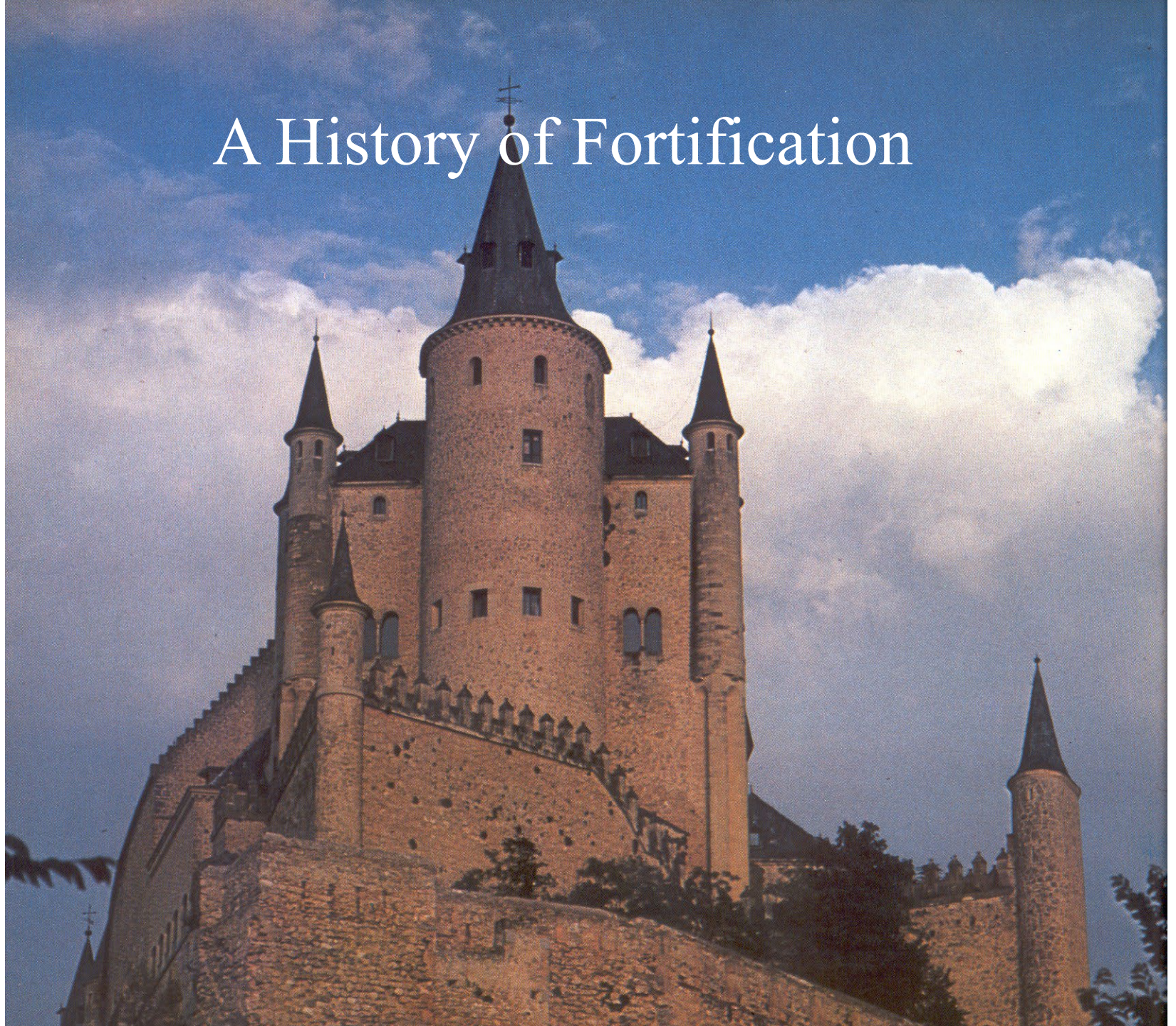
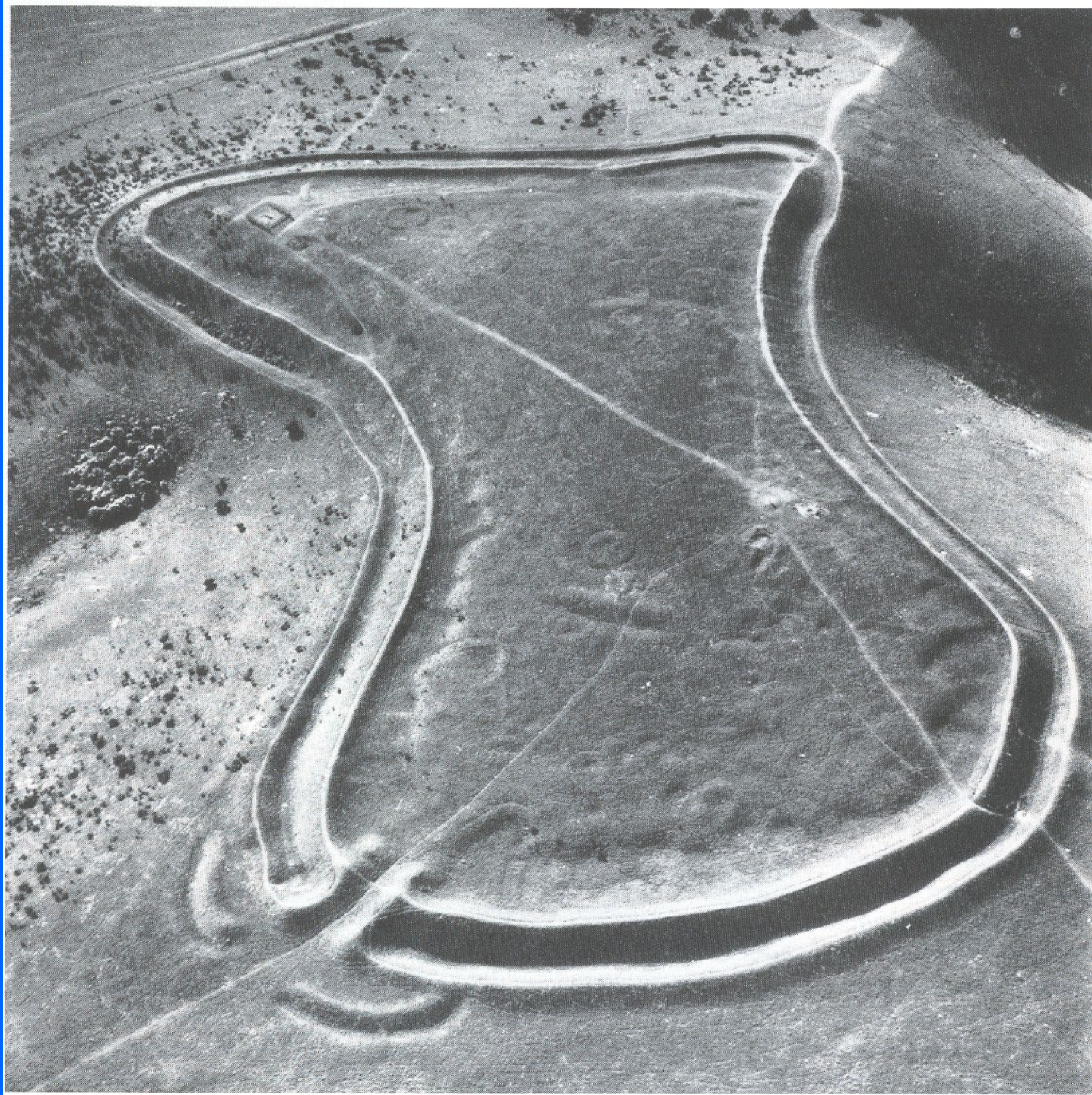


A History of Fortification

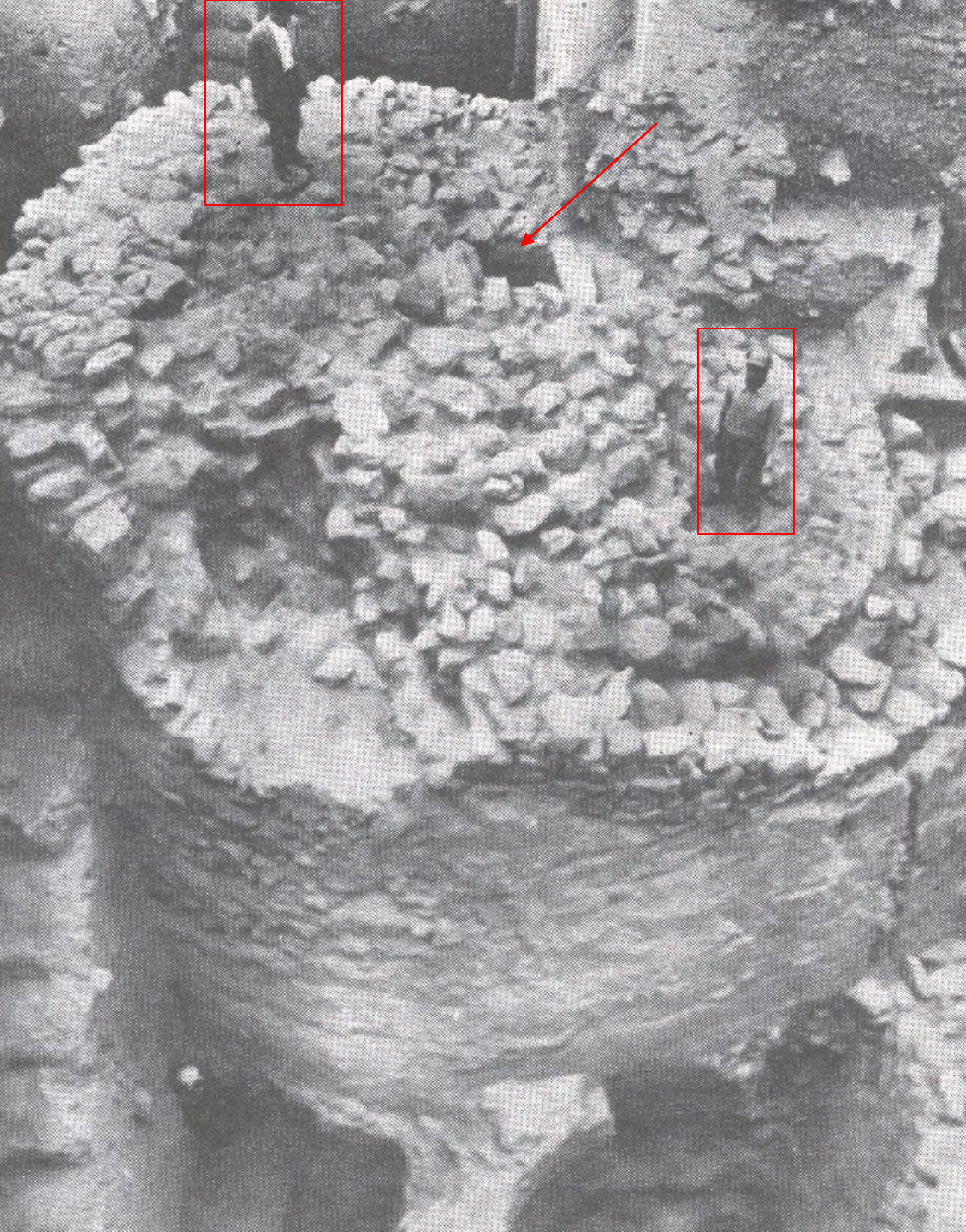


Elements of Defense:

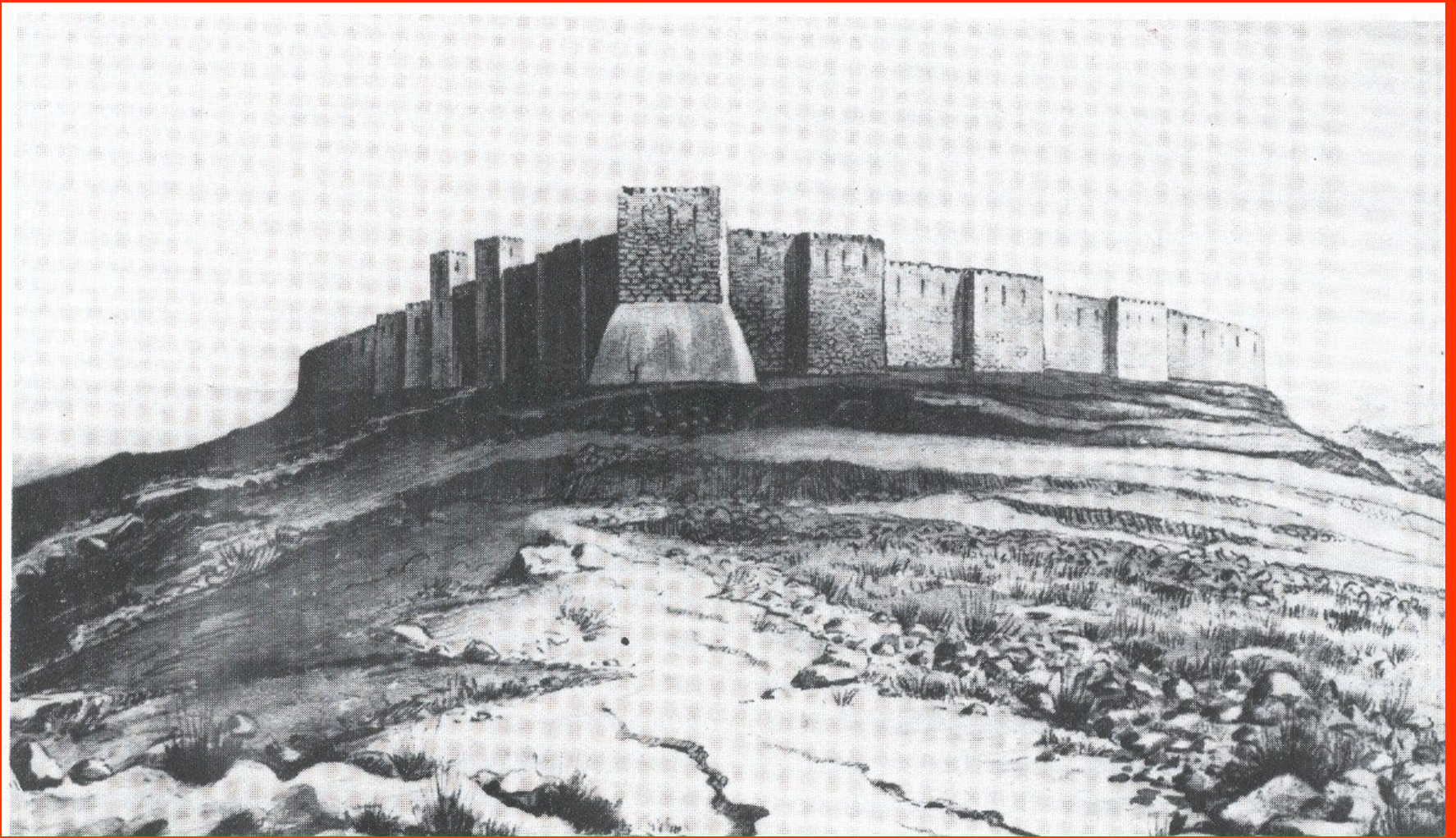
- Walls
- Ditches
- Elevation
- Restricted Access (Passes, narrows, and water features)



Ancient Hill Fort



The Dawn of Masonry
Fortification: Jericho,
7000 B.C.E.

