Works

1 Keller's Battery

2. Lines Queen's, Prince, King's

3. Grand Battery – north Bastion

4. Old Mole Gun and Mortar Batt.

5. Saluting Batt. &c –

6. King's Bast. – Monck's Regt.

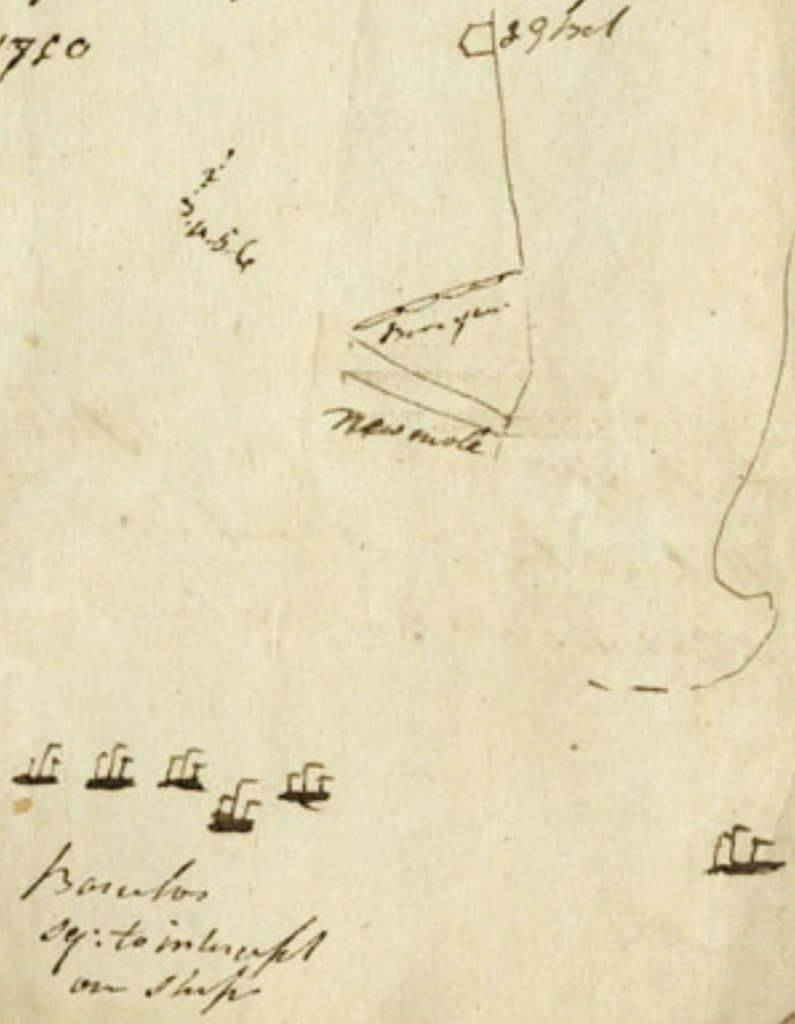
7. South Bastion –

8. Flat Bastion –

9. Eight gun Batt. – Felanbrier

10 Lines – New Mole Batt.

Anecdote
— Officer and Monkey
6 fire ships on the 6 June
1780



[illegible] to be [illegible] on any [illegible] 3 years after [illegible] stay upon [illegible] Mortar 13 [illegible] 13 [illegible]

In the Spanish time [illegible] N.R. [illegible] Prob. about 60 pieces of Cannon & 30 Mortars —

Mortar Battries

Picket — Beds 6 by 8

Bombardeirs do not ob[serve] the

Land Bed &c

Exposed to three fires —

Front — flank — rear

Last most dangerous

flank next — front batteries not enfiladed

— Naked

Gaulment begun in

the trench —

In Square redoubts half

the side in yards square

gives the number of troops

ob[serve] Spear 10[th] = 100 men —

In equal redoubts the angles are the weakest —

Different methods of strengthening straight work —

An Enrasellée —

To defend a flank — Bastions — reentering angles

To defend two flanks — Throw — Salient angles — Equal redoubt —

Abbatis — Non flank Defence

Fort — Different figures

2 Object in view —

Regular figure —

Rampart 10 or 10 yards

Parapet — Footing — Lined with

Slope — Bastion — face flank —

Gorge — Angles —

× Dimension —

face 100 flank 60

Curtain 150 yards —

Cannon mounted all round

— Use of Bastions —

+ Reason of the different

angles —

Town — Barracks, Mag.

