Sustainable Urban Rehabilitation in Europe

Heritage Problems. Causes. Solutions

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Sustainable Urban Rehabilitation in Europe

3rd Semester

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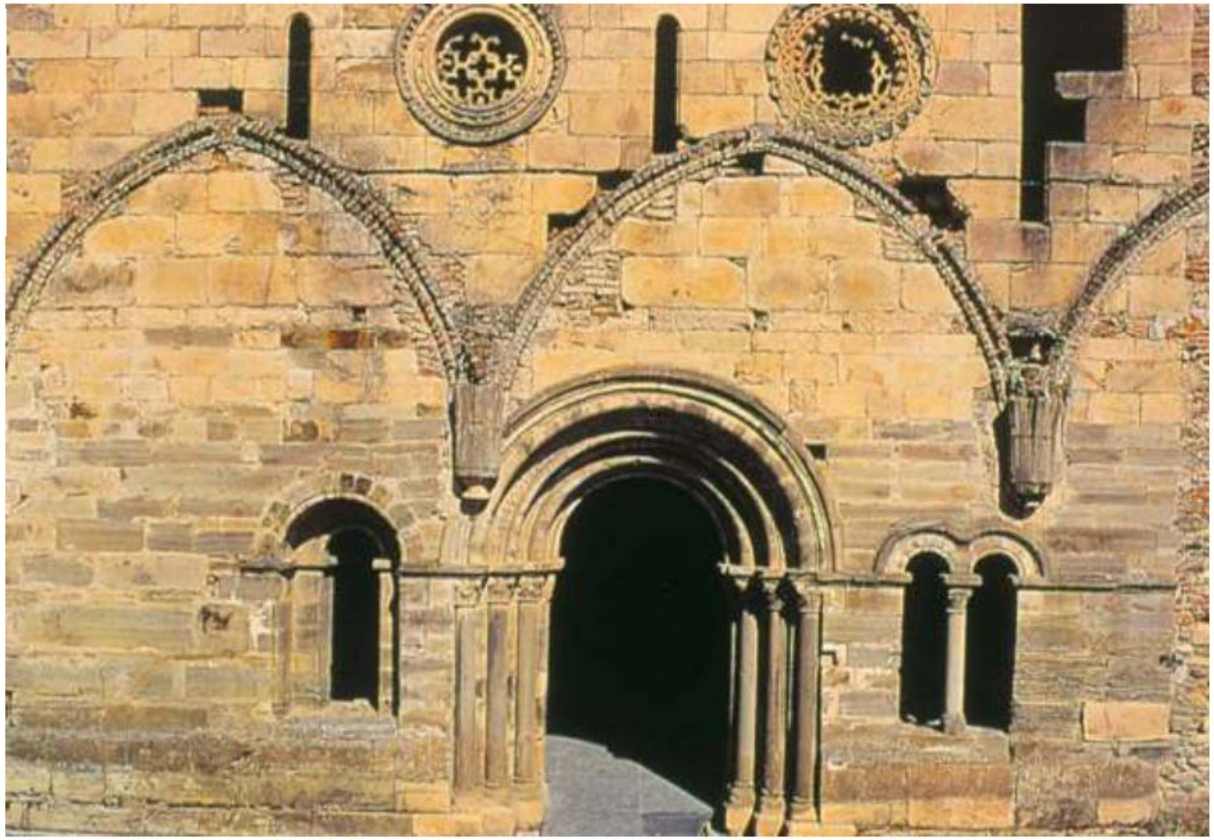
Camila Burgos Vargas

Heritage Problems. Causes. Solutions

3 ECTS

SH
Sustainable Heritage

EC
Elective Courses



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SURE
SUSTAINABLE URBAN REHABILITATION IN EUROPE

UNIVERSIDAD POLITÉCNICA DE MADRID

1. INTRODUCTION
2. FOUNDATIONS: DAMAGES
3. FOUNDATIONS: REPAIR SOLUTIONS
4. WALLS: CONSTRUCTIVE SYSTEM
5. WALLS II: PROBLEMS AND CAUSES
6. WALLS III: SOLUTIONS
7. **VAULTS: CONSTRUCTIVE SYSTEM**
8. VAULTS II: PROBLEMS AND CAUSES
9. VAULTS III: SOLUTIONS
10. FLOORS
11. WOOD
12. ROOFS: CONSTRUCTIVE SYSTEM, PROBLEMS AND CAUSES
13. ROOFS II: SOLUTIONS
14. OTHER TRADITIONAL STRUCTURES
15. SURFACE FINISHES, INTERIOR WOODWORK