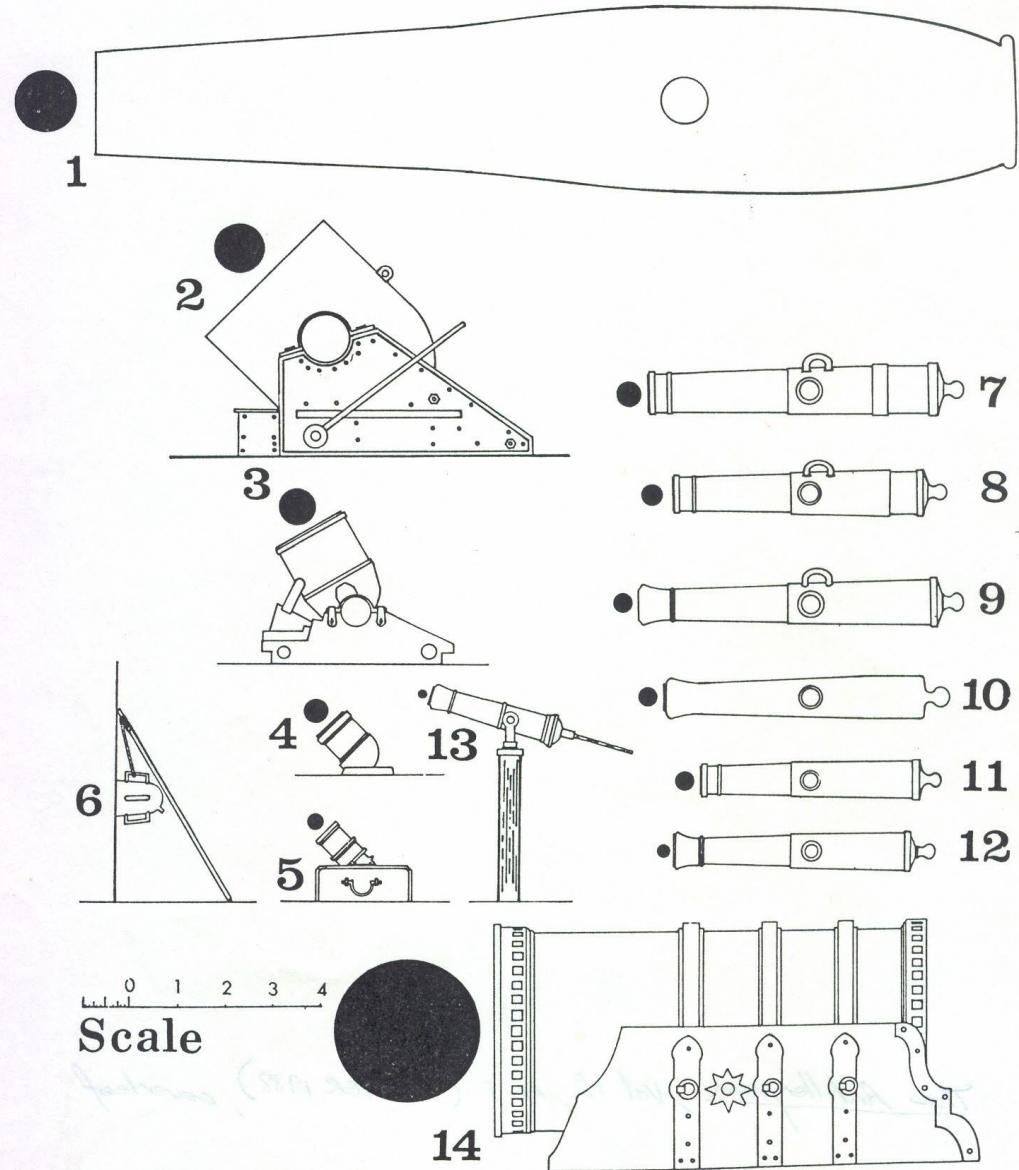


Ancient Mizpah (Artist's Reconstruction)

“The Great Leveler” :
 Gunpowder and
 Cannon, 1180-1865

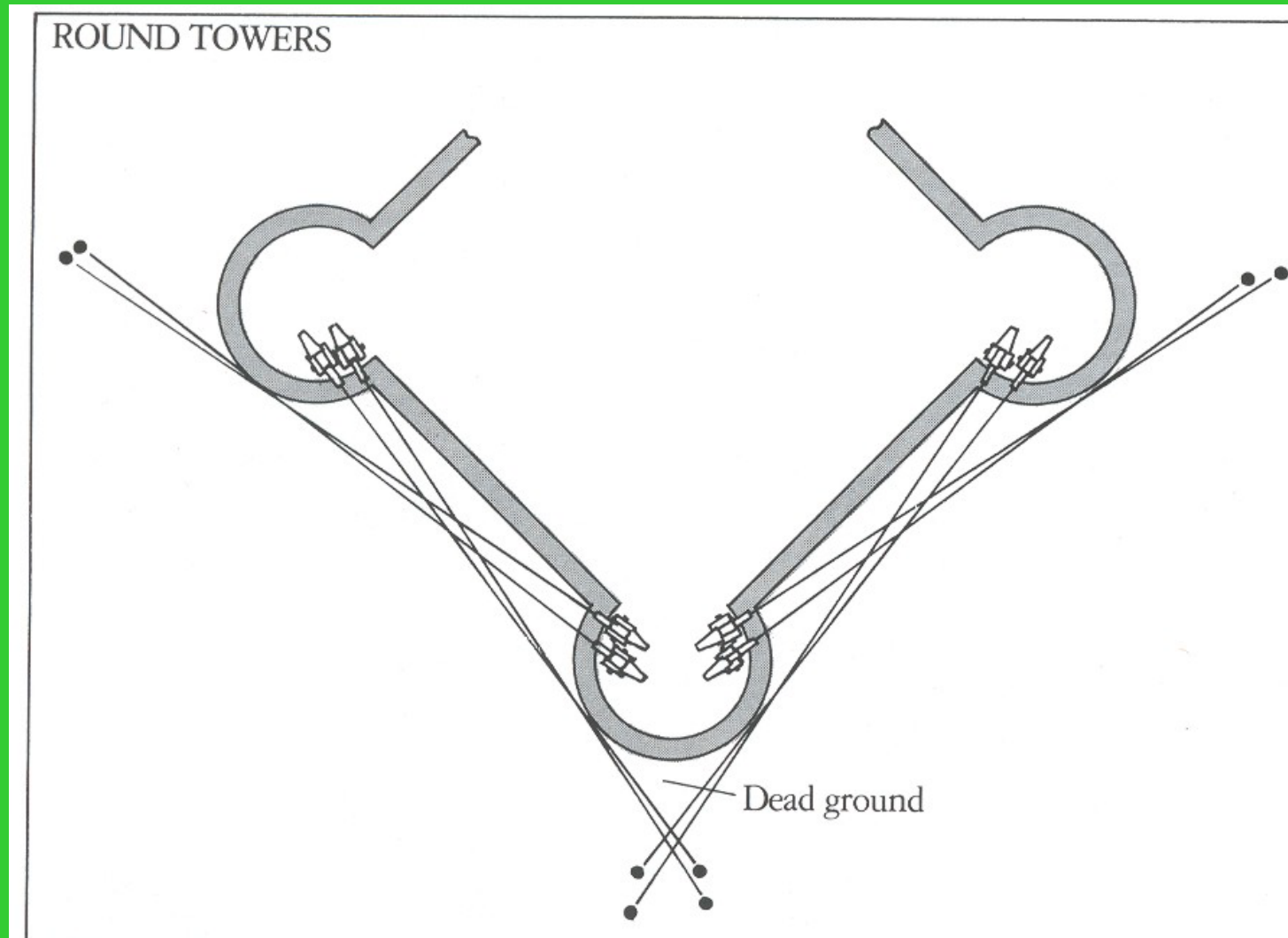
Artillery---Definitions and Descriptions

By Robert A. Howard, Hagley Museum, Wilmington, DE

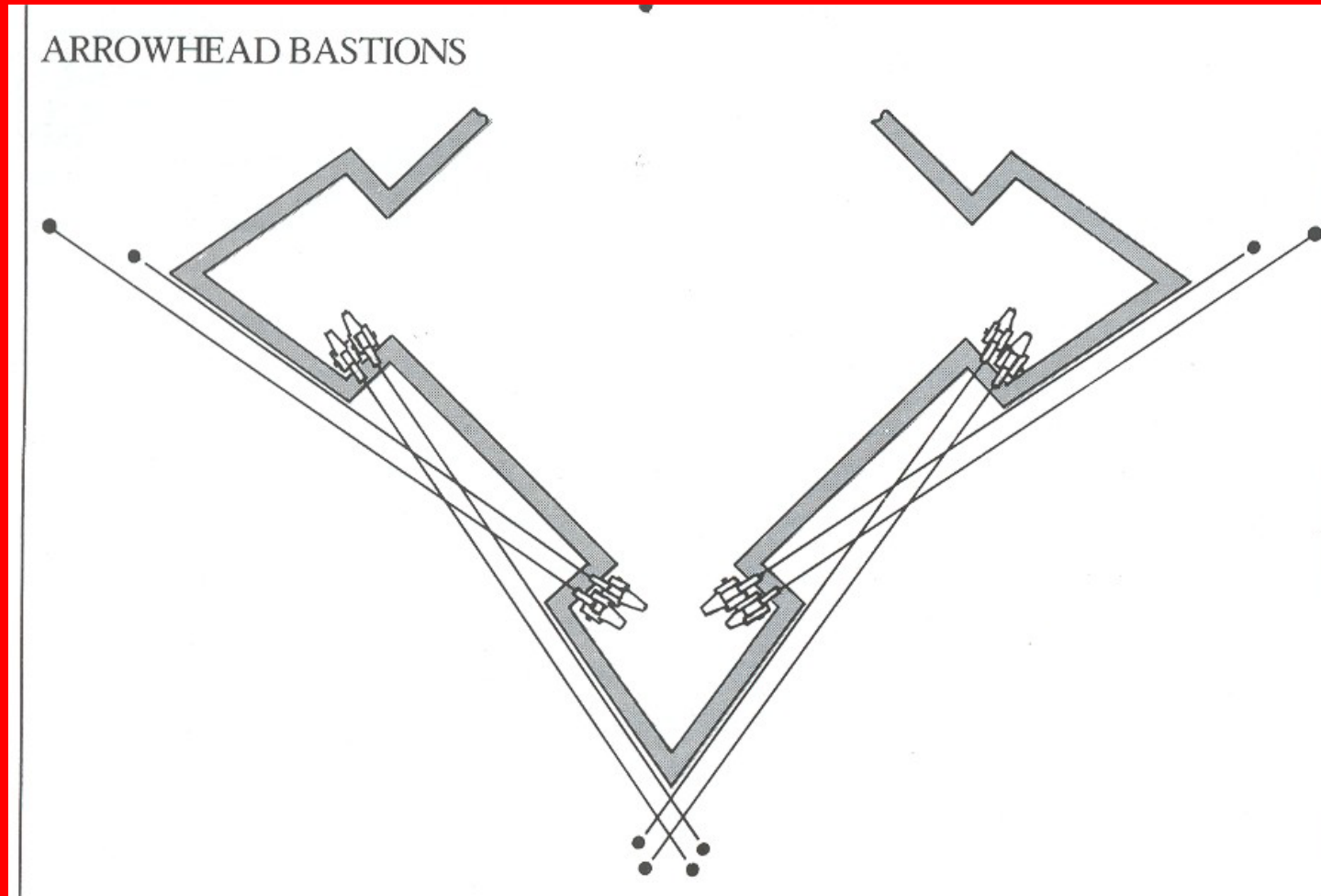


Comparative sizes of mid-19th Century artillery and their ammunition (1) 15-inch Rodman Columbiad (2) 13-inch Seacoast Defense Mortar, 1861 (3) 10- Inch Siege Mortar, 1841 (4) 24 pdr. Eprouvette Mortar (5) 12 pdr. Coehorn Mortar (6) Petard (7) 32 pdr. Howitzer (8) 24 pdr. Field Howitzer (9) 12 pdr. Field Gun, 1841 (10) 12 pdr. Napoleon, 1857 (11) 12 pdr. Field Gun, 1841 (12) 6 pdr. Field Gun, 1841 (13) Swivel Gun (14) Great Gun of Moscow.
 (Photo repro work by Charles Foote, Hagley Museum)

