

DIAPHRAGM ARCHES AND STONE SLAB ROOFS*

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For many centuries buildings in which stone arches with stone slabs laid horizontally from one arch to the next in order to form a roof, a ceiling or an upper floor were a fundamental feature on Malta, where wood was scarce but stone was readily available. Examples of this type are datable to the fifteenth century and the practice may well have been much older; whether it was introduced from outside Malta or was developed independently on the islands cannot be established. The standard histories of Maltese architecture have sought the origins of this form in unwooded parts of early Christian Syria,¹ and a recent study of comparable buildings in medieval Catalunya discusses the same Syrian examples while noting possible Muslim importations into Spain where, however, the arches were usually covered with wood rather than stone.²

The earliest datable Maltese example of arches covered by stone slabs, or rather of arches carrying masonry on which stone slabs rested, is that of the Annunciation church at Hal-Millieri datable circa 1480. There, and also at San Niccolò, Siggiewi, the arches were built separately from the side walls and were not bonded into them, while the roof slabs were virtually horizontal with a very slight incline for drainage purposes.³ An earlier church below that at Hal-Millieri, which perhaps dated before

* Figures 1-3 and Plates 1-4 and 6-10 are by Joan Fuguet i Sans; Plate 5 is by E. Ventosa.

¹ Eg. Q. Hughes, *The Building of Malta during the Period of the Knights of St John of Jerusalem: 1530-1795*, (2nd ed: Malta, 1967), 43-44, and L. Mahoney, *A History of Maltese Architecture from Ancient Times up to 1800* (Malta, 1988), 79-80, both with bibliography. Mahoney, 79, asserts that the system was used in Malta by "the Arabs" and suggests that it is not unlikely to have been employed prior to their arrival.

² J. Fuguet i Sans, "Apreciacions sobre l'Ús de les Cobertes amb Arcs diafragma a l'Arquitectura medieval catalana," *Acta Mediaevalia*, vii-viii (1986/7); *idem*, "L'Arquitectura de les Capelles templeres a la Catalunya Nova," in *Aplech de Treballs: Centre d'Estudis de la Conca de Barberà*, ix (Montblanch, 1989), with photos, plans and dimensions; *idem*, *L'Arquitectura dels Templers a Catalunya* (microfiche ed., Barcelona, 1990) – published edition in press; *idem*, "Contribució a l'Estudi dels Orígens del Gòtic meridional: Influència de l'Arquitectura popular en les Construccions templeres i cistercenques catalanes," in *Miscel.lània d'Homenatge a Joan Ainaud de Lasarte* (Barcelona, in press). The church at Berrús was moved in 1967 during the construction of a dam on the Ebro.

³ *Hal-Millieri: a Maltese Casale, its Churches and Paintings*, ed. A. Luttrell (Malta, 1976), 69-88 *et passim*, and *Excavations at Hal-Millieri, Malta*, ed. T. Blagg *et al.* (Malta, 1990), 115-125 *et passim*, both providing details, plans, sections, photographs and discussions.

about 1400, had a similar system of arches and possibly, therefore, the same type of roofing. The study of the Hal-Millieri church again looked to Syrian examples while noting possible parallels in twelfth- or thirteenth-century Latin Syria; it also discussed churches in Sicily which had similar ground plans but where it is doubtful whether the roofs were of stone or indeed whether they were laid horizontally.⁴

In Spain stone arches were normally covered with wood, but a group of small but carefully-built churches, probably dating to the thirteenth century, in the area of Tarragona in Southern Catalunya at Algars, Pinyeres, Almudèfer, Camposines and Berrús (Plates 1, 6, 9) have slabbed stone roofs placed above arches which are between 50 cm and 125 cm apart. The arches were pointed rather than circular and the masonry above the arches was built up either to support an upper floor or, as in these churches, to carry a sloping roof. The slabs were laid in such a way that they overlapped each other (Fig. 1; Plates 2-3). In some cases the arches sprang from the floor or very close to it.⁵ At Sant Bartomeu de les Camposines the arches are 50 cm apart; the slabs, as in all the churches, stretch from arch to arch as in Malta but the roof is never horizontal; and the pointed arches sit on a projection from the wall without reaching the ground (Plates 4, 5, 8). In Catalunya, unlike Malta, the roofs were certainly never flat; they were sloping and, in modern times at least, are covered by overlapping tiles. The outer wall was built between rather than outside the arches and, when the arches did spring from the floor, as at Camposines (Fig. 1; Plates 2-3) and at Algars, there were perimeter benches. In other cases, as at Pinyeres and Berrús (Figs. 2-3; Plates 7-10), the arches sprang from small pillars and there were no benches. The slabs never followed the curve of the arch as at San Girgor at Żejtun on Malta.⁶ A similar arrangement, but in this case with a covering which had to be flat in order to support an upper floor, is to be found in the mill known as *la Cadena* in the Templar house at Vallfogona in the province of Tarragona.⁷