CURRICULAR CONTENTS

HERITAGE PROBLEMS. CAUSES. SOLUTIONS

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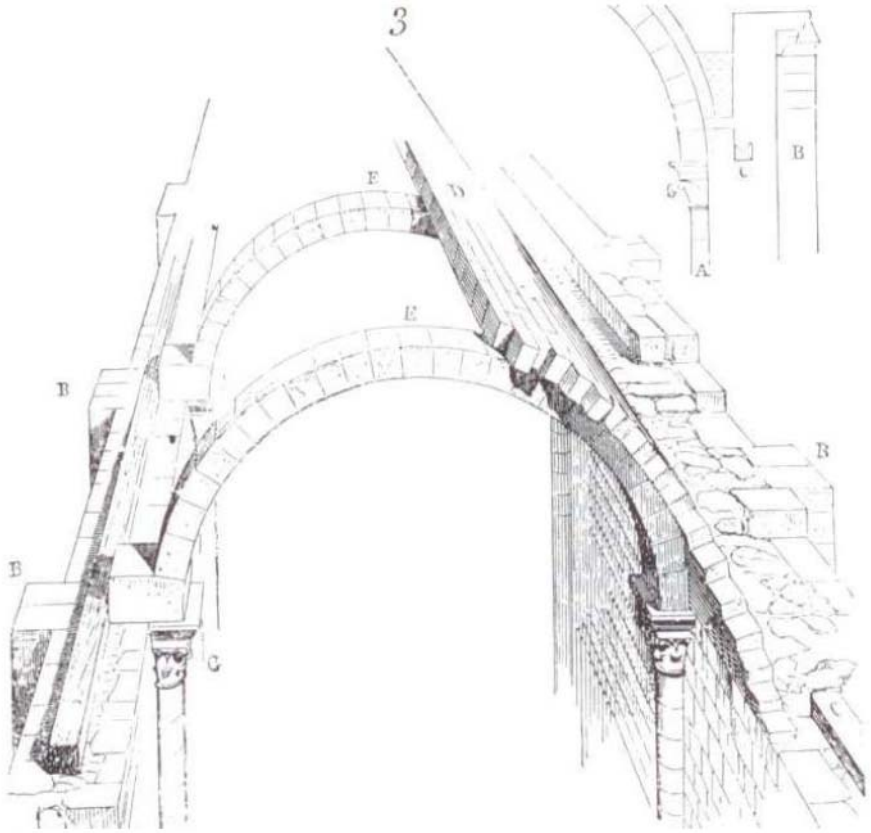
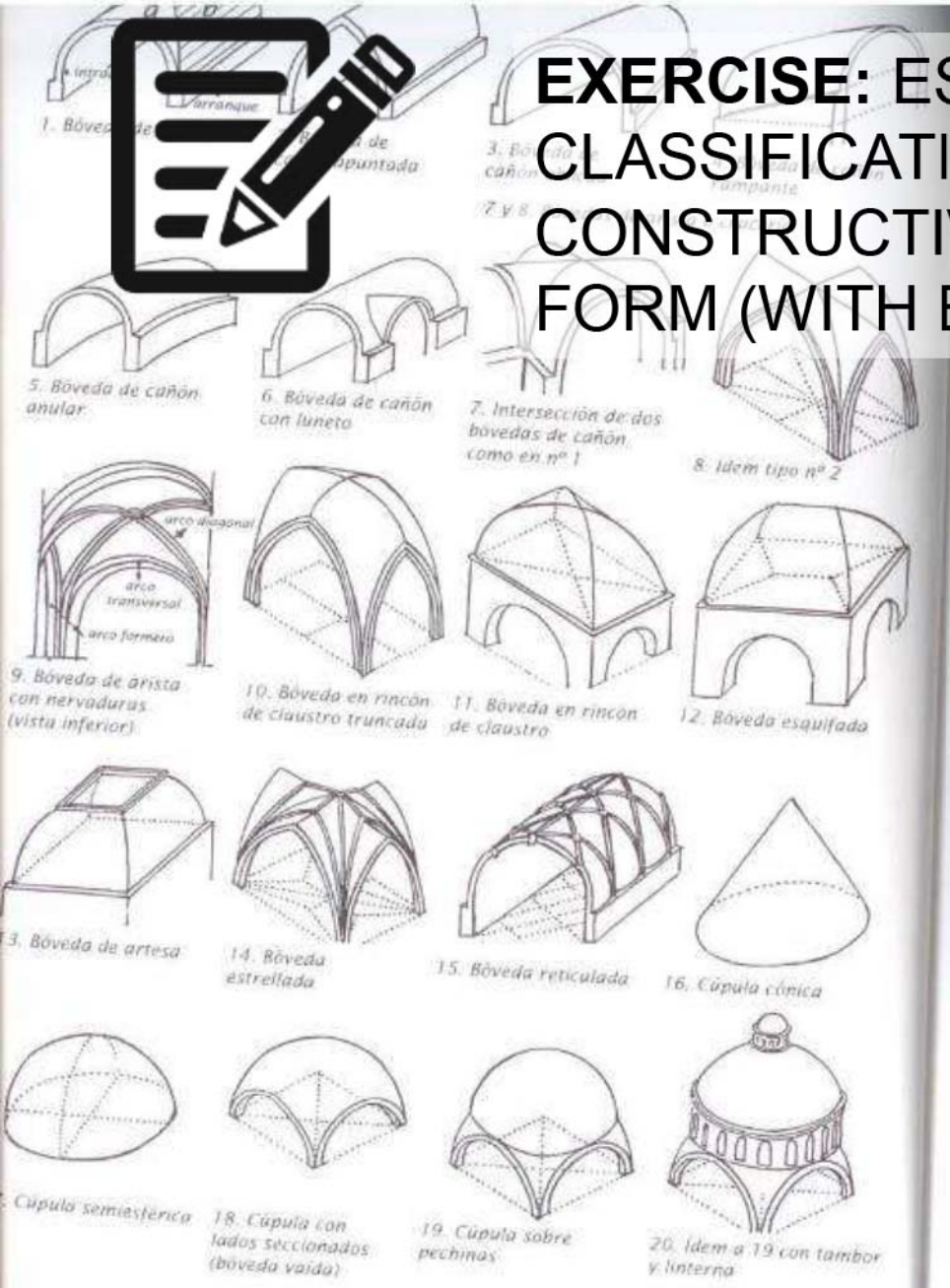