Gates always in the ensiln
Sally ports —
Ditch 30 yards — 15 o 20
feet deep
Berm — Fraises —
Scarp — Counterscarp —
Defence of the Ditch
Tenaille — Ram horn —
Caponier —
Out works —
Ravelin — Contiguard —
Tenaillon — Lunettes —
All placed to defend each
other —
Redoubt in the Ravelin
Crown work — Corne

— Covered way 20 or 25 yards
broad — parapet — Glacis
— Place of Arms — Sally ports
— Pallisades — Roads —
+ Communication —
Bridges — floats — boats
— Harbour in the Ravelin —
+ Draw bridge — portcullis

Rampart —

Breadth - — 24 yards

Height mountain —

Parapet — 6 yards

Ditch . . 30 yards

Covered way . . 25 —

Angles —

Salient angle	74 1/2
— Shoulder. —	115
— Curtin — —	95 1/3 —

Lines —

Face — —	100
Flank —	49
Curtin — —	154.
Gorge —	92
Capital —	95
Normal — —	54
Line of defence.	265 —

Fortification

— Single stone walls insuf
— Attack superior to Defence
— Obstacles in his way —
— Below fort above bank
Ditch — simple work
— Dimensions — 20 feet
Room 100 — Precipice —
— Wet Ditch but — also
built near navigable river
Ancient Persic Modes
Walls built of bricks
— and stone —
— Bricks burnt & Dried —
Latter with Straw 5 year
— Towers 30, 15 . . 10
Temples . . Greater and
of Marble —

Form - Vitruvius
Vegetius - Rentring -
- manner of building
20 feet thick - 40
- earth beat - no
rampart - reason -
- Battlements -
- Gates - folding Doors
Pengos - Petrellis
Cataracta -
- road to the Gates to
the left -
Jerusalem - Carthage
Pekin -

Armour -
- Shins -
- Helmet - Coat of mail
Gauntlets - Greaves -

Helmet - Galea Gian
Jones -
- Leather - wood - brass
Iron -
- Shape - Close - open
Close in Eastern C.
- Gullah - Dawd -
- Pharsalia Flows
- Common - plain
officers - Crest - front
to rear - Cross - Double
Jumpose - blows - Bina
Feathers - Tygers
women - Enemies

Coat of Mail

Lorica — Lorum —
Dart — whole body
Thorax — Pectoral —
— Tied on the side —
— Thick
Metal — Lor.a Squa:
Lor.a Hamata — Net w
Lobster tail — State
— Folds of linen —
Spanish hoops Cannae
Polytus —
— W.t Coto 70 pounds

Boots
Knemides — Ocrea
used by the Greeks —
Homer —

Gloves — Gauntlets —

Shield —
Clypeus — Ramna — Scutum
round — oval — oblong —
3 feet — 4 by 2 1/2
Umbo point — Umbo —
— made of wood covered
with hides and Metal —
— Tyrian Shields all metal
Ramna or Clypeus. by the
Velites — Scutum by
the Legionary troops —
— Great Shields — Ar-
mour bearer —
— Achilles Shield —
Left arm — covered
attack of the Belgae —
— venerable for Shield
— Epam — Naraci —
— Spartan mothers —
— ἢ ταν ἢ επι ταν —

Offensive Weapons
— Flint — Stones and Bill
Challenges —

Sling
Arm length —
— Leather wholly or part
Balearian Sling — Bread-
Length — arm — 3 Slings
Throw Stones — Leaden bullets
darts —
— Shield three round
One Rev^d bat — Dagger
Stones in bullets carried
in a pouch before —
700 men in Rev^d all
left handed &c —
— David killed Goliath —
— Most portable W^n —
— Ammunition very When

