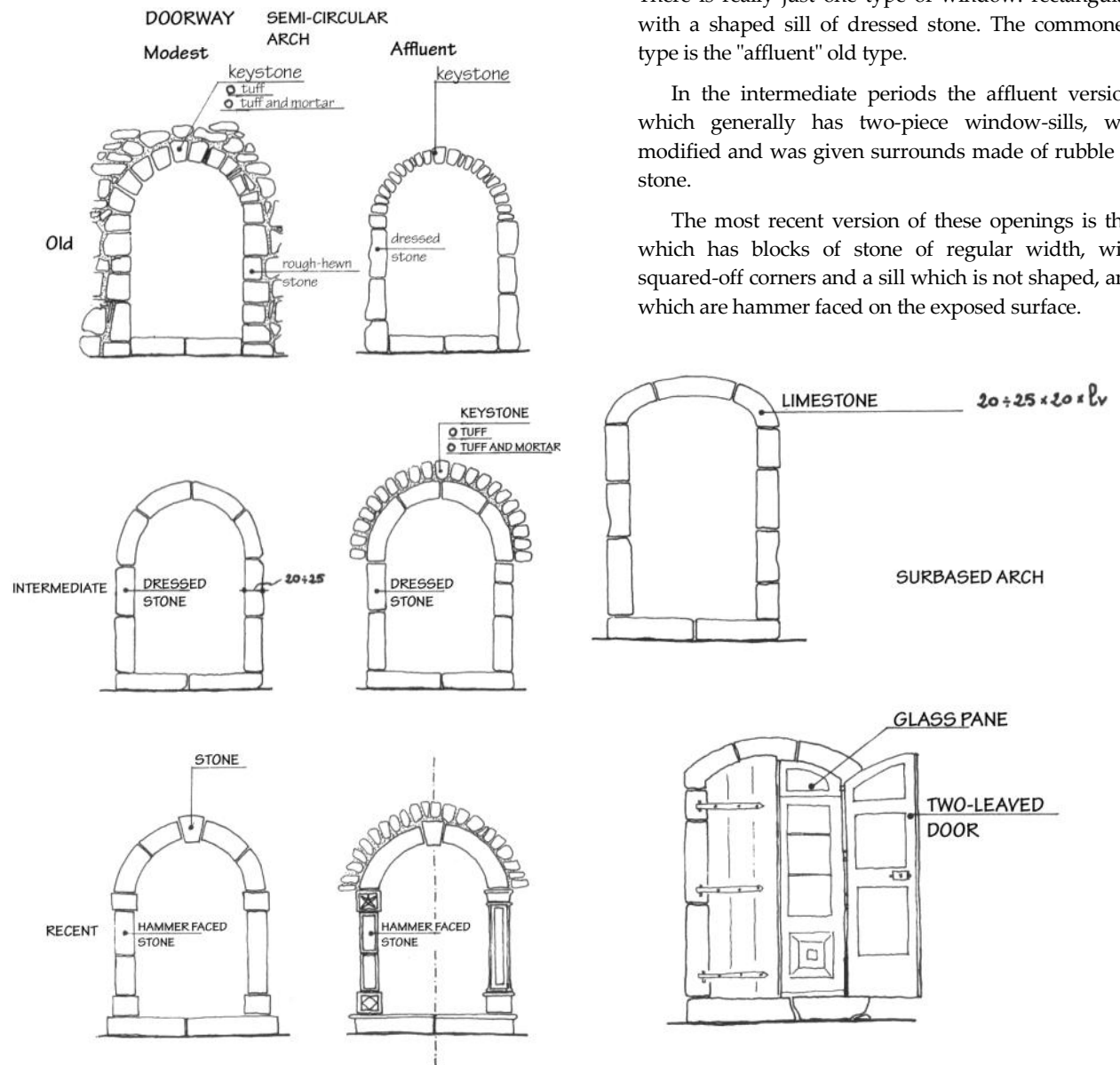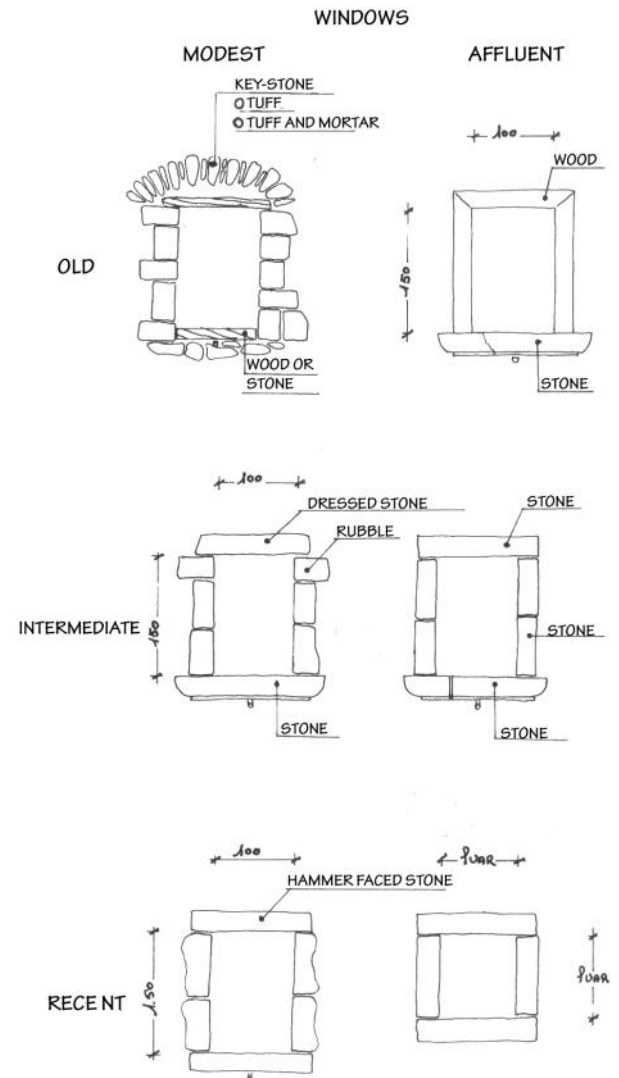

There is really just one type of window: rectangular, with a shaped sill of dressed stone. The commonest type is the "affluent" old type.

In the intermediate periods the affluent version, which generally has two-piece window-sills, was modified and was given surrounds made of rubble or stone.
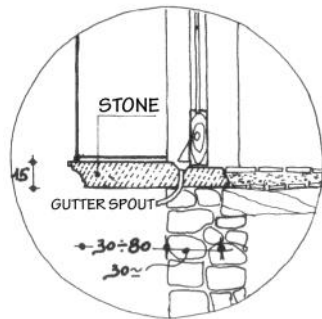
The most recent version of these openings is that which has blocks of stone of regular width, with squared-off corners and a sill which is not shaped, and which are hammer faced on the exposed surface.

Balconies were introduced in recent times, as shown in the sectional diagram A-A[1] below. These are seen in the very affluent houses, outside top floors or added floors, after 1805.

Sometimes, though rarely, small balconies can be seen in the older parts of the village fabric, often adaptations of a window opening. These do not protrude and have sills similar to window-sills.

WINDOWS

BALCONY

SECTION A-A₁