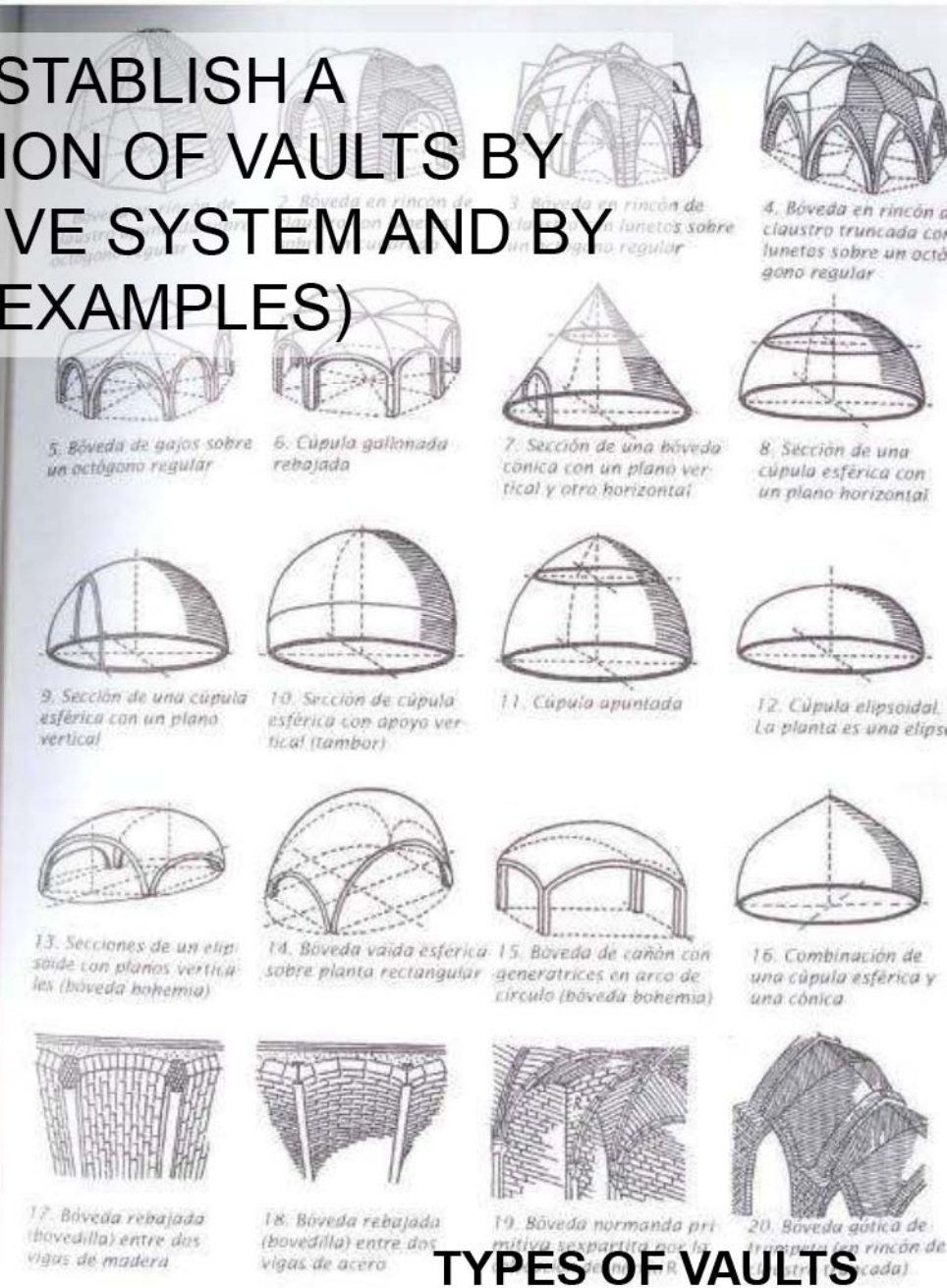
07 VAULTS:
CONSTRUCTIVE SYSTEM

07 VAULTS

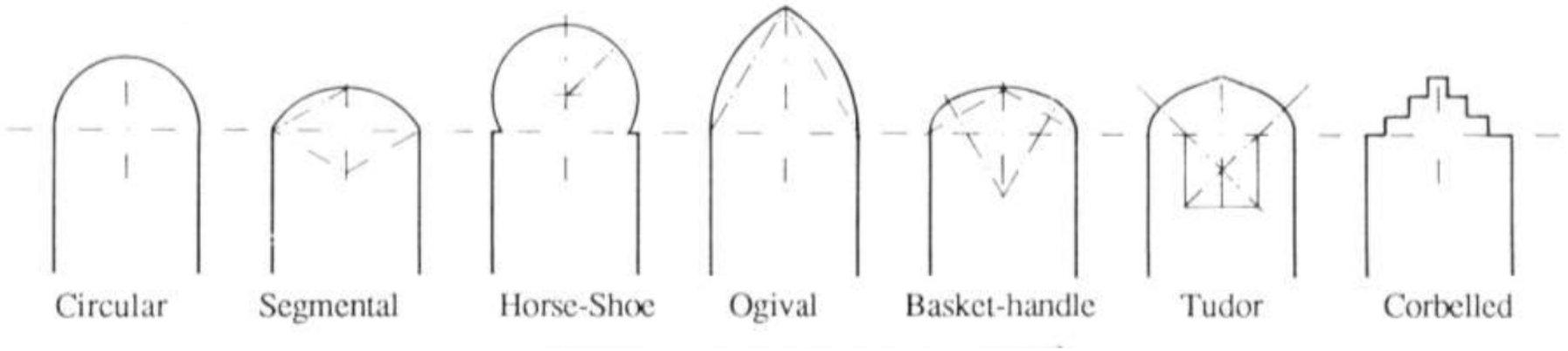
CONSTRUCTIVE SYSTEM

EXERCISE: ESTABLISH A CLASSIFICATION OF VAULTS BY CONSTRUCTIVE SYSTEM AND BY FORM (WITH EXAMPLES)





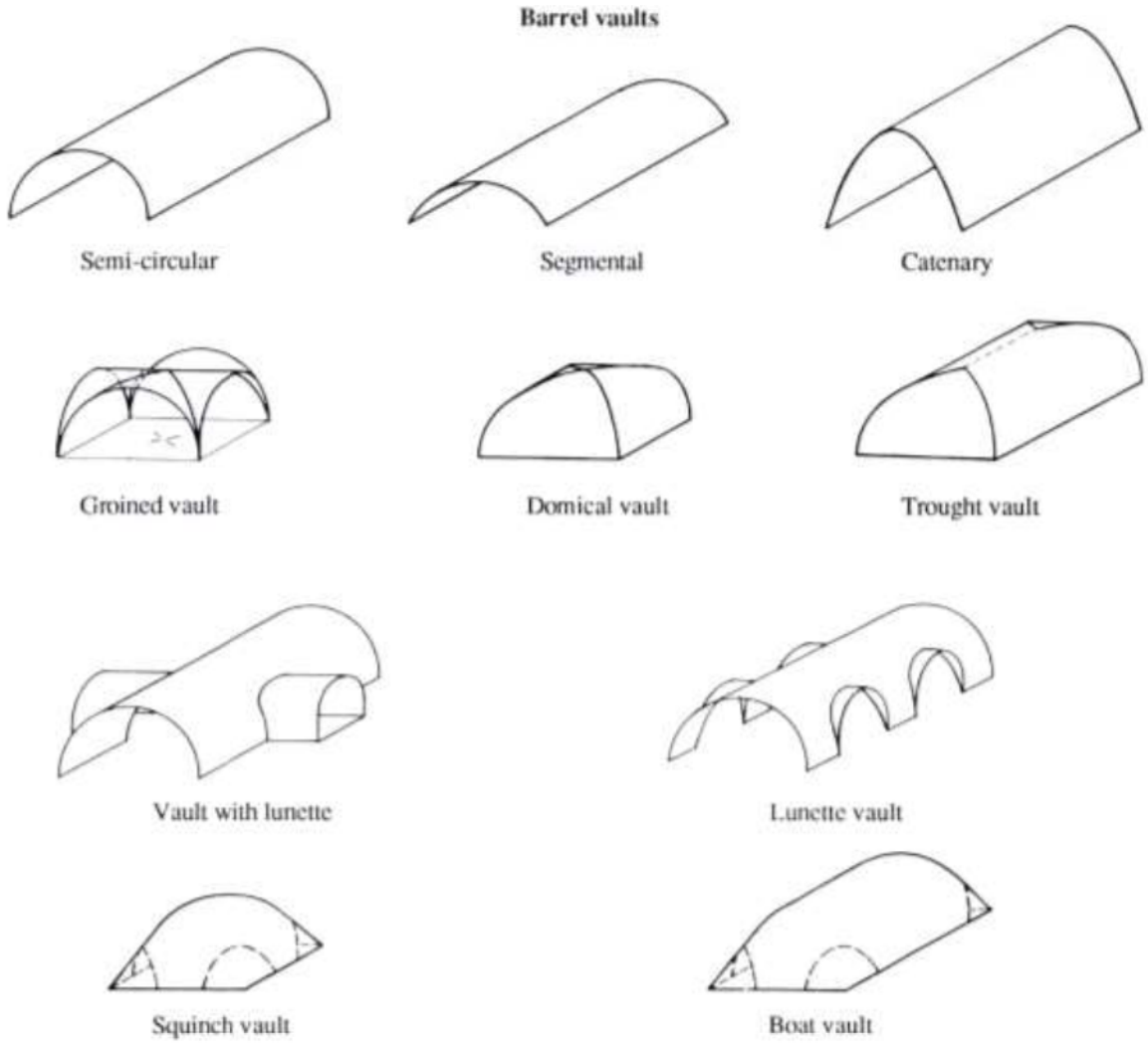
TYPES OF VAULTS



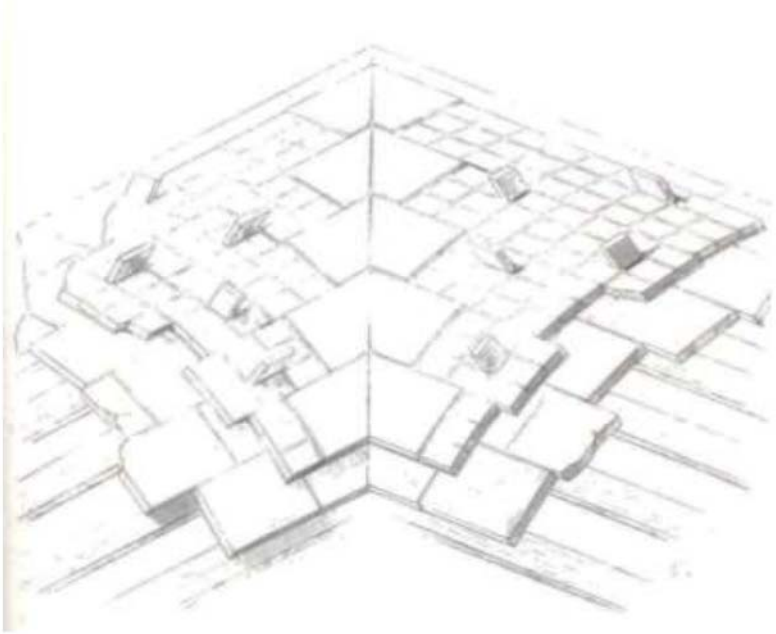
There are many shapes of arches. These are mainly characterized by the curve of the intrados and the ratio of height to span. Most arches are connected to the wall by the extrados. The corbel arch, built using courses gradually jutting further out, and monolithic arches, whether poured, tamped or cut out, have no extrados and continue directly on from the wall.