Bow —
— Elast^y — Branch of a tree
Ash — yew — horn — steel —
— various shapes —
— Sizes various
— Rest not ascertained —
+ Persia — Corone — Argum
— Bow strings — Hemp
Silk — hair — Sinews —
+ Capitol — Carthage
× Vepri Calve
— Arrows — first of reeds
Hardened in the fire —
Flints — Fish bones
Metals — Barbed —
— ash 27 inches —
Feathers — Absurdity —
— use of feathers —
— Quiver = 24 Arrows
— Ranges 200 yards —
5 Arrows for 1 Mark

Ovid — Bulwer — Pling
— Volat & incandescit ce
— Lucretius
" Plumbea vero glans
" etiam longo cursu
" volvunda liquescit

Seneca —
" aera motus extremus
" et externatus accendit
" sic liquescit excussa
" glans funda, et attri
" tu aeris, velut igni
— distillat —

— Ammianus — "et interdum
nimio ardore scintillan

— Aristotle — respectable
authorities — & modern
writers on Alignities —

— Chemistry — unspecified —
— Solution — form al
tered — blow — resistance
— Sines Condage — after

+ Fistibulum —
4 feet long — Pling
to 10 cwt —

Cinderwell — Long
Tow in Jesus

Sword — Pike

— pointed Stake — pike

— Club —

— Sword — Spear —

— Roman Sword — 18 pr.

— Straight — Tartar bind

Grand simple —

— Brass — iron —

— Romans stabbed —

— On the right side —

— Chinese Swords point

to point — Draw them —

+ Fire in faces —

Spear — Pike

Sarissa — Anchor — Down

Pasta — Pilum — Javelin

21 to 12 feet . 17 . 3

No. 1 : 2 . 7 —

Form of the heads —

— Diamond — barbed —

— Long —

— Sarissa charge only

— Pilum — both Off. & Def.

— Pasta Min.r always

missile. — Carried in

the Bucklr. —

— Marius' wooden Peg —

Plutarch's account absurd —

Great Engines —

1 Rome Stones — Darts
5, 6 lb. 65 lb

2. Same both — but often
Different —

3. Balista — Catapulta

4. Names reversed —
confounded —

5. — Power the same in
all — Twisted Cordage
— Power very great —

6. One — Two Systems
Styles — 2 Brachia

7. One System Stones
Two — Darts —

8. Double — Balista
Single Catapulta —
9. Polybius, Caesar and
Vegetius agree —
10. Vitruvius reverses —
— Am: Onager —
— Scorpio — —

— Tones —
— musical note —
— brought to unison
— capitals axis — Rabbet
Chest pins —
arm — wood — steel —
— Cord or Cable —
apparatus for bending
it — Diotrion
— Axis in Peritrohio —

Sinew bondage —
— Animal substances
— Vegetius — Sinews —
— Hind legs of a deer best
Twine useless — proved
— Nervi ergazomenai —
— Nearchus to Cassiu —
— Rows through relaxed
— Manufactured — fibres
spun — kept in oil —
+ Rules of Calculation
— Two means proposal:
+ Duplication of the Cube
— 3 famous problems
— Rule not applicable —

Ram —

— Most powerful — ancient

— Ram suspended in Eg.
by cables & chains —

— head — counterweight

Josephus's Account.

Length — — 75 feet

Thickness — — $2\frac{1}{2}$

Head — — 10 men

Horns, each = 1 man 25

Dist. — — $1\frac{1}{2}$ foot

weight — — 250 Tons

To draw it . . 60 waggons

— Josephus's Account incons.