Stone roofing may have been used in relatively humble buildings in Catalunya because in the long run it was cheaper. The Catalan examples, which date between the twelfth and fourteenth centuries, provide no indication as to how or when slabbed roofs on diaphragm arches were either developed or were introduced into Malta. The system could have come from Syria, North Africa, Spain or Sicily at any

⁴ A. Luttrell, "Historical and Architectural Postscript," in *Excavations*, 124-125; certain Sicilian churches which seem similar are discussed in a forthcoming publication by Mario Buhagiar.

⁵ Fuguet (1986/7), 446; *idem* (1990), 520-523; *idem*, "Contribució" (in press); for details concerning the roof, see E. Ventosa, *Esglésies singulars de la Terra Alta* (Tarragona, 1986), p. 19.

⁶ M. Buhagiar, "Medieval Churches in Malta", in *Medieval Malta: Studies on Malta before the Knights*, ed. A. Luttrell (London, 1975), 174 and plate 13(b).

⁷ Fuguet (1989), 48; *idem*, "Contribució" (in press).

point between the second century and the fifteenth century.⁸ Neither the house types at Mdina described in fifteenth-century documents nor the Semitic terminology used in their descriptions can safely be ascribed to a Muslim period before the twelfth century.⁹ The system of stone slabs on arches was not necessarily brought to Malta by Muslims, whether from Syria or elsewhere, either directly or by way of Spain or Sicily.¹⁰ It may have been that the builders and masons of Muslim Malta belonged to a class that preferred to emigrate rather than to remain in Malta as Christians and that they were replaced from Sicily by builders who brought Sicilian methods with them; but that remains a hypothesis.¹¹

⁸ That Fuguet's examples are predominantly from Templar buildings is partly because they were the subject of his researches and has no bearing on Maltese developments.

⁹ G. Wettinger, "The Arabs in Malta" (2nd ed.), in *Malta: Studies of its Heritage and History* (Malta, 1986), 95-96, which includes important details in a discussion of the pre twelfth-century period; additional detail in S. Fiorini, "Malta in 1530," in *Hospitaller Malta 1530-1798: Studies on Early Modern Malta and the Order of St John of Jerusalem*, ed. V. Mallia-Milanes (Malta, 1993), 153-157.

¹⁰ A. Luttrell, in *Hal-Millieri*, 27, noted that Maltese house types were not necessarily "Muslim or African" in origin but might rather be "Roman or Sicilian". This remark was quoted verbatim in L. Mahoney, "Secular Architecture," in *Birgu: a Maltese Maritime City*, ed. L. Bugeja et al., ii (Malta, 1993), 432, as showing that Luttrell had argued for a Roman or Sicilian solution; it was repeated in public at the presentation of that book in Valletta in May 1993. Mahoney's carelessness creates a misunderstanding, since the following sentence actually reads: "In any case, in the absence of datable medieval examples on Malta or Gozo, little or nothing can at present be deduced from house plans or stylistic details."

¹¹ This suggestion represents an important intuition advanced in Mahoney, *History*, 51-59, but it cannot be proved; it is scarcely supported by his historical and philological arguments or by his list of modern Maltese building terms.