FORMS OF ARCHES

There are a great many forms of vault. The simplest are barrel vaults which in fact consist of a succession of identical arches. Barrel vaults can have steeper or flatter profiles: semicircular, segmental, ogival, etc. The catenary vault is very common as its form gives maximum stability for a minimum use of material. Combining two barrel vaults with the same profile allows two other types to be defined: the “groined vault” and the “Dominical vault”. By prolonging one of the two barrel vaults, the “Dominical vault” becomes a "trough vault”. Combining barrel vaults with different profiles forms a “lunette vault”.
A “Dominical vault”, the ribs of which are rounded in the form of cones starting from the corners, becomes a "squinch vault”. Similarly the "trough vault" can evolve into a “boat vault”.

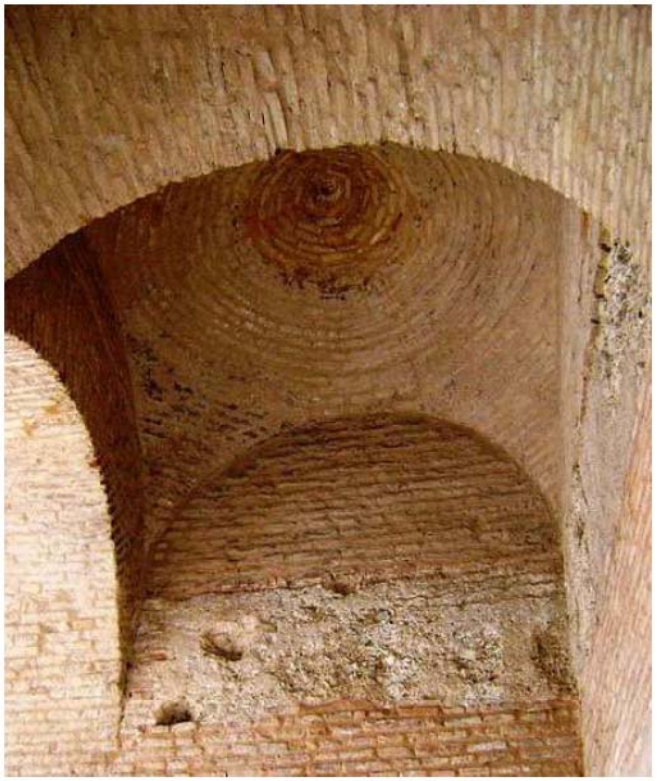


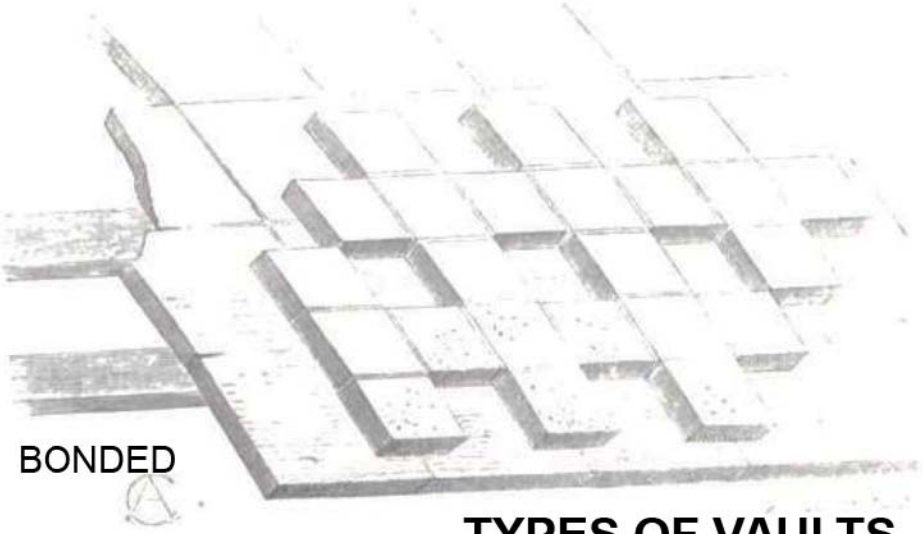
FORM OF VAULTS



POURED

- FORMAL
- CONSTRUCTIVE

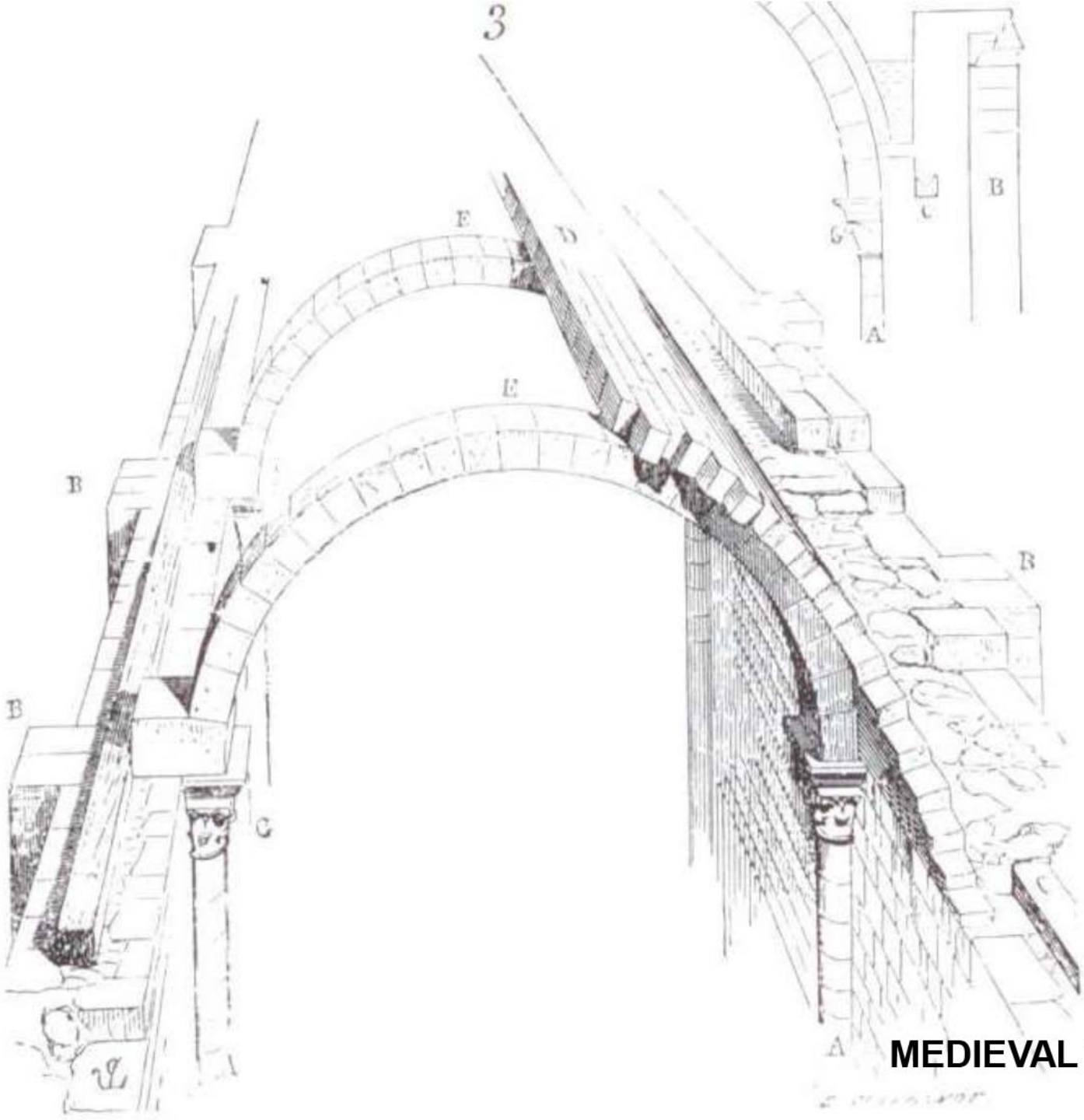




BONDED

TYPES OF VAULTS

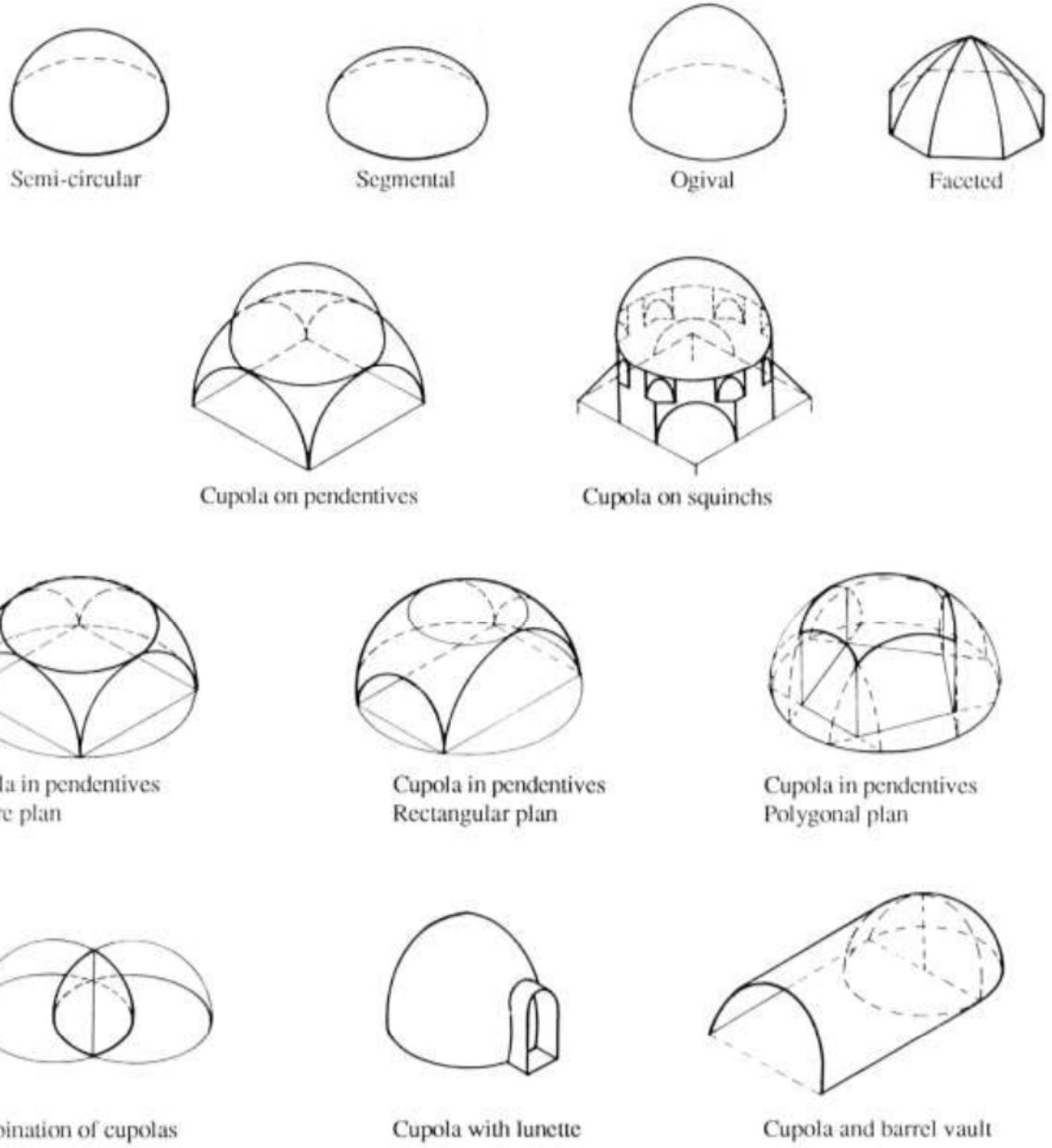
ROMAN VAULT



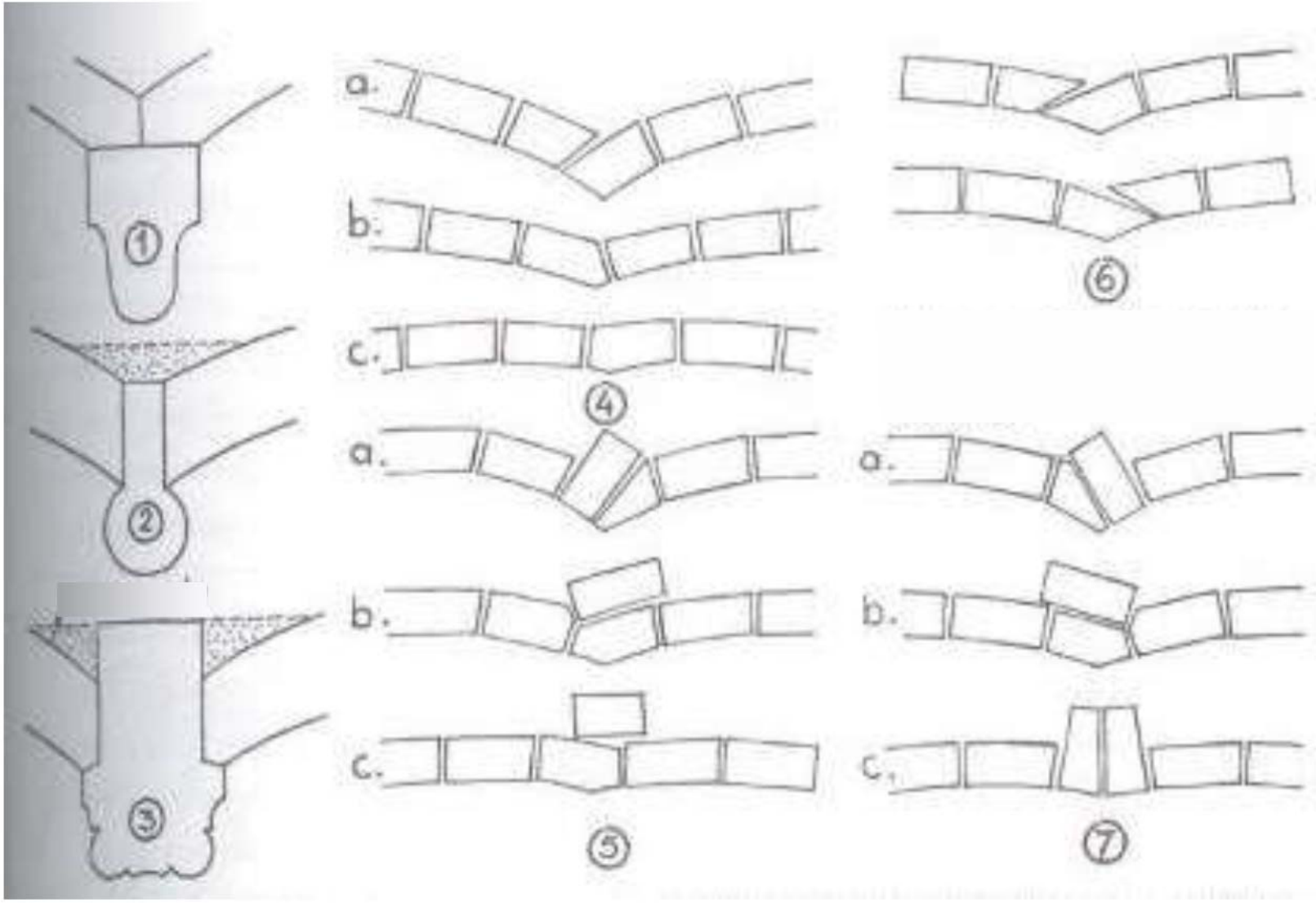
MEDIEVAL VAULT

Domes are obtained by rotating an arch, except for faceted domes which more closely resemble the Dominical vault. A dome can be semi-circular, segmental, ogival, conical, etc.