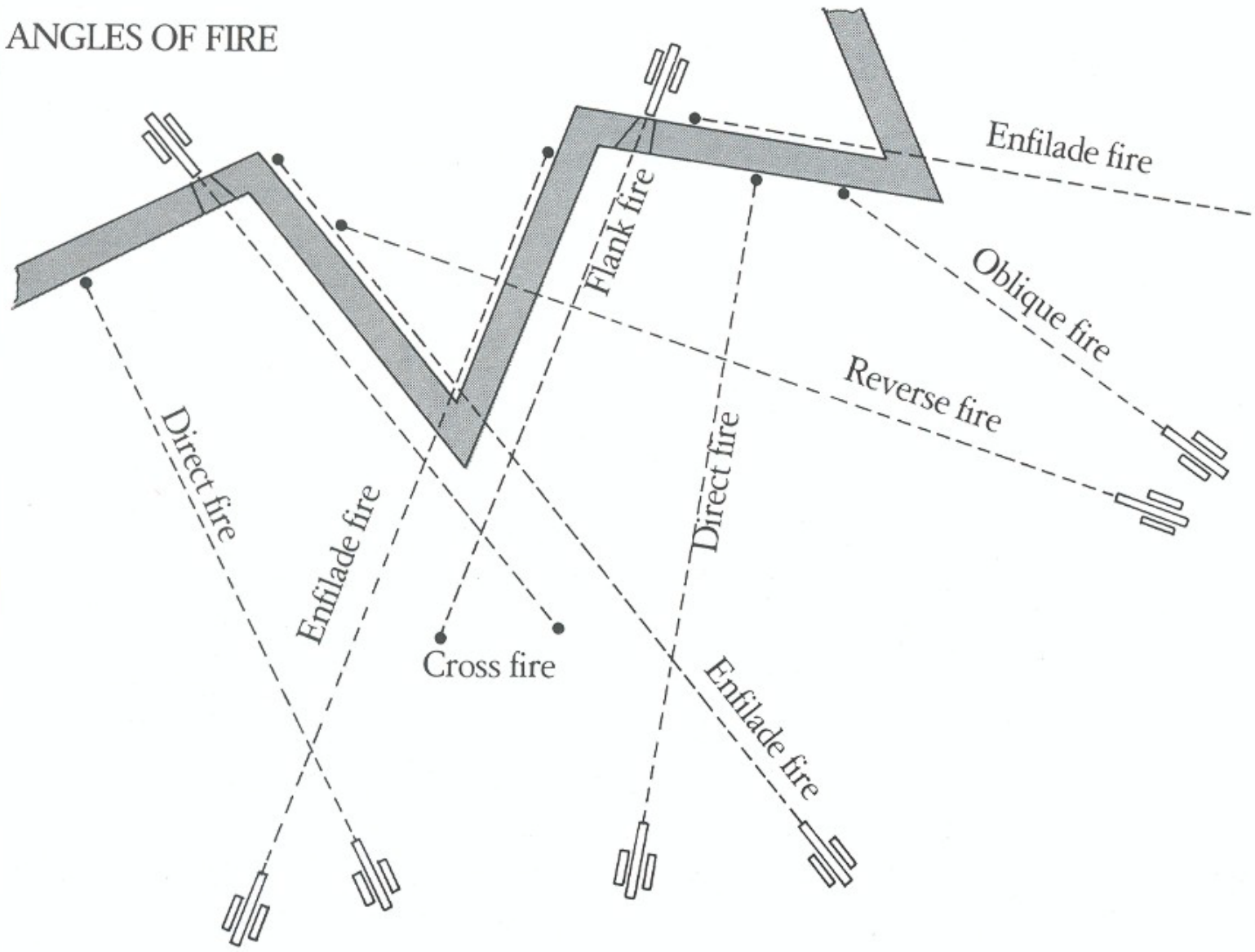
The Problem with Round Towers



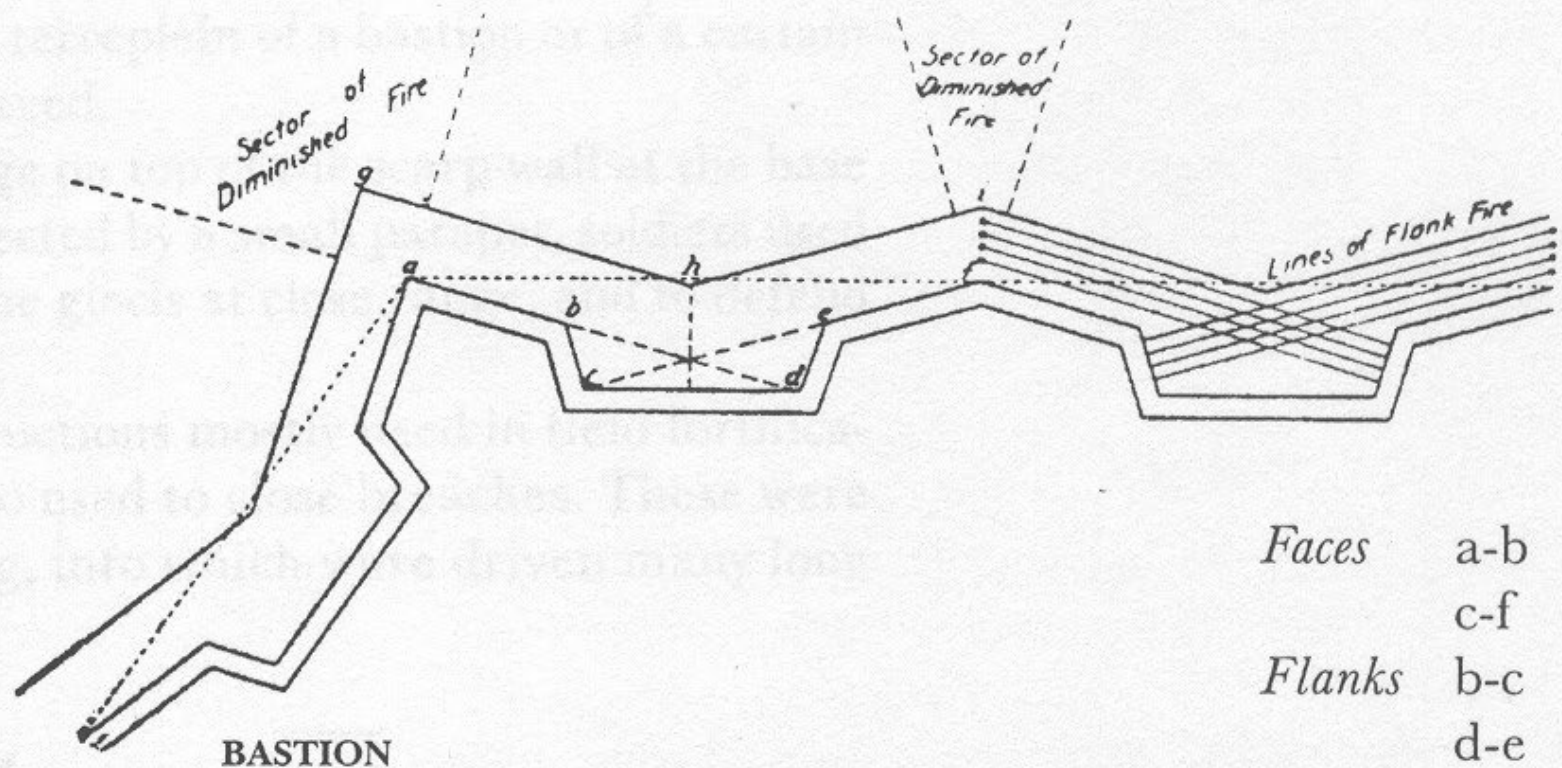
The Solution: Design for Cannon



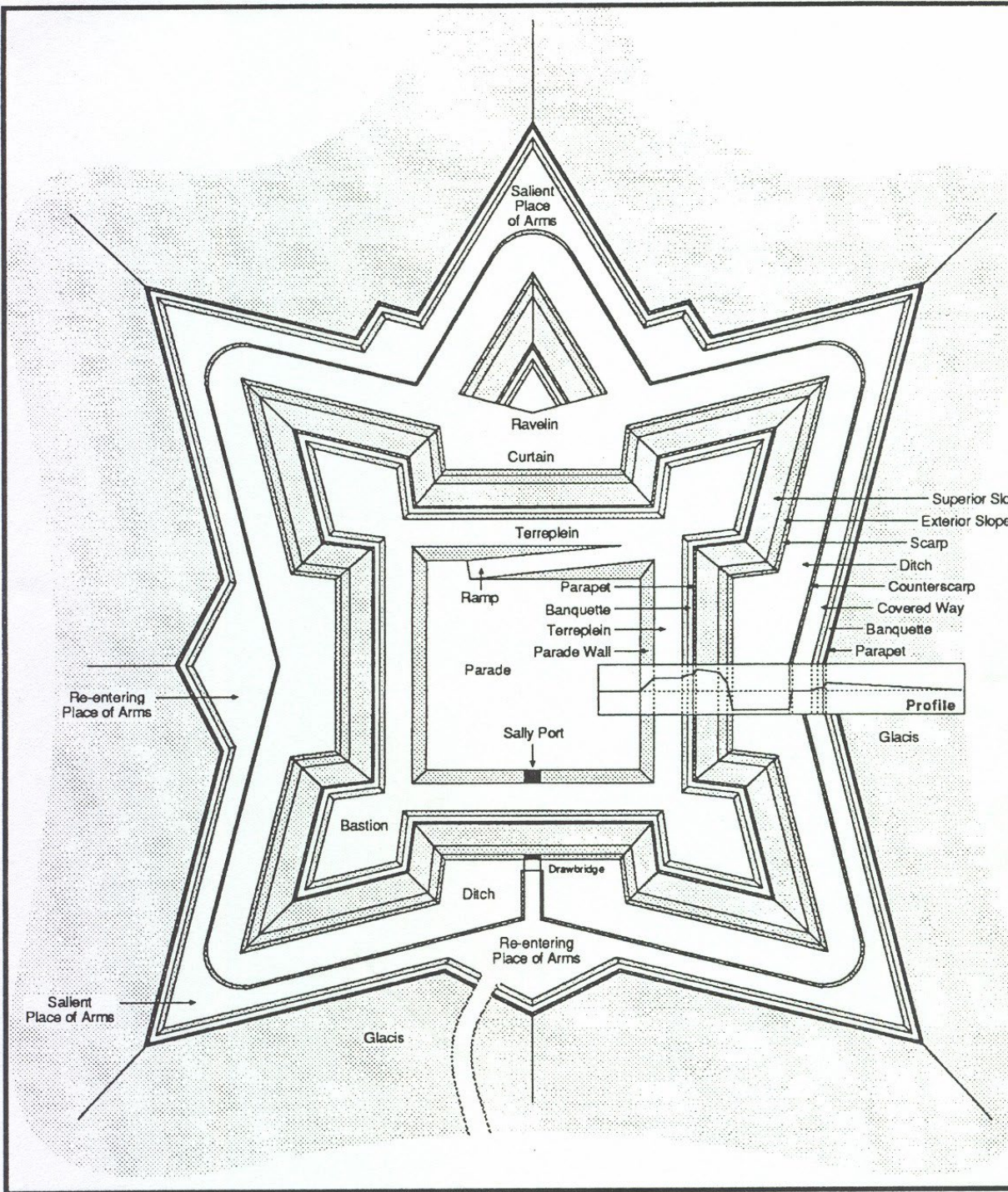
ANGLES OF FIRE



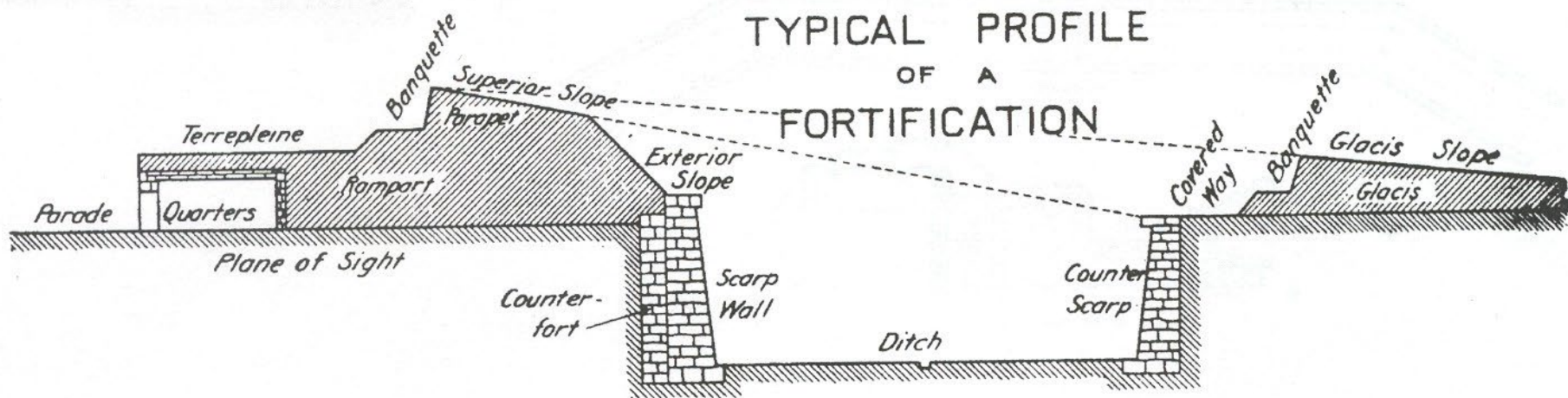
Bastion. A four-sided projection from the main rampart in an enceinte of a fortress, consisting of two faces and two flanks.