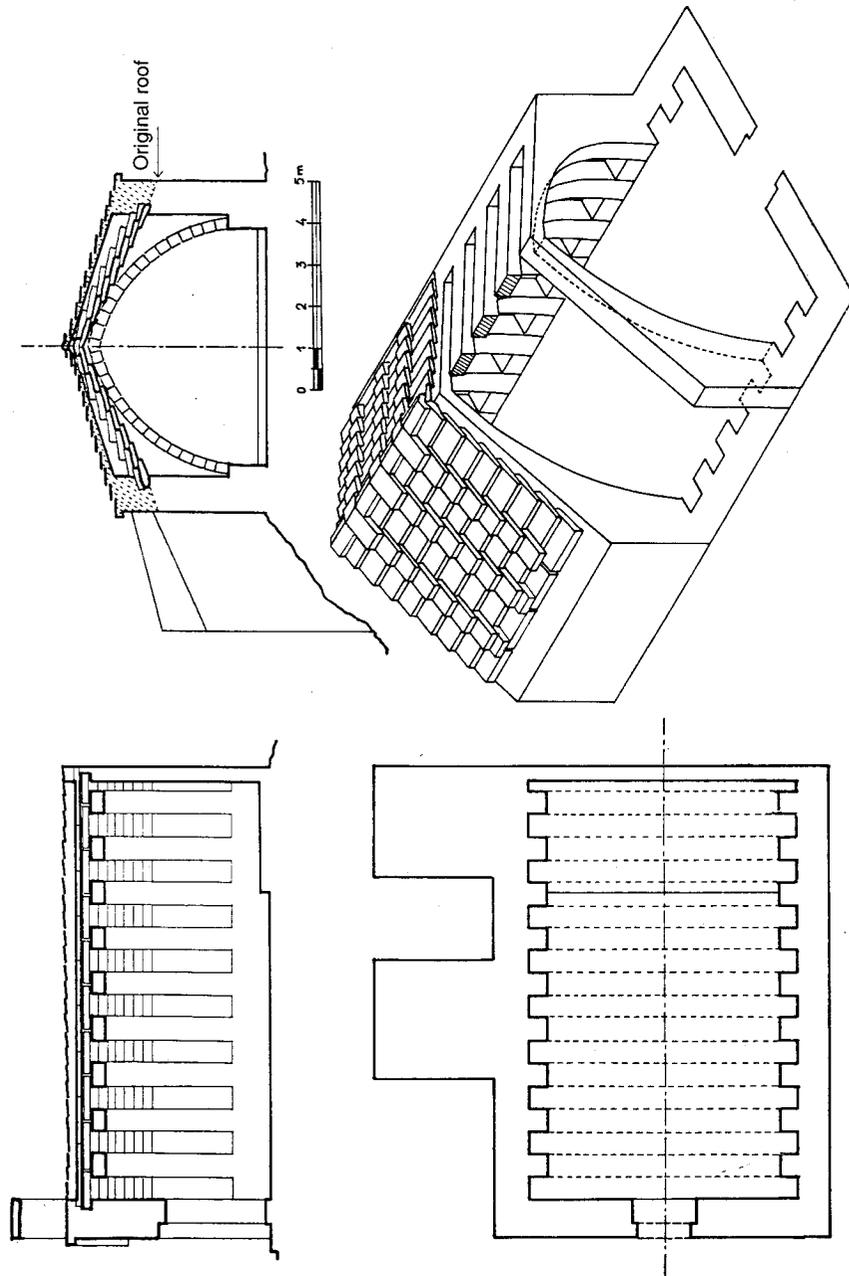


Figure 1: La Trasfiguració de Pinyeres

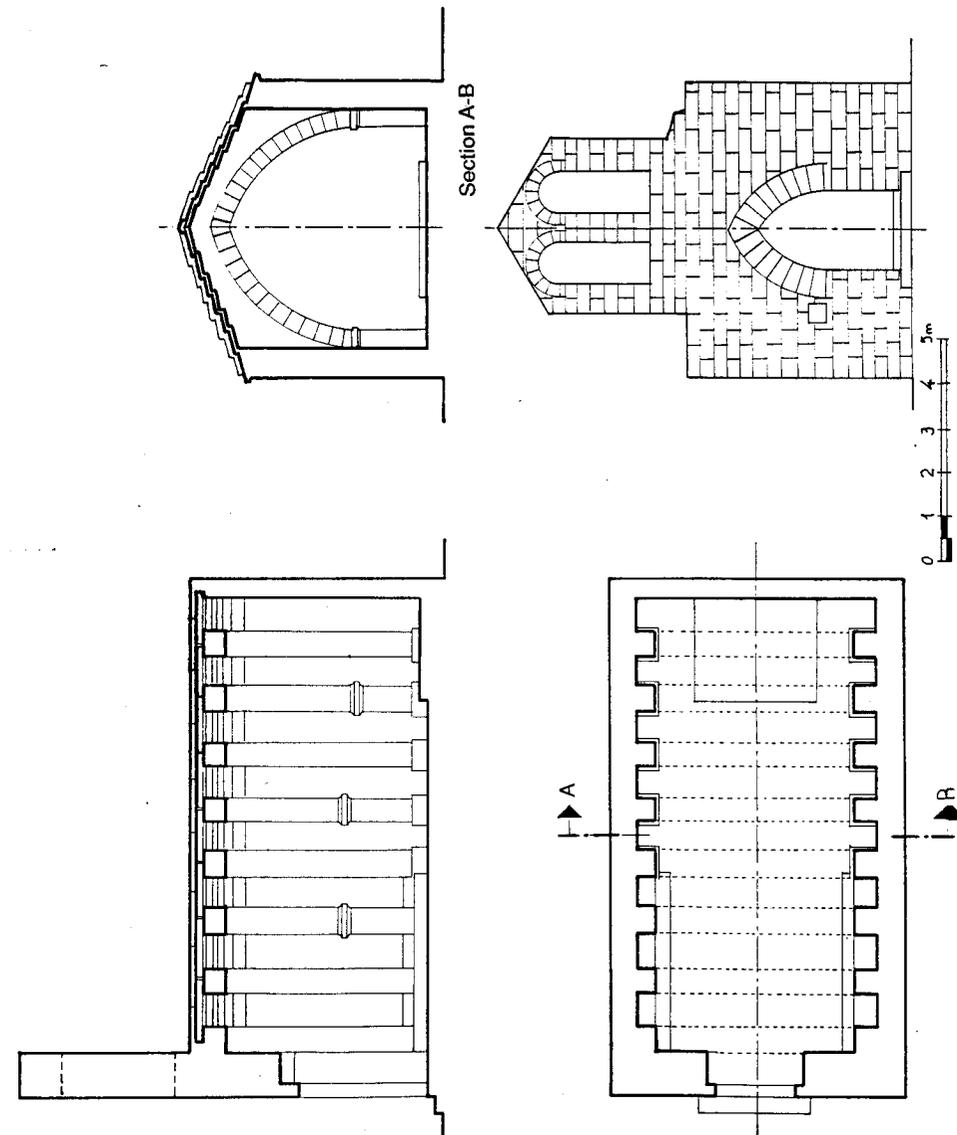


Figure 2: Santa Magdalena del Berrús