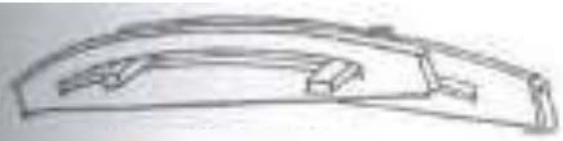
Domes are circular in plan. They can, however, be used to cover square or rectangular rooms by using pendentives or squinches. Domes on pendentives can be used to cover any kind of polygonal shape in plan. It is possible to combine several cupolas or to combine domes with vaults.



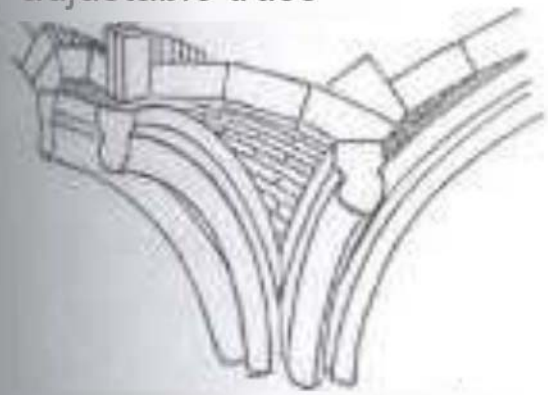
FORMS OF DOMES



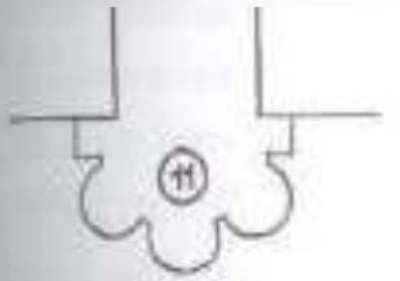
GROIN AND RIB VAULTS. DETAILS OF RIBS

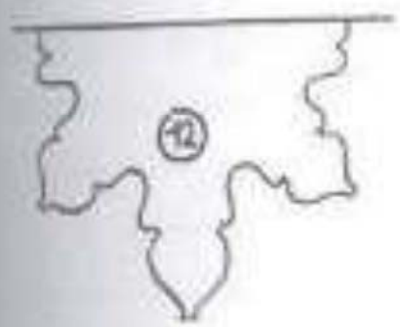


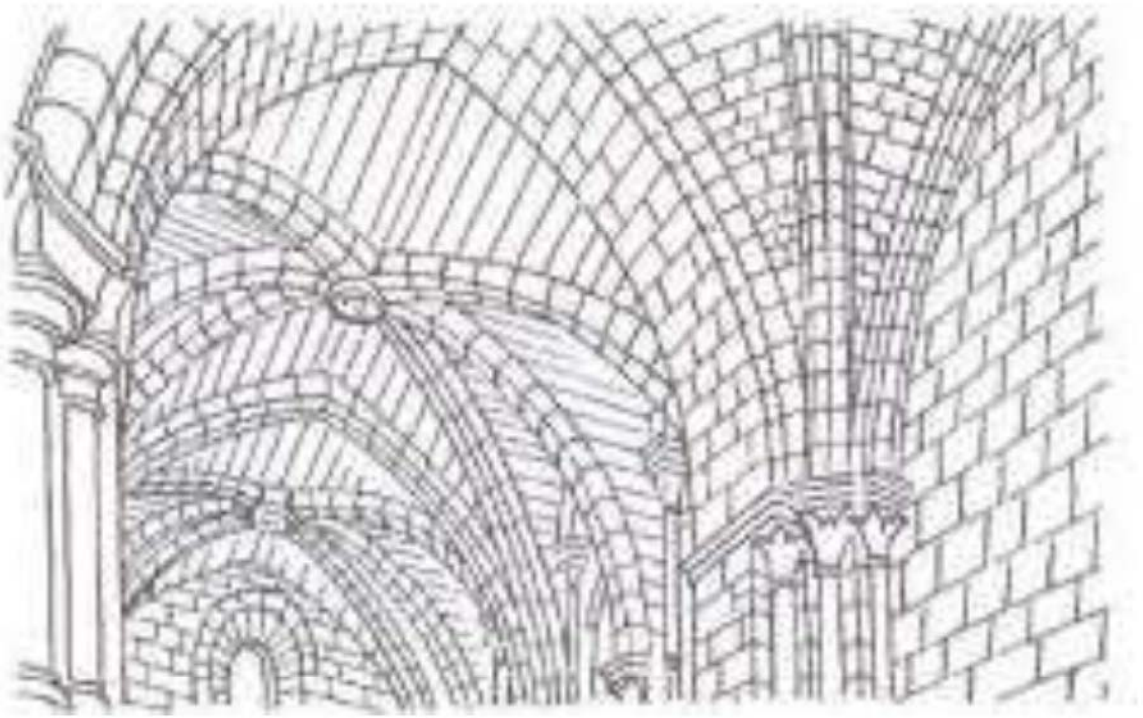
adjustable truss



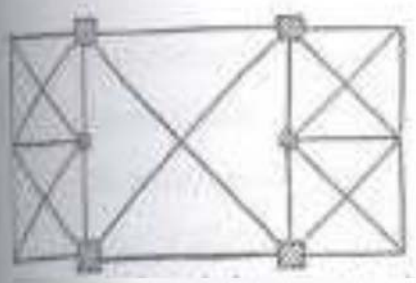
Springing of the vault .
The nerves are
reinforced by the interior