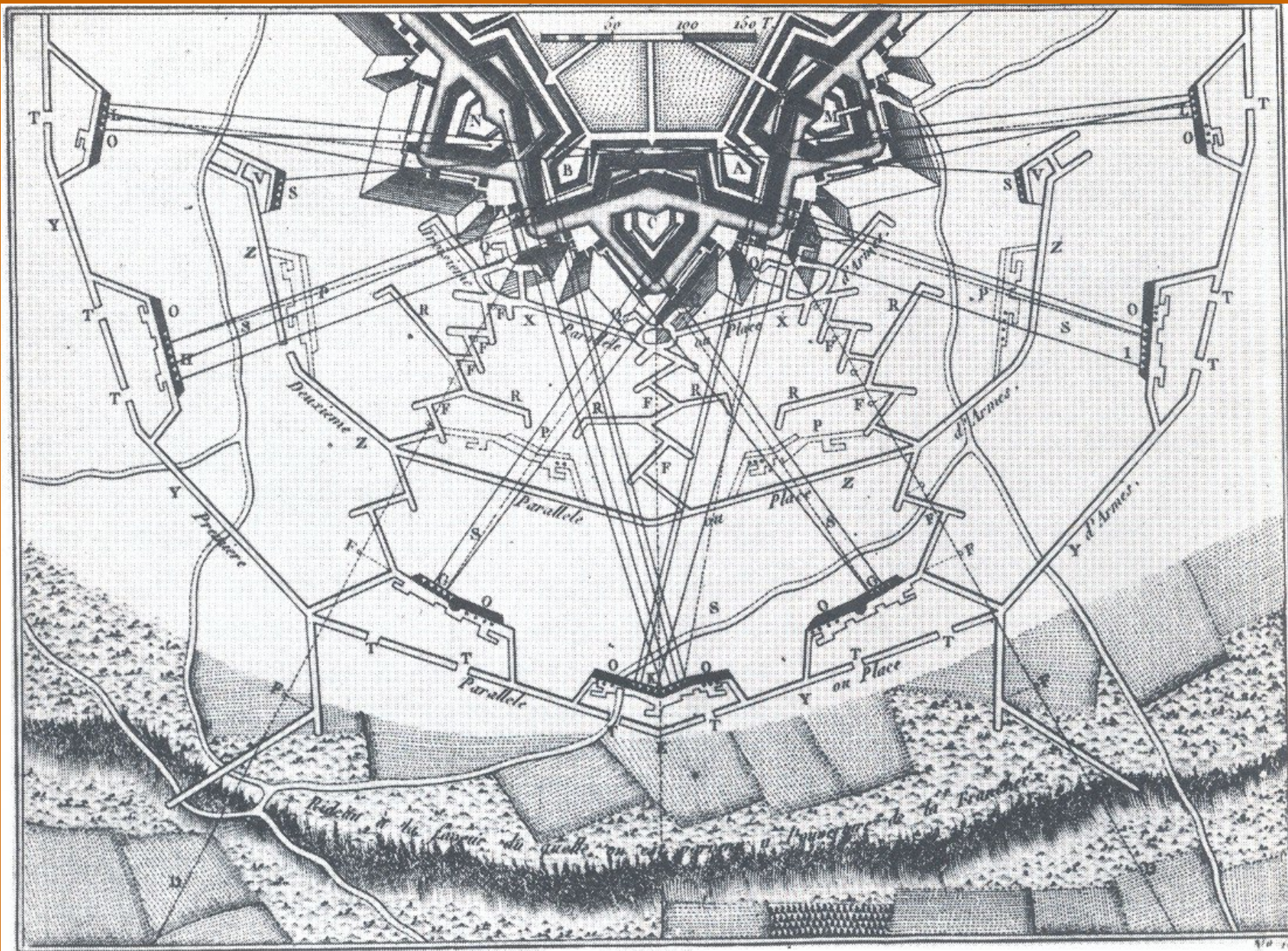


Vaubon: The Master of the Bastioned Fort



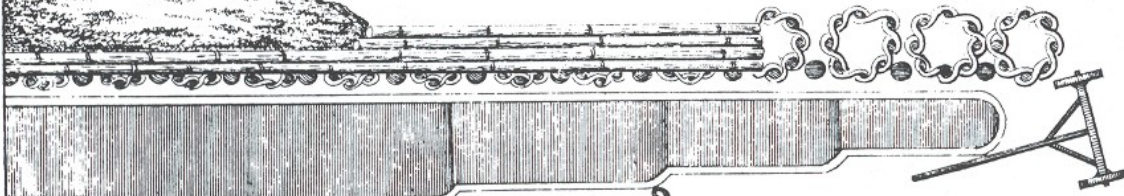
TYPICAL PROFILE OF A FORTIFICATION



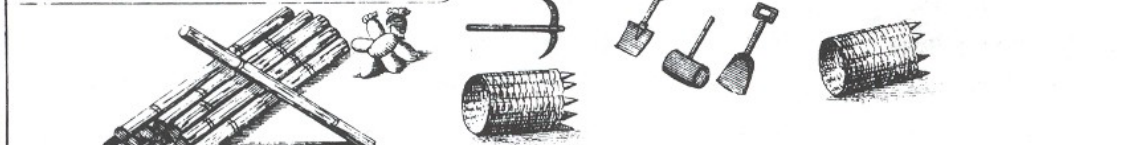


Sappers

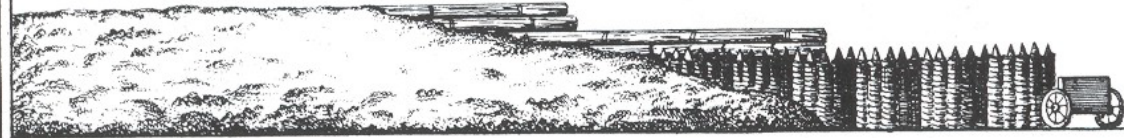
Plan of a Sap



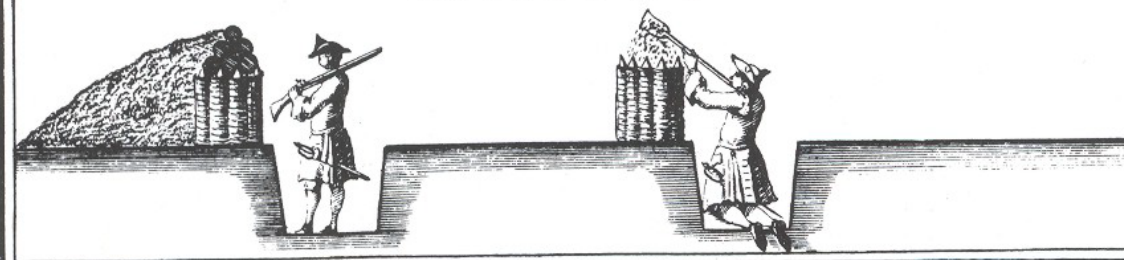
Front of a Sap



Back of a Sap .



Sections .



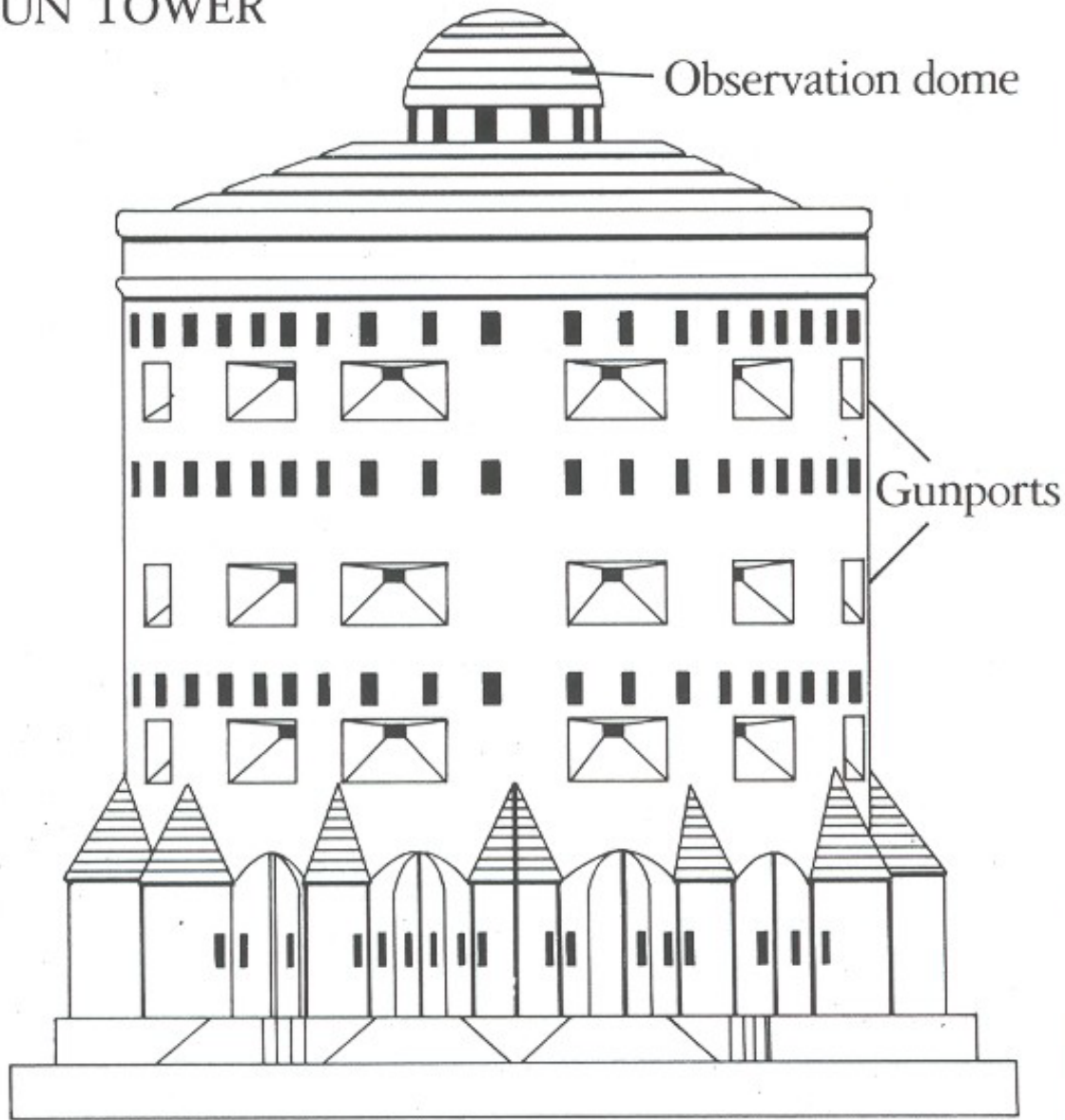
Vertical view

View from behind

Enemy's view

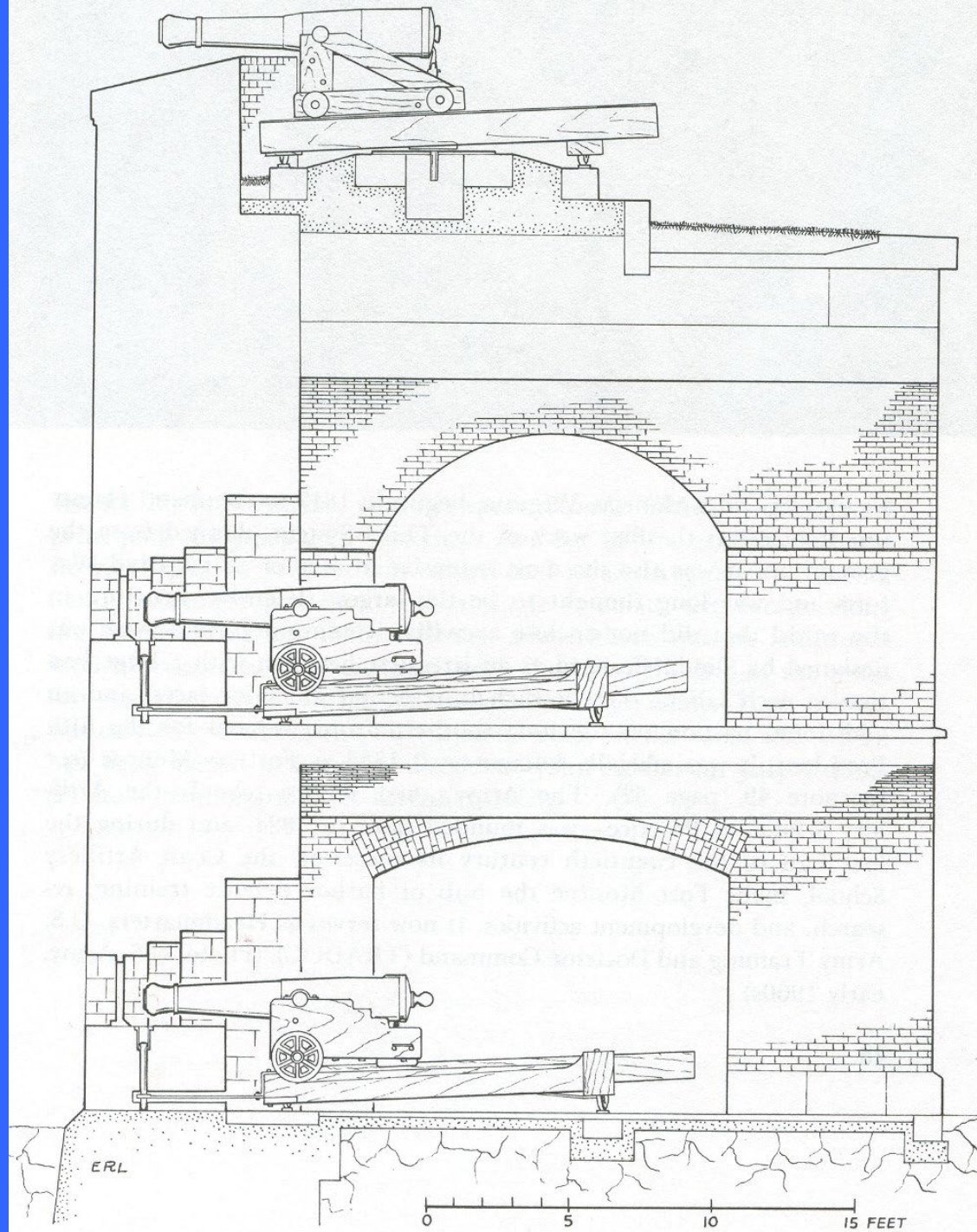
Cross section

MONTALEMBERT'S MULTI-LAYERED GUN TOWER



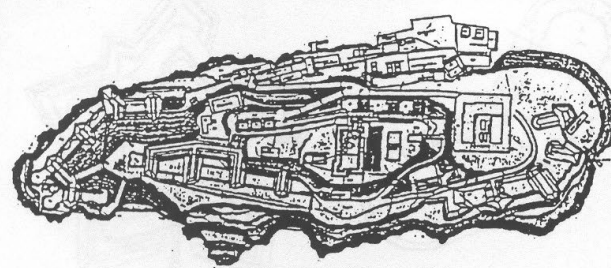
Montalembert tackles the concentration of fire problem

Profile of a Casemated Wall in Three Tiers (such as Fort McRee)

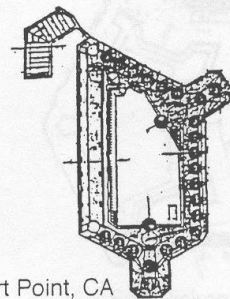


From E. R. Lewis, Seacoast Fortifications of the United States

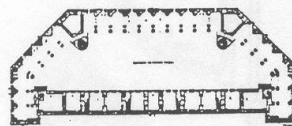
The Third System of U.S. Seacoast Fortifications, 1817-1870



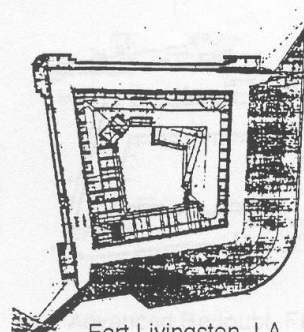
Alcatraz Island, CA



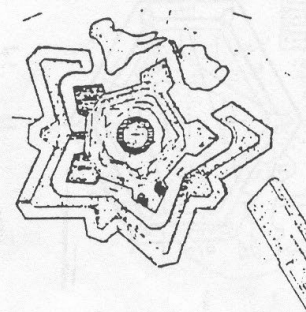
Fort Point, CA



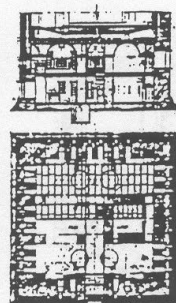
Pelican Spit, TX



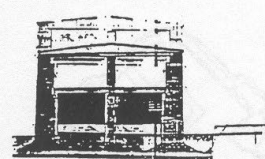
Fort Livingston, LA



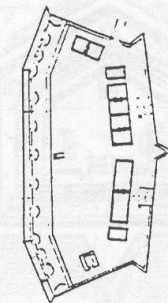
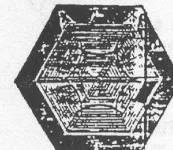
Fort Jackson, LA