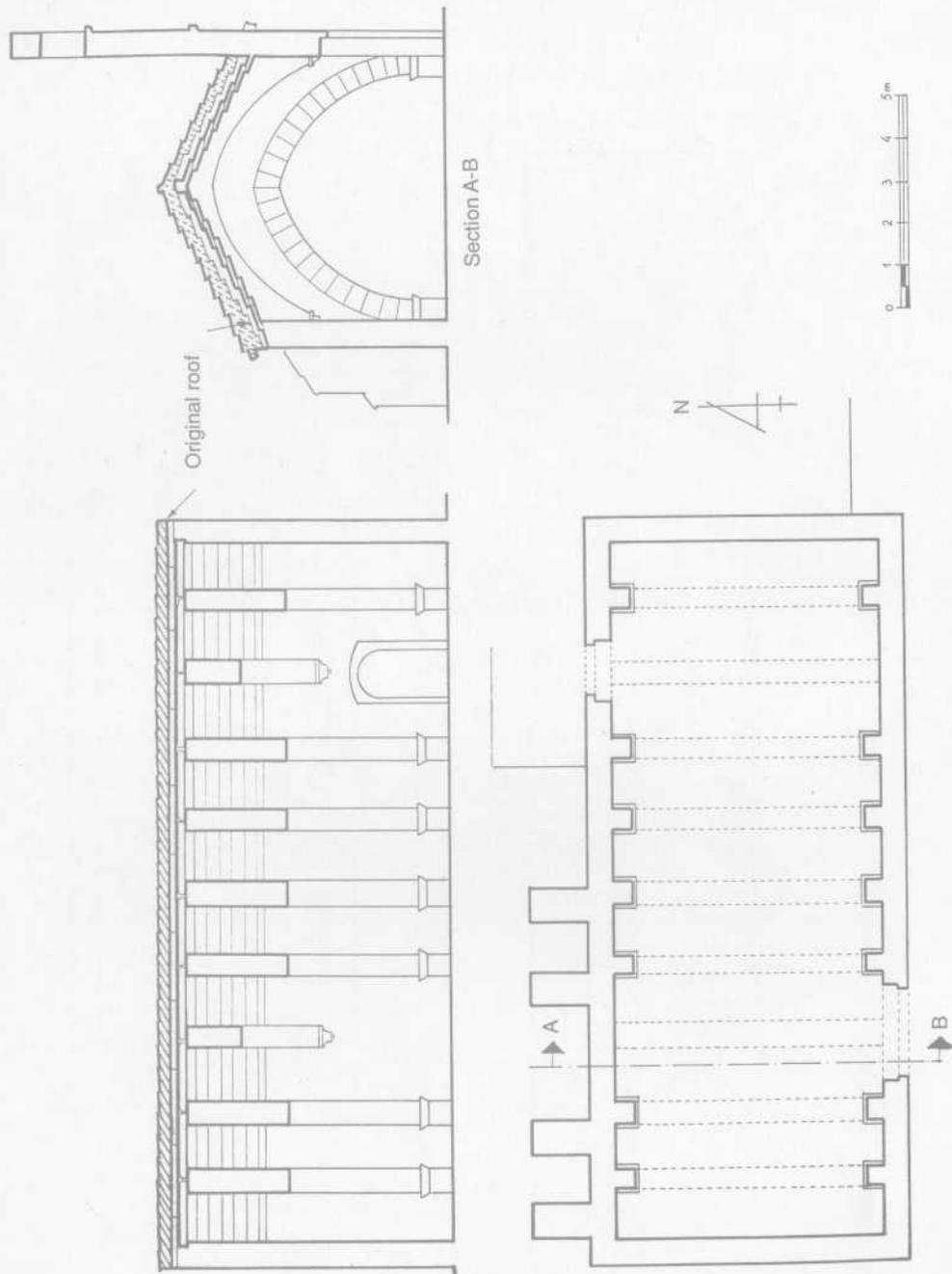


Figure 3: Sant Bartomeu de les Camposines



Plate 1: Sant Bartomeu de les Camposines: Exterior

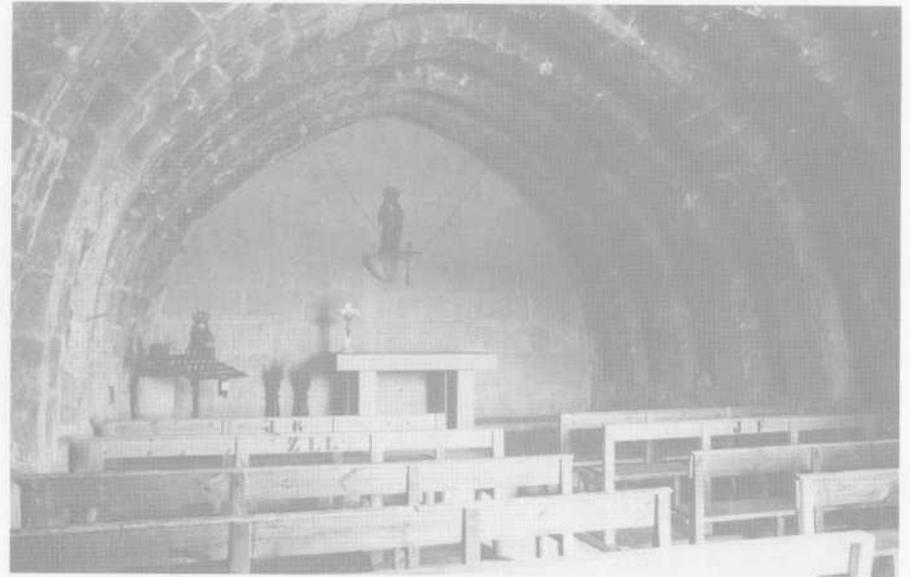