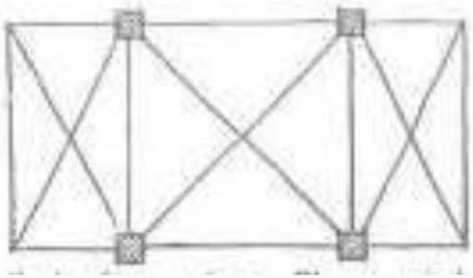




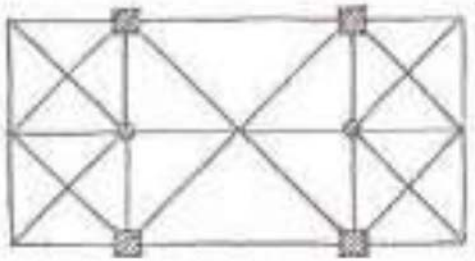
GROIN AND RIB VAULTS. DETAILS OF RIBS



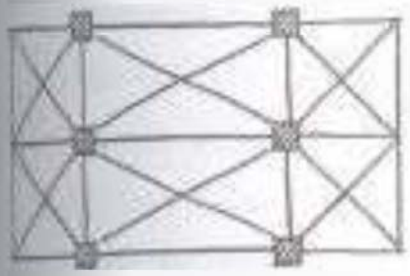
1. Romanesque



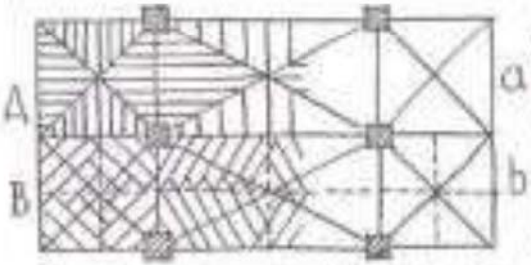
2. Italian (Florence)



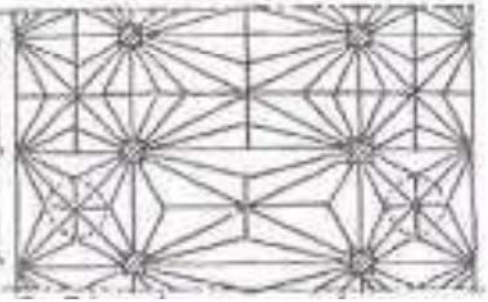
3. Early Gothic



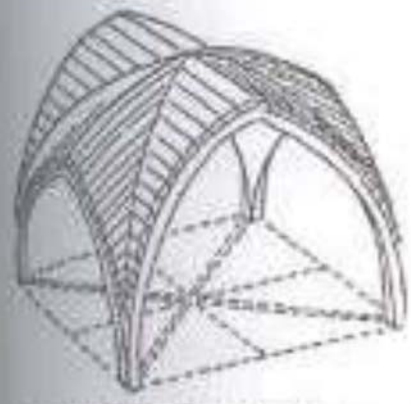
4. High Gothic



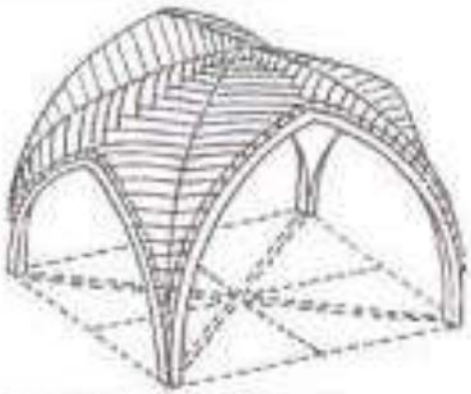
5. Vaulting methods



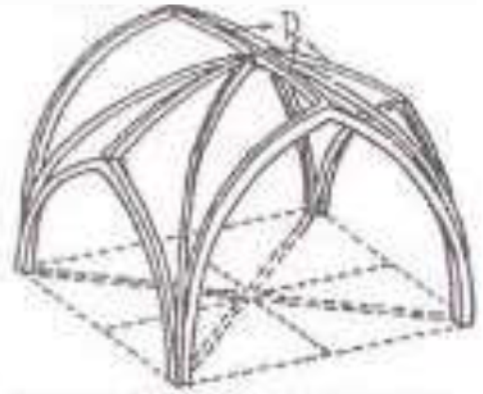
6. English rib vaults



7. French method of vaulting



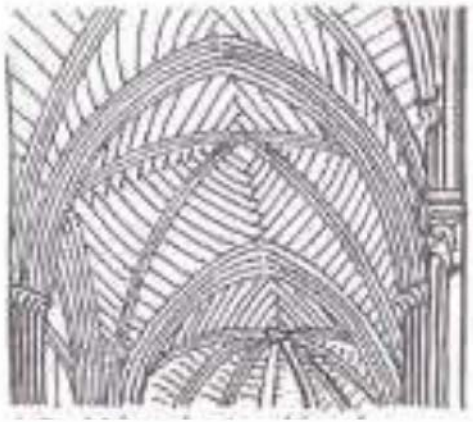
8. English method of vaulting



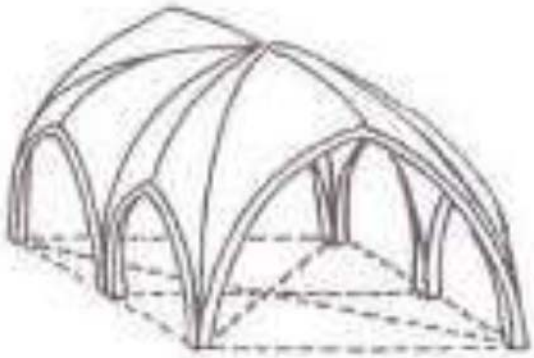
9. Division of the vault by placement of ribs