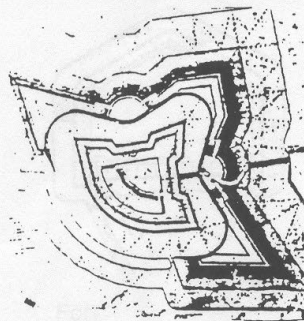
Proctor's Tower, LA



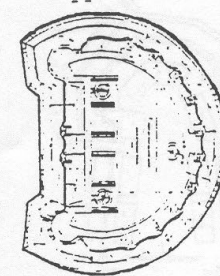
Tower Dupre, LA



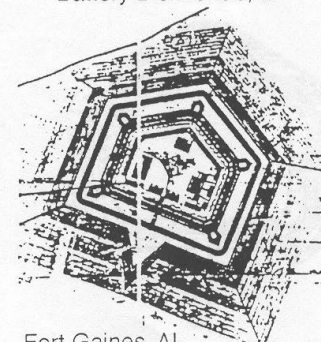
Battery Bienvenue, LA



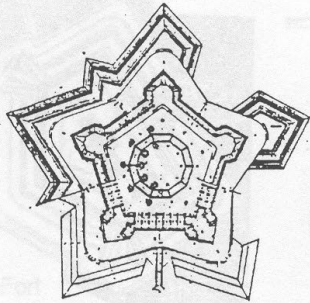
Forts Macomb & Pike, LA



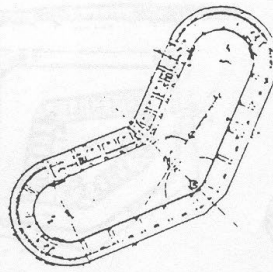
Fort Massachusetts, MS



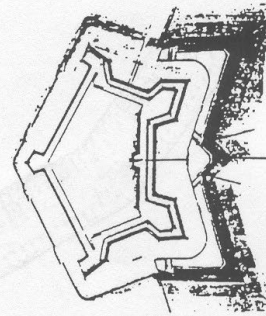
Fort Gaines, AL



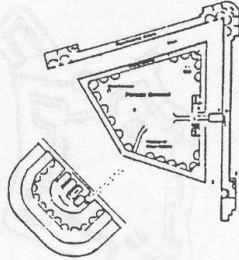
Fort Morgan, AL



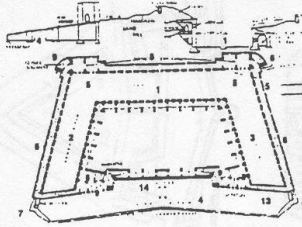
Fort McRee, FL



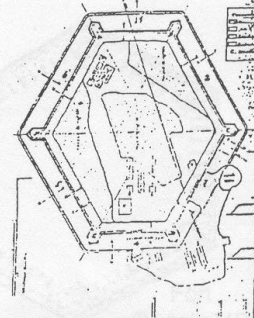
Fort Pickens, FL



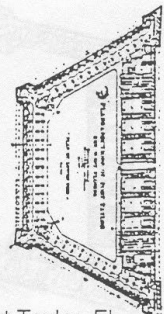
Fort Barrancas, FL



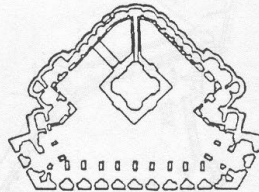
Advanced Redoubt, FL



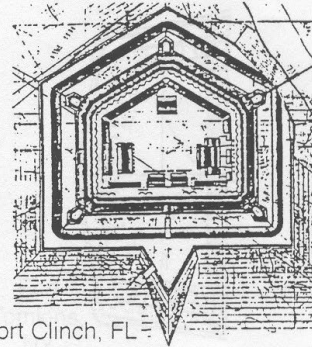
Fort Jefferson, FL



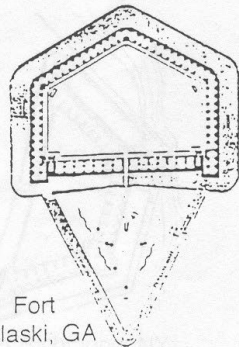
Fort Taylor, FL



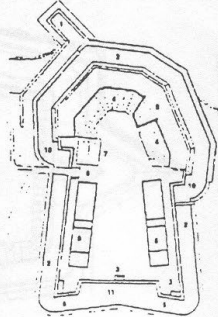
West and East
Martello Towers, FL



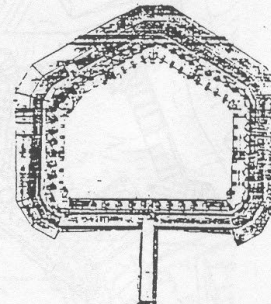
Fort Clinch, FL



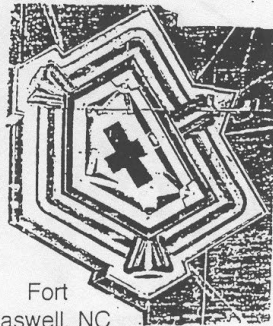
Fort
Pulaski, GA



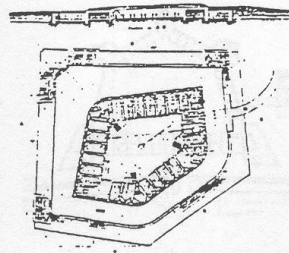
Fort James Jackson, GA



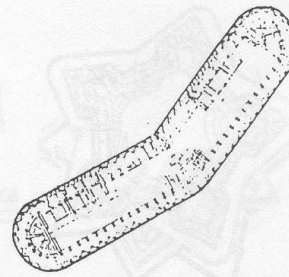
Fort Sumter, SC



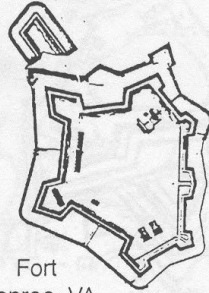
Fort Caswell, NC



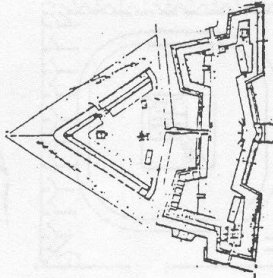
Fort Macon, NC



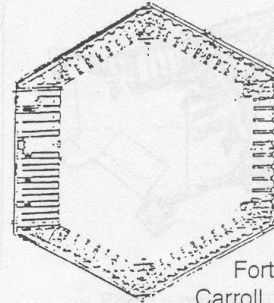
Fort Wool, VA



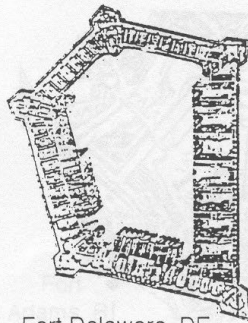
Fort Monroe, VA



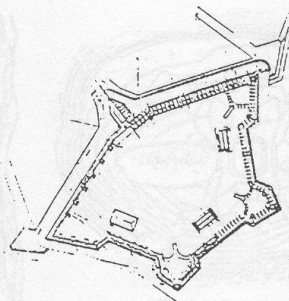
Fort Washington, MD



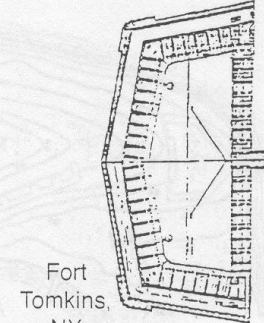
Fort Carroll, MD



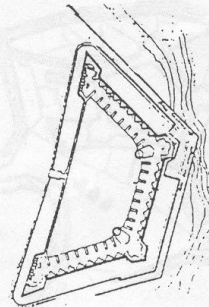
Fort Delaware, DE



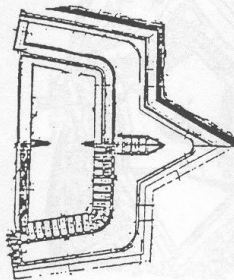
Fort at Sandy Hook, NJ



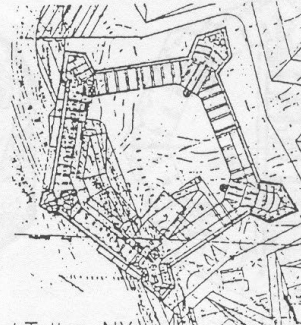