Plate 2: Sant Bartomeu de les Camposines: Interior

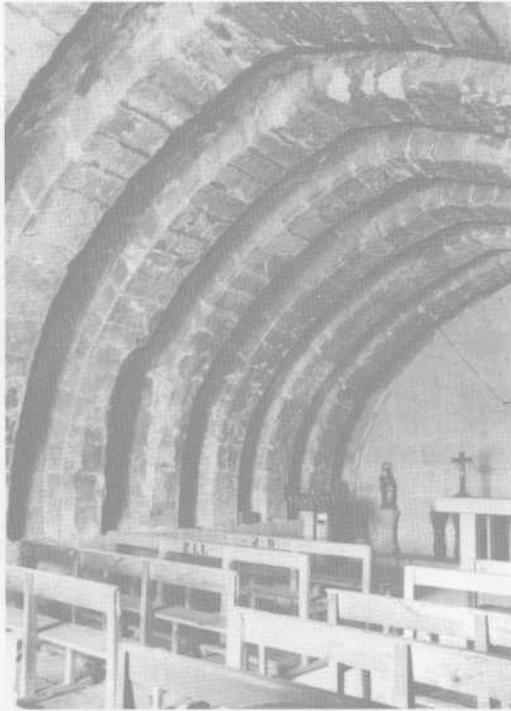


Plate 3: Sant Bartomeu de les Camposines: Interior