SYSTEMS OF ROMANESQUE AND GOTHIC VAULTS

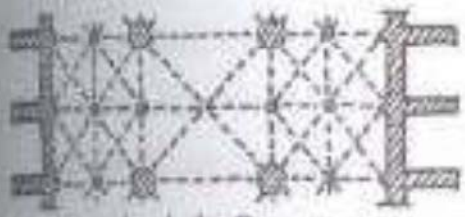
11. French method of vaulting



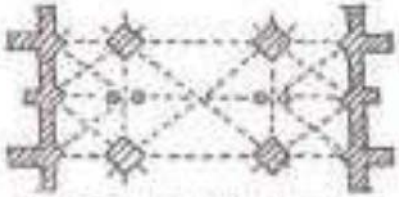
12. English method of vaulting



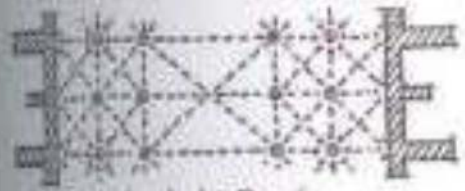
10. Scheme of a sexpartite vault



13. Catedral de Bourges.



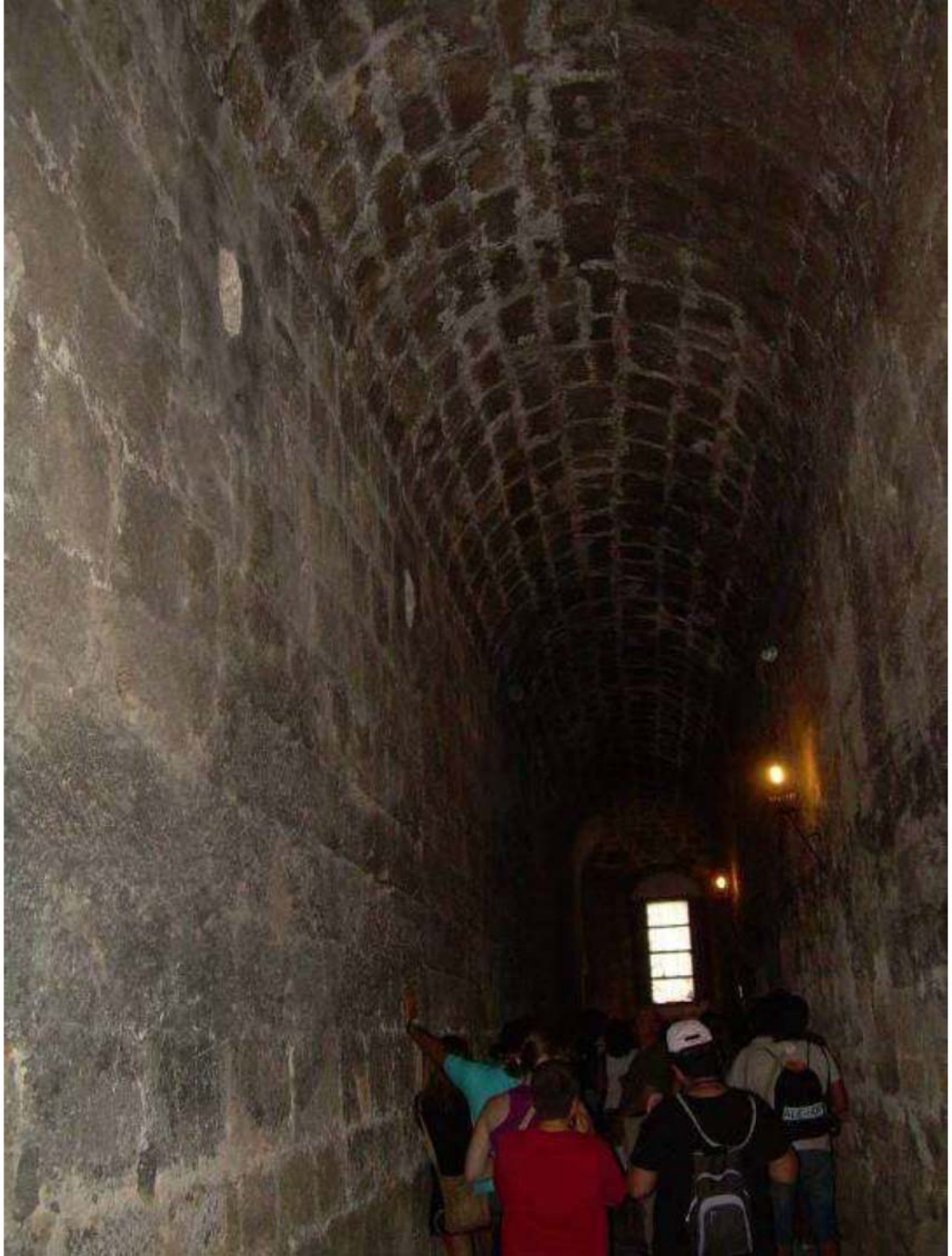
14. Catedral de Sens.



15. Catedral de Paris.

16. Catedral de Laon.

SYSTEMS OF ROMANESQUE AND GOTHIC VAULTS



Monasterio de Piedra
(Zaragoza, Spain)

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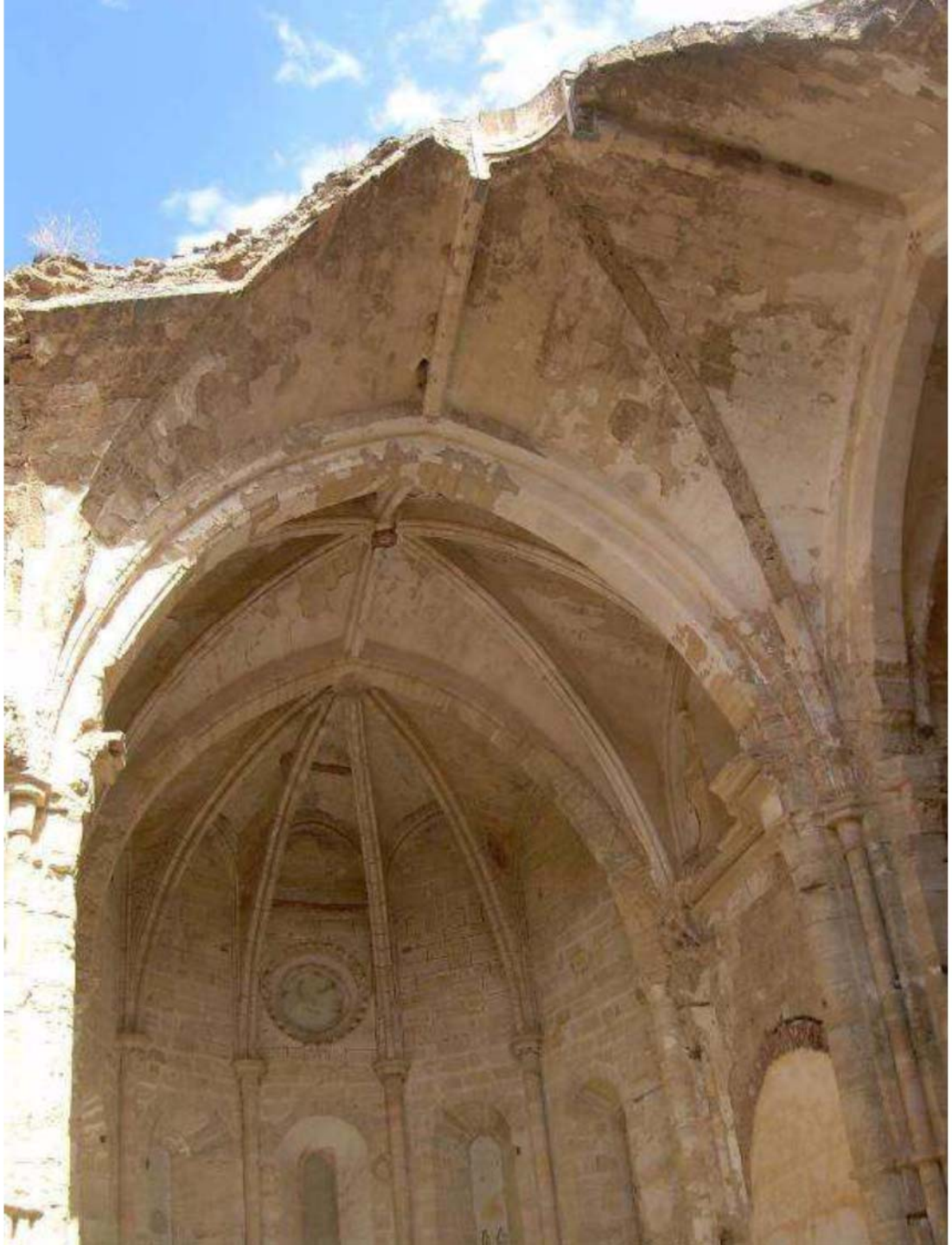
(Zaragoza, Spain)



Monasterio de Piedra
(Zaragoza, Spain)

Monasterio de Retuerta
(Valladolid, Spain)

Santa María la Real de Sasamón
(Burgos, Spain)

Monasterio de Moreruela
(Zamora, Spain)

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(Zamora, Spain)

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