Fort Tomkins, NY



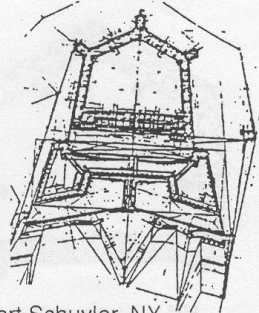
Fort Richmond, NY



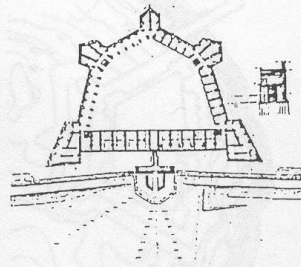
Fort Hamilton, NY



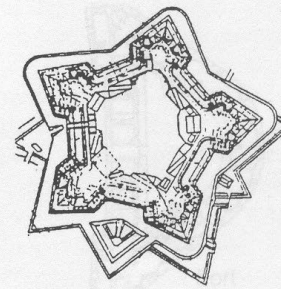
Fort Totten, NY



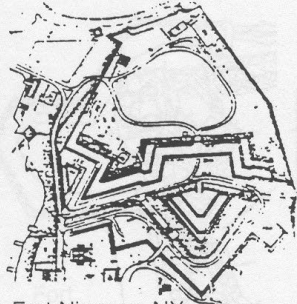
Fort Schuyler, NY



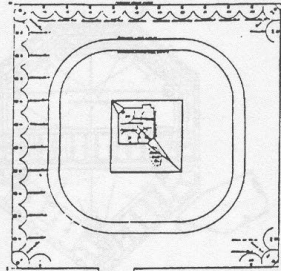
Fort Montgomery, NY



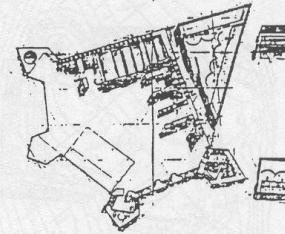
Fort Ontario, NY



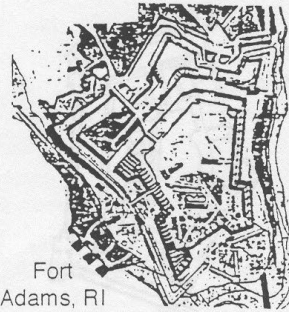
Fort Niagara, NY



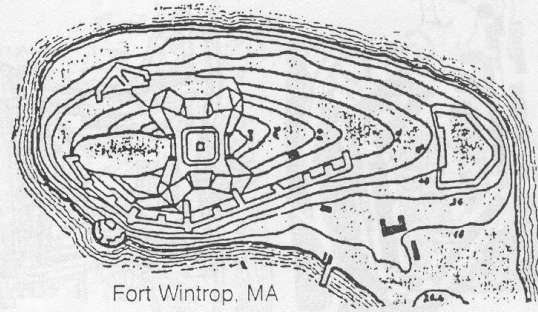
Fort Porter, NY



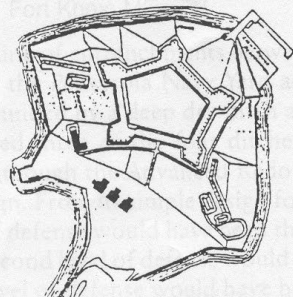
Fort Trumbull, CT



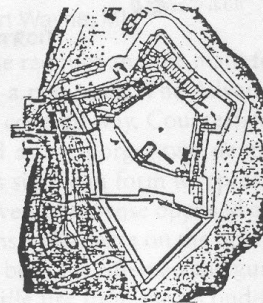
Fort Adams, RI



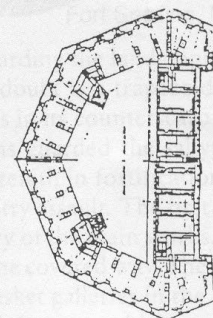
Fort Wintrop, MA



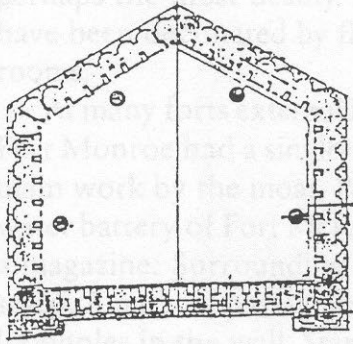
Fort Independence, MA



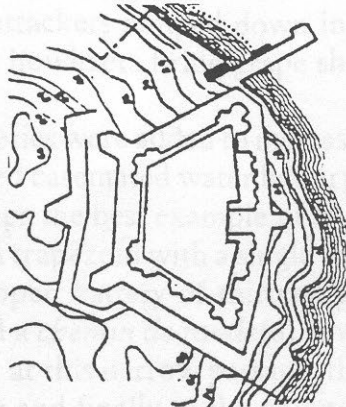
Fort Warren, MA



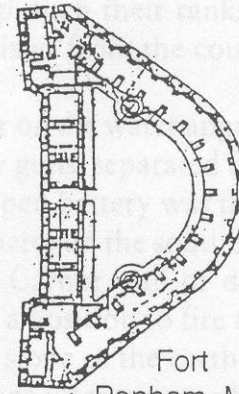
Fort at Clark's Point, MA



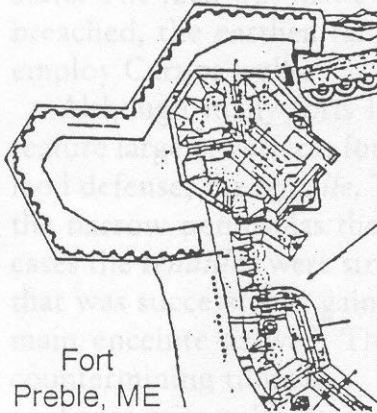
Fort Constitution, NH



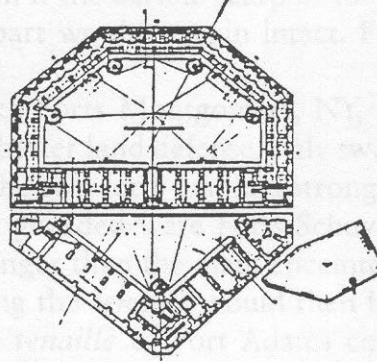
Fort McClary, ME



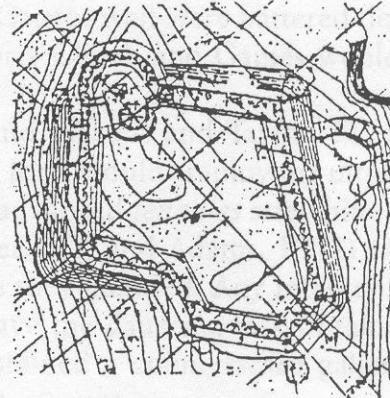
Fort Popham, ME



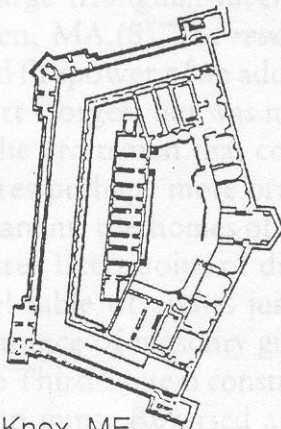
Fort Preble, ME



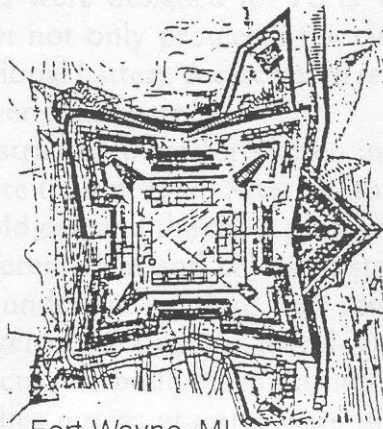
Fort Gorges, ME



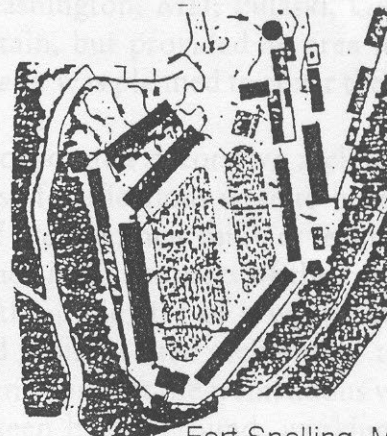
Fort Scammel, ME



Fort Knox, ME

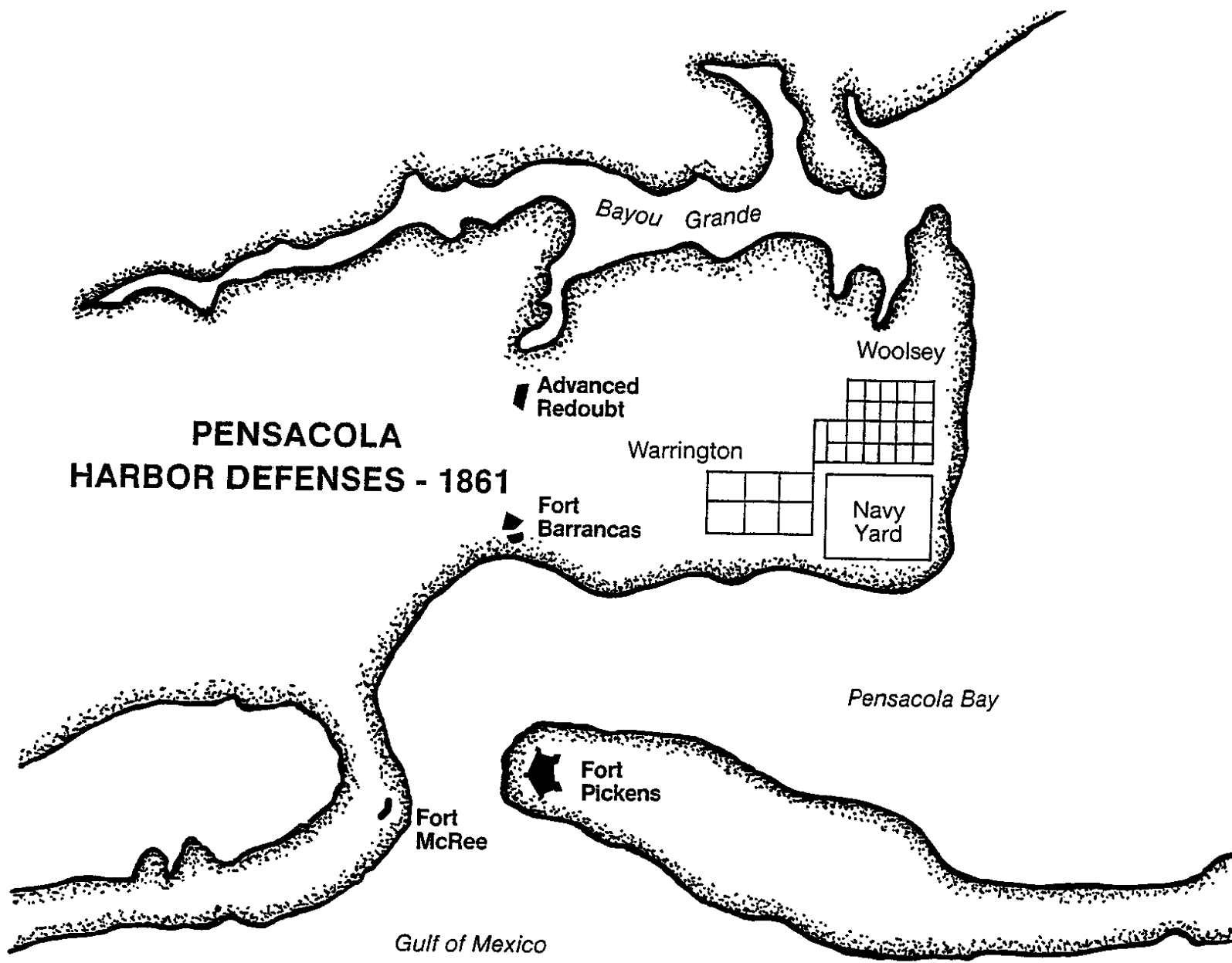


Fort Wayne, MI
DETROIT

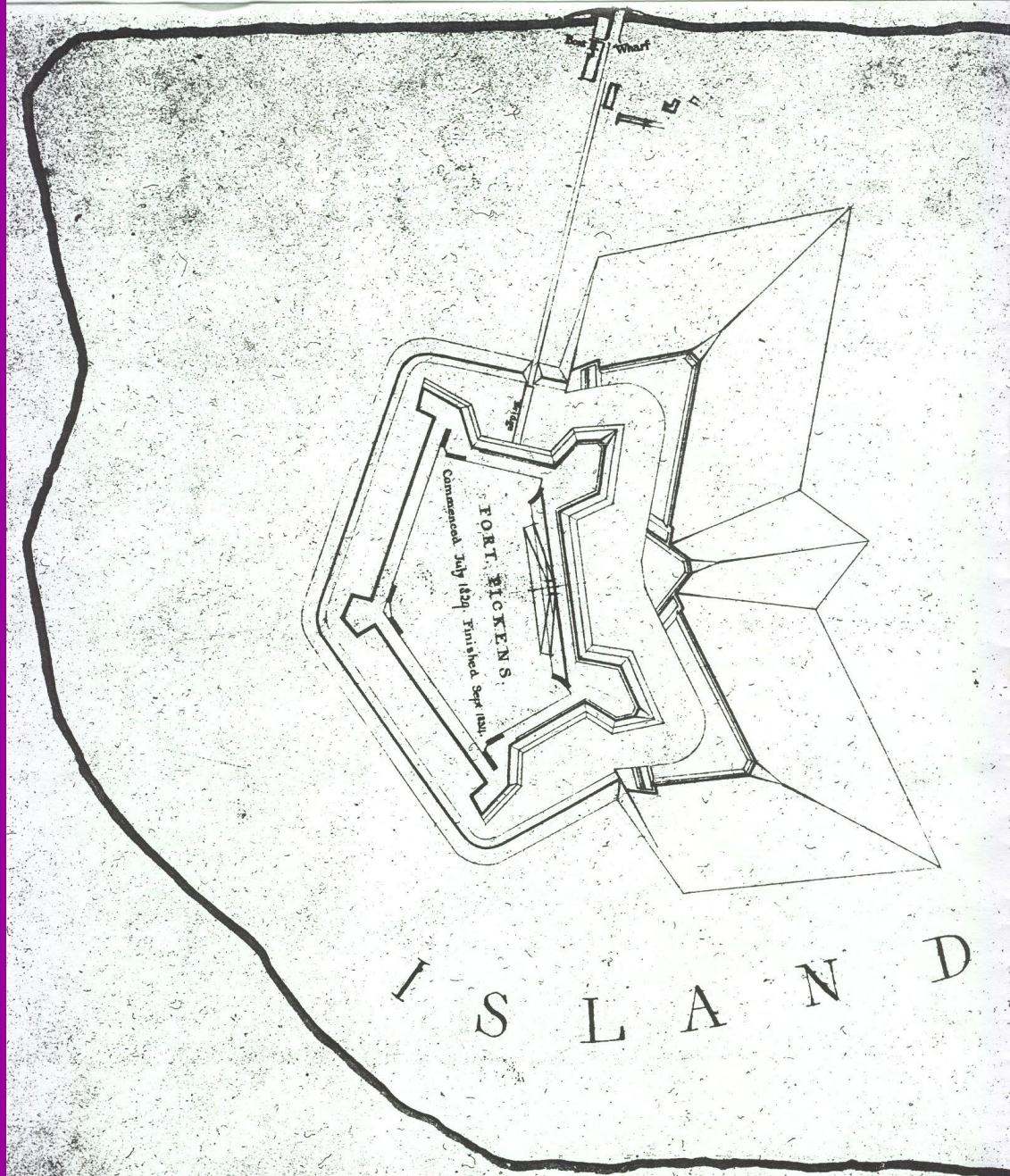


Fort Snelling, MN

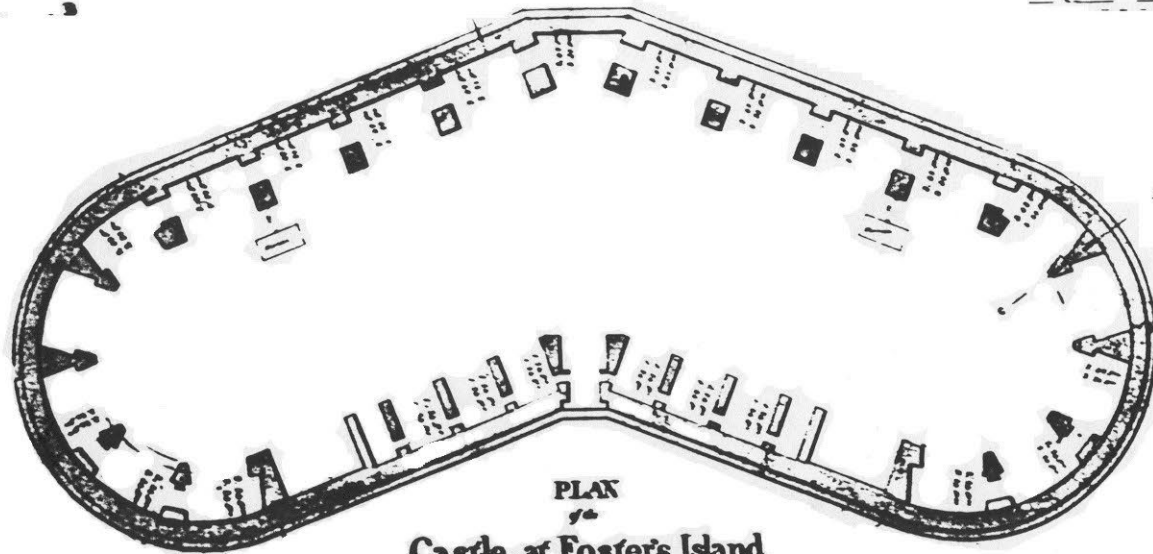
PENSACOLA HARBOR DEFENSES - 1861



Fort Pickens, 1829-
1834



PENSACOLA.

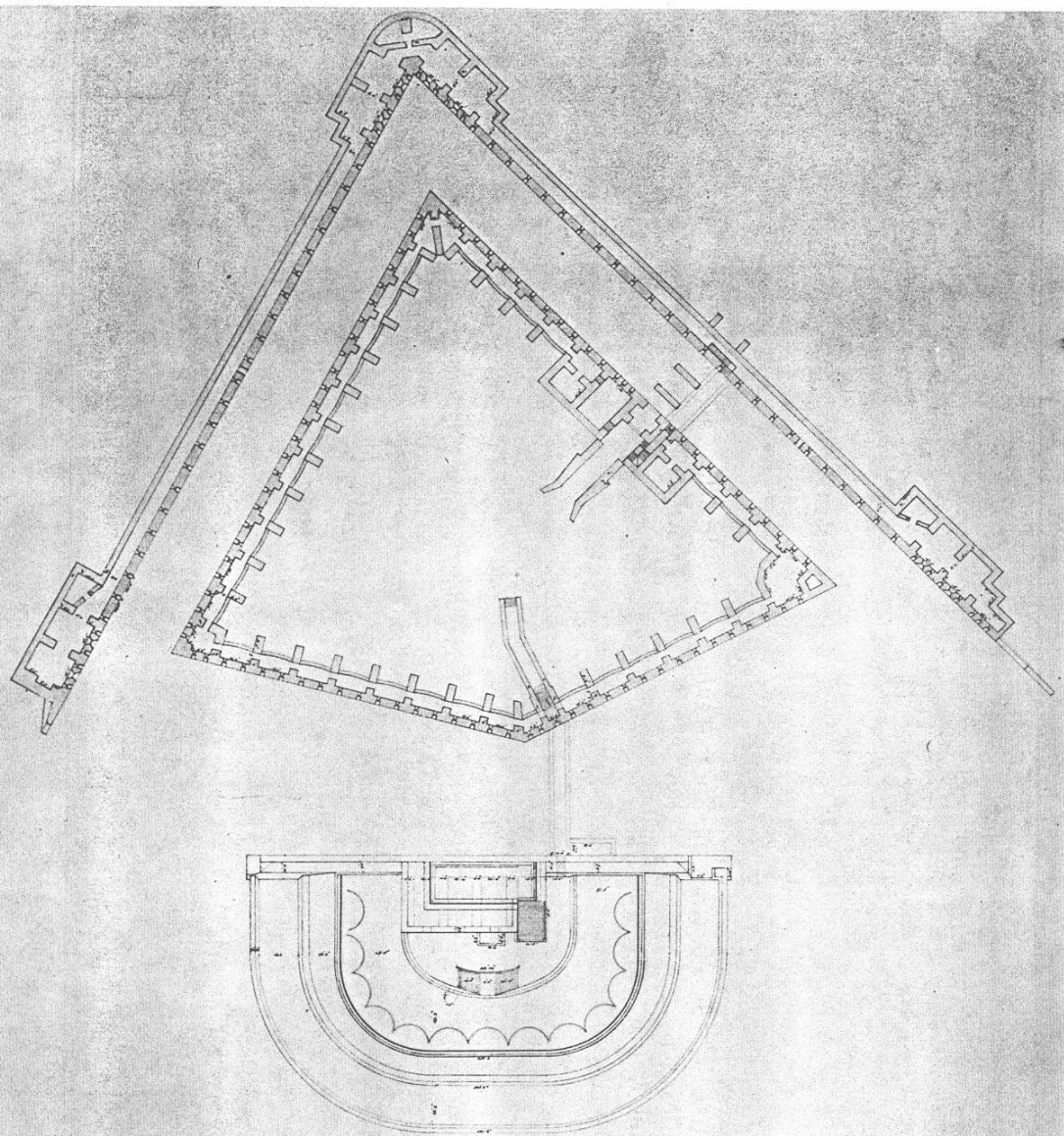


PLAN
of
Castle at Foster's Island.
Exhibiting the progress of the work
up to the 30th September