Plate 4: Sant Bartomeu de les Camposines: Detail of Arches

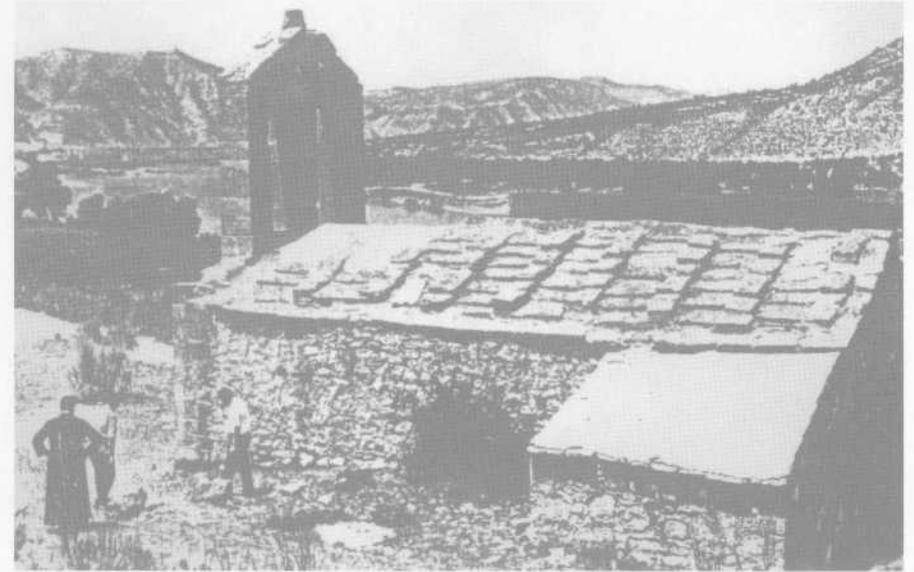


Plate 5: Santa Magdalena del Berrús: Before Removal from its Original Site in 1967



Plate 6: Santa Magdalena del Berrús: Present Site

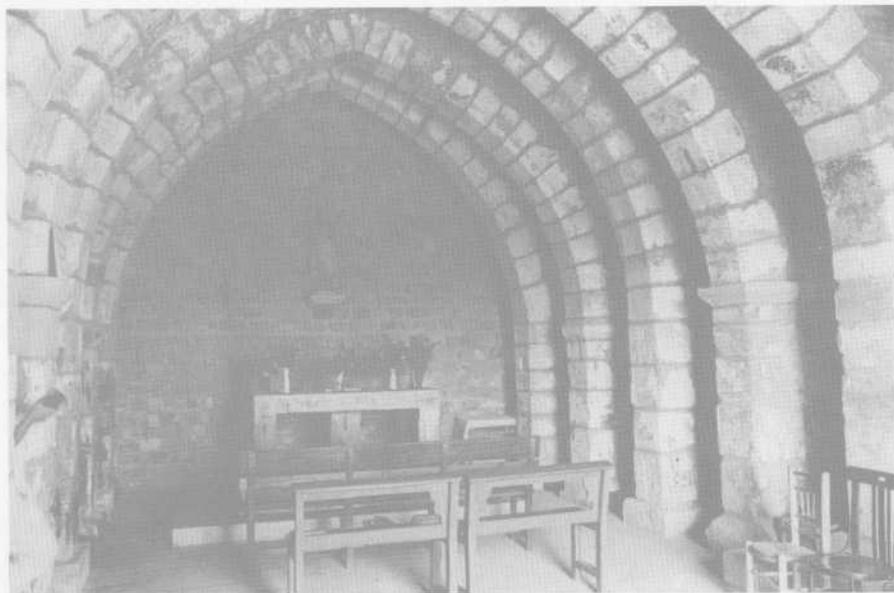


Plate 7: Santa Magdalena del Berrús: Interior



Plate 8: Santa Magdalena del Berrús: Detail of the Roof

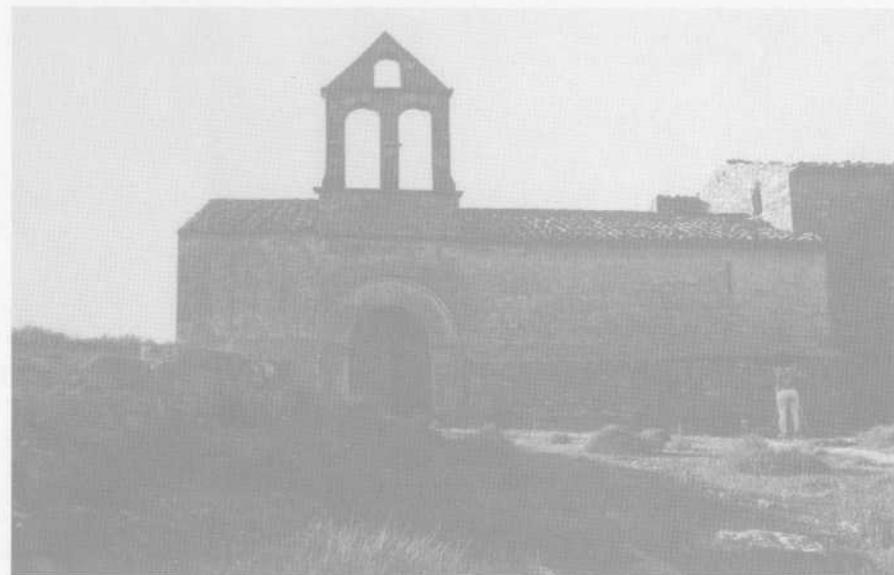


Plate 9: La Trasfiguració de Pinyeres: Exterior

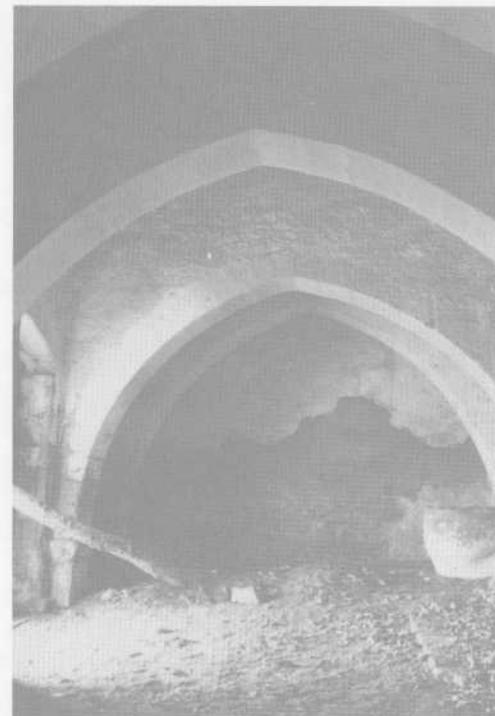


Plate 10: La Trasfiguració de Pinyeres: West Side