Fort McRee, 1833-1838

Fort Barrancas,
1839-1844



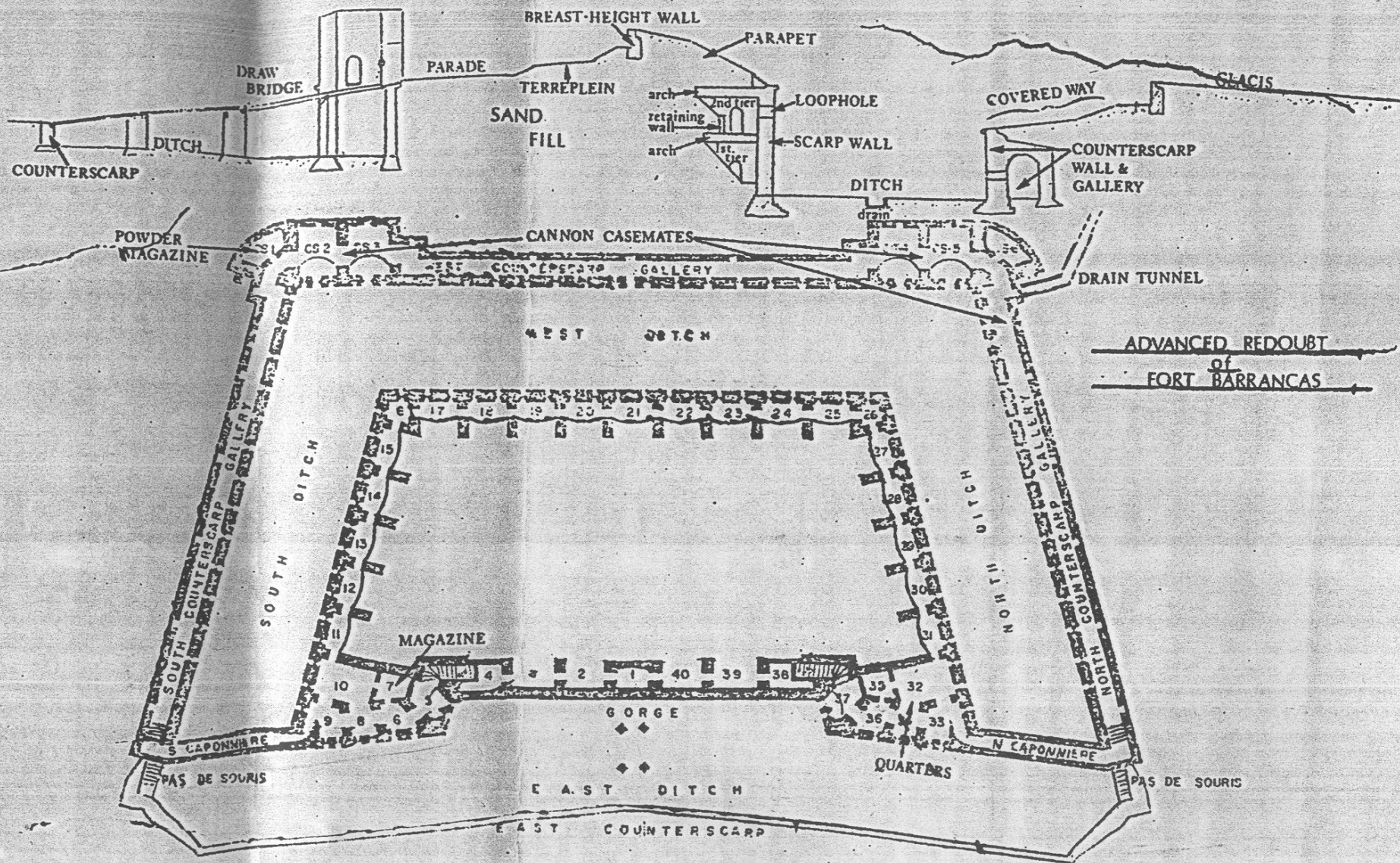
**FORT SAN CARLOS DE BARRANCAS,
FLORIDA.**

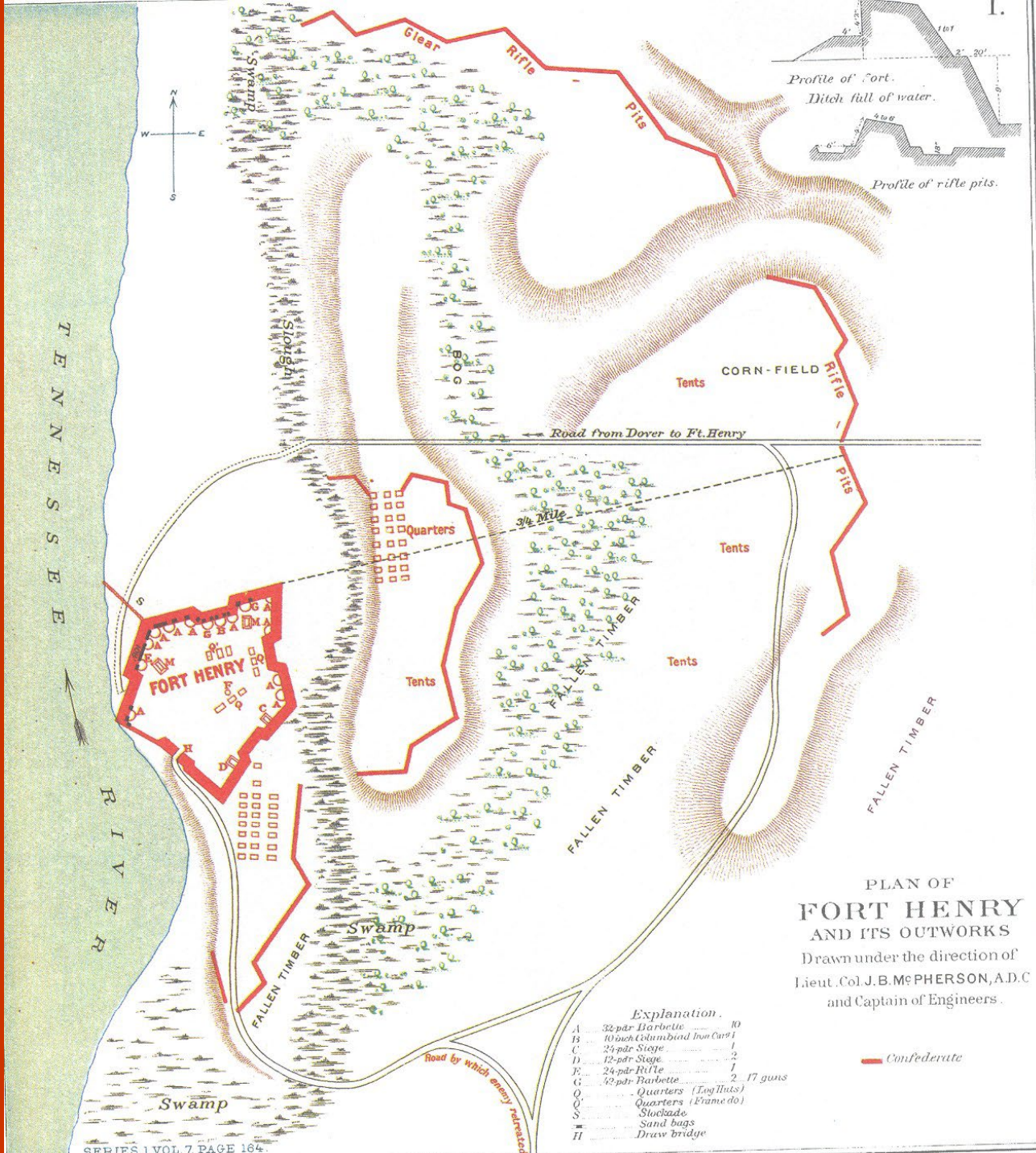
HORIZONTAL SECTION THROUGH LOOP HOLES.

Designed under direction of Brig. Gen. S. T. Prime U.S. Art. Major Corps of Engineers.

Scale 1/4" = 10'

The Advanced Redoubt of Fort Barrancas, 1845-1870





PLAN OF
FORT HENRY
 AND ITS OUTWORKS
 Drawn under the direction of
 Lieut. Col. J. B. McPHERSON, A.D.C.
 and Captain of Engineers.

Explanation.

A	32-pdr Barbette	10
B	10 inch Columbiad Iron Cannon	1
C	24-pdr Siege	1
D	12-pdr Siege	2
E	24-pdr Rifle	1
G	32-pdr Barbette	2, 17 guns
Q	Quarters (Log Huts)	
Q	Quarters (Frame do)	
S	Stockade	
—	Sand bags	
H	Draw bridge	

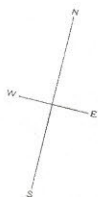
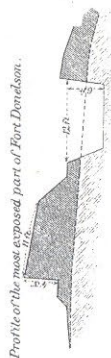
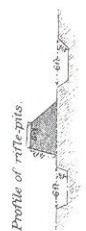
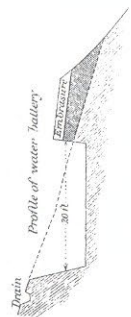
— Confederate

PLAN OF FORT DONELSON

AND ITS OUTWORKS
 Surveyed under the direction of
 Lieut. Col. J. B. McPHERSON, A.D.C.
 and Captain of Engineers
 BY
 Lieuts. JENNEY and KOSSAK.

Scale of Yards
 0 100 200 300 400 500 yds.

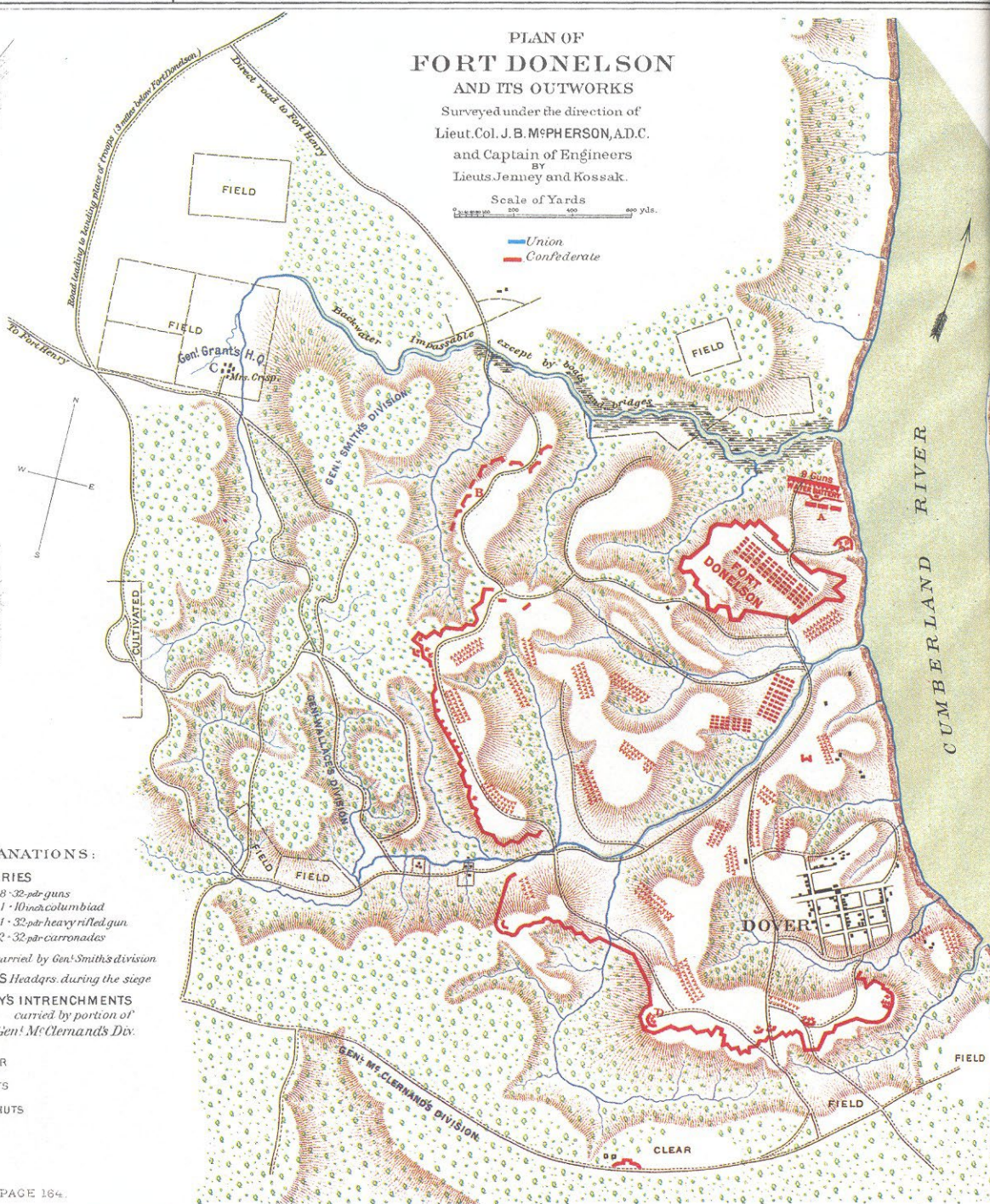
— Union
 — Confederate



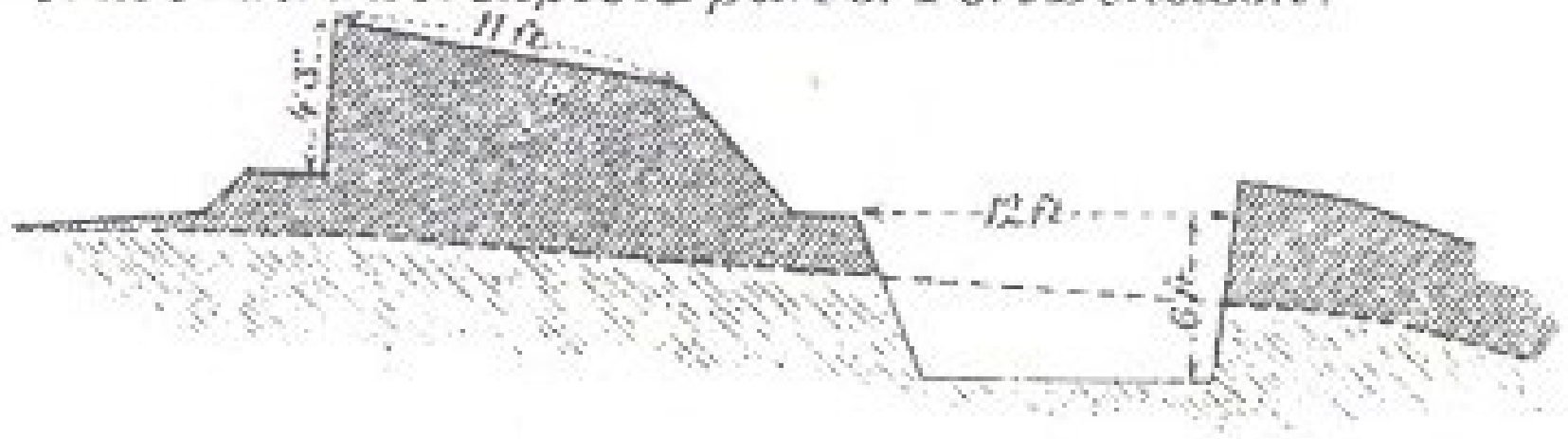
EXPLANATIONS:

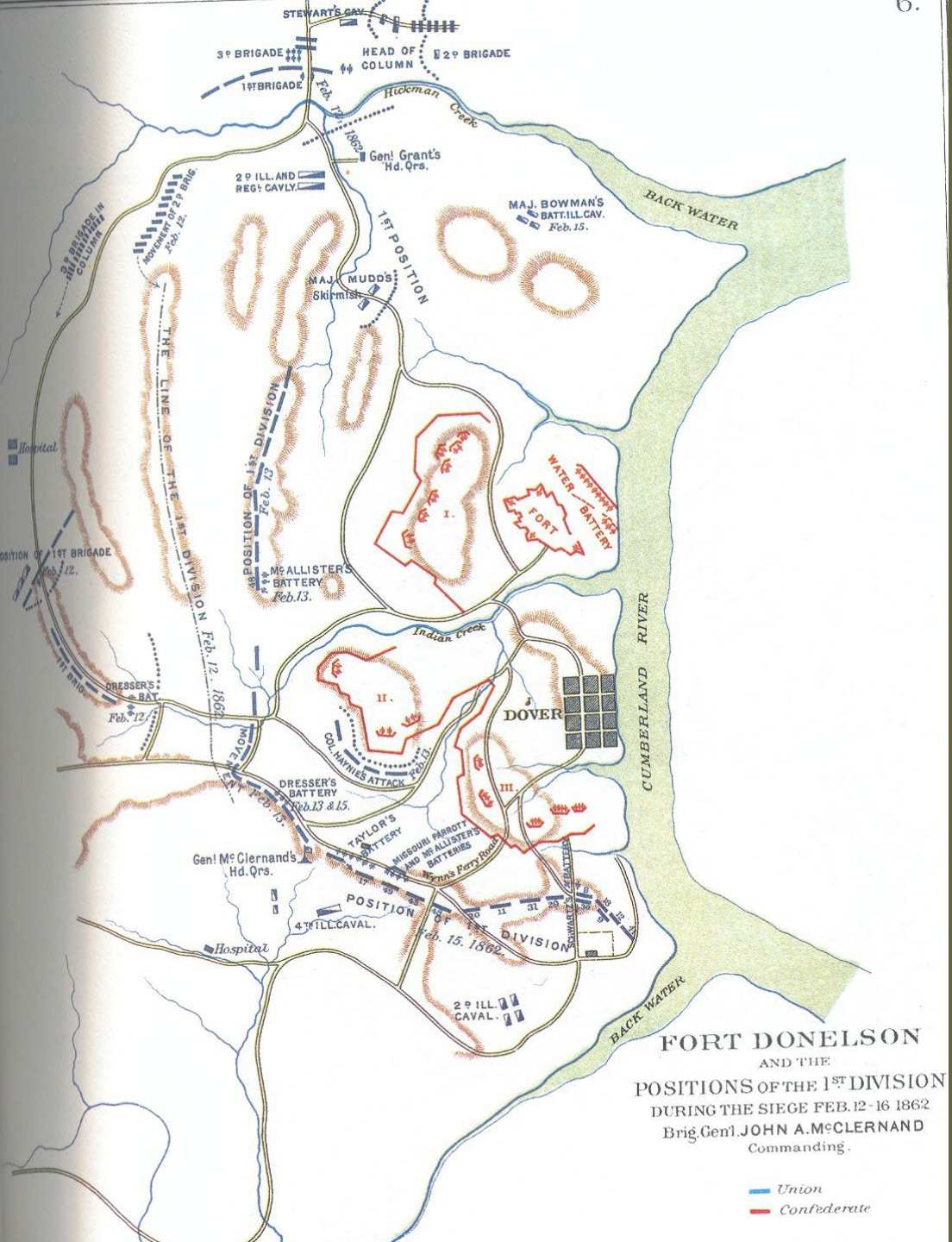
- A WATER BATTERIES
 LOWER BATTERY 8 - 32 pdr guns
 1 - 10 inch columbiad
 UPPER BATTERY 1 - 32 pdr heavy rifled gun,
 2 - 32 pdr carronades
- B RIFLE-PITS carried by Genl Smith's division
- C GENL GRANT'S Hdqrs. during the siege
- D PART OF ENEMY'S INTRENCHMENTS
 carried by portion of
 Genl McClelland's Div.

- ✕ ✕ ✕ FALLEN TIMBER
- ▲ ▲ ▲ ENEMY'S TENTS
- ■ ■ ENEMY'S LOG HUTS
- ☼ ☼ ☼ WOODS



Profile of the most exposed part of Fort Donelson.



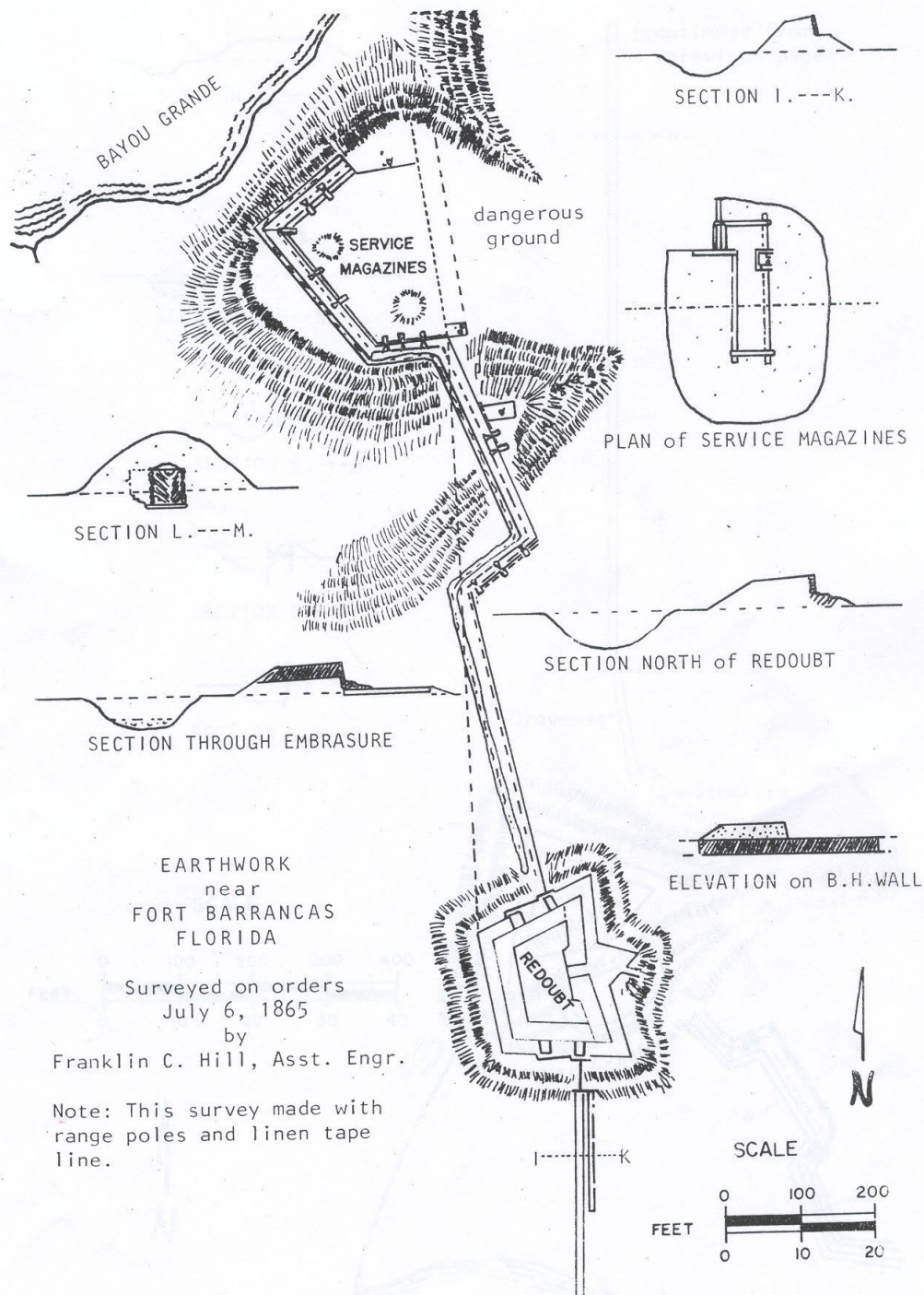


The Siege of Fort Donelson, Feb. 12-16, 1862

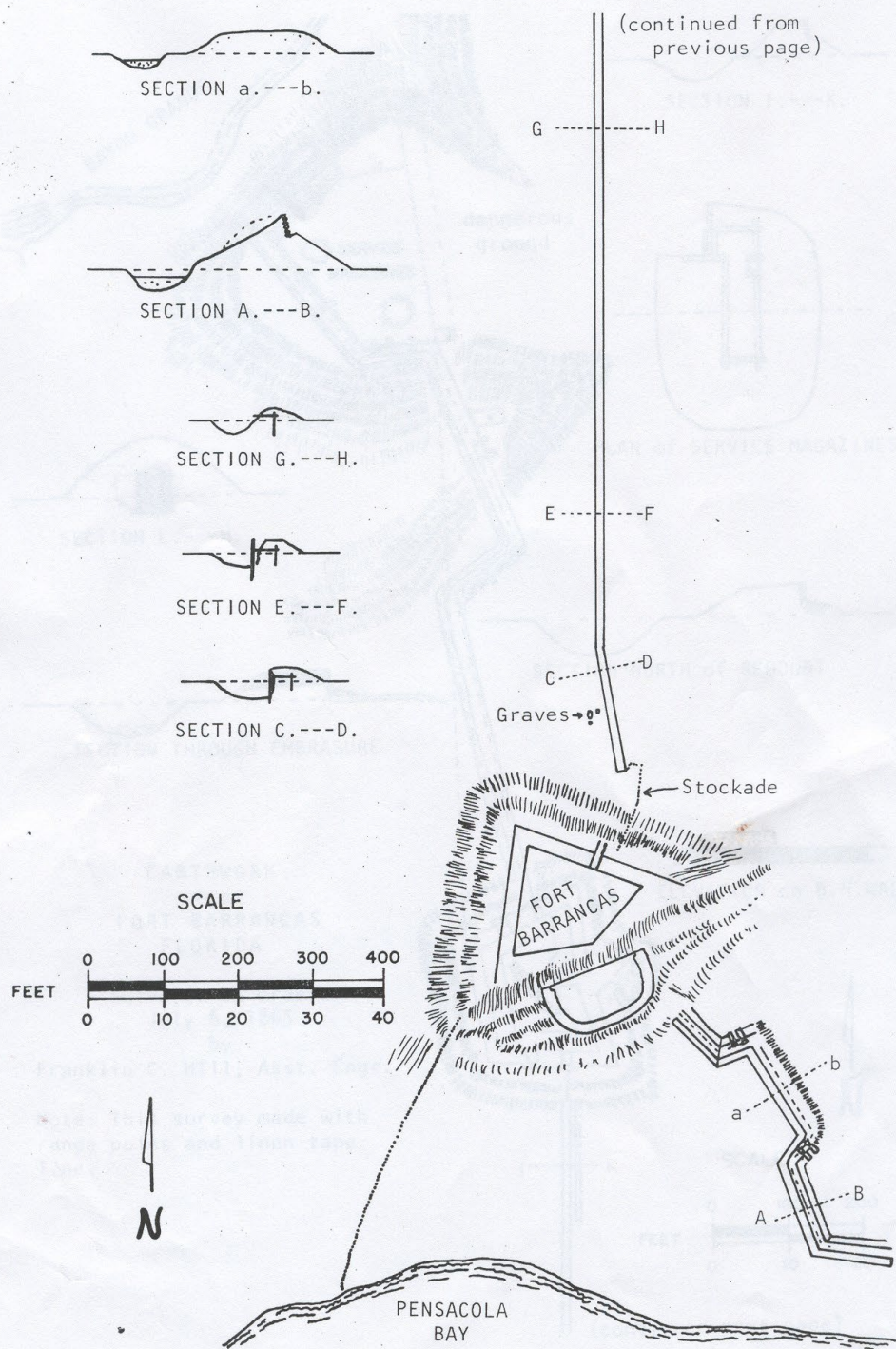
FORT DONELSON
 AND THE
 POSITIONS OF THE 1ST DIVISION
 DURING THE SIEGE FEB. 12-16 1862
 Brig. Genl. JOHN A. McCLEARNAND
 Commanding.

— Union
 — Confederate

Field works for the Barrancas Enclave, 1863- 1865



Field Works, South End



The End of an Era: Farragut Forces the Entrance to Mobile Bay with Steamships and Ironclads, 1864