— Siege of Jotaphat — man
jumped from the wall &c —

— Greater Ram in Rollers
velocity increased —

Manner of applying the power – Silent – Drawn pierced – Two parties – Velocity not too great – Ram sometimes of great price
– Length adds much to the power –
+ Momentum – wrong conclusion – How w. of service – Vibration –
– St Pauls –
+ Making of the Ram Greeks say by the Phoe
– Vitr. first used at the siege of the Cadiz by the Carthaginians – Pliny at the siege of Tyre –

Old Test:
Ezekiel – Uzziah
– Joab – Beth maacha
– Jericho – Rams horn

— round shield made of osier,
light wood, rope, sinews
covered with leather plates of
metal, or sheet skin of metal
in concentric circles — some
were concave —
— Great shields covered the
whole body carried by servants
before their masters in order
the masters discharge their
missive weapons — Retainers
in angles below wounded off
— Man of a shield been honorable
became dangerous —

Offensive weapons

Swords first of wood hardened in the fire — afterwards of brass; some of these found in Ireland — Swords of great value in early age —

— Roman Legionary horse short and strong blade, about 18 inches, two edged, cut and thrust

— Pugio or dagger or lesser sword

+ Bow of great antiquity. The Romans few archers among their own horse — accelerant particularly Asiatics, where it still continues an instrument of war — Bow sometimes of two curves joined by a strong fine in the middle, sometimes one like the English bow — made of yew, ash, elm, or wild hazel — Aelian says the Britons were of archery in Britain

— Arrows anciently made of reeds, cornel wood, &c — Ash is said to be the best — Bow strings of hemp, flax and silk

Arrows were armed anciently with flint or metal heads of different forms — carried in a quiver or arrow case — The bow also in a case to keep it dry

— Range from six to 18 and 20 score yards — many deaths by arrows fired on marshes

— Arrows pierced quite through an oak board King Edward the 6th Journal

— In ancient times strings of combustible matter fixed to the arrow on account of fire work 12 score yards — archers gloves

24 arrows make a —

Sling

Flax hair or leather cut or
weaven into strings — would
carry a stone six hundred
yards — Pentabulum —
— three stones head stay bath
hardened
+ Spear Pike lance — of
ash — Fraxinus —
— head flint, metal — either charging
or throwing — length of the
pike about 15 feet sometimes
18. Head four inches long
and 2½ at the largest stem
— Javeline 3 feet long 1 inch
thick spike four inches
long very slender —

Gabion Battery

Barbet Battery

Cannon play over the
fort — fired in the Redoubt
of the place — they call
Magazine — balls — nothing
red hot bullets — wad with
a piece of wood two or three
inches thick —

+ 32 pr. remained red hot
for 20 minutes and fired
from 40 minutes

18 pr. fired at 30 minutes

Mortar Batteries

Arrows

— Accustomed to gave —
— two faces — open in the
rear — situation — two objects
— Arrows have seldom a
foot bank —
— two ways of parapet from
3 rank — front can fire
6 or 7 times in a minute
— Cannon placed near the
salient angle

— Redoubts —

— square redoubt four bastions
— Rampart —
— $\frac{1}{2}$ side in yards squared
gives the number of men to
defend — and twice as many
will make it in 12 hours
— Entrance in the rear —
— traverse — Chevaux de frise
— Defect of square redoubts —
— angles without defence —
— remedies — rounded — flatted
+ Cremaillere
— Circular redoubt —
— advantages —
— Disadvantages —

Forts

quent object a cross fire
forming angle not less
than 90°. —

+ Square fort —
— Bastions — face — flanks
Saliant angle — Shoulder
angle of the curtin —
— Curtain —
— use of the different parts
1 faces 2 flanks curtin —
+ Certain lines and angles
preferable to others —
— Regular fortification

Macedonian Phalanx

500 in front
16 in flank

Pikes of the fifth row 3
feet before the front —

11 ranks supported their
pikes on the shoulder
of those before them —

Apollo inventor of the bow
— taught the Cretans —
— Scythian bow a semicircle
when unbent —
All nations use the bow
Indians —
— Bows of steel or wood —
and for the
— Persian — Corona — Soldier's bow
— Bow strings — Thongs — ~~tea~~
Horse hair — Siege of
Carthage —
— Arrows of reed tree —
— Iron head hooked or barbed
two three or more —
— ~~Quiver~~ Feathers — oblique
— Method of drawing the bow
— Quiver to the breast
— Persian and Modern bow
the right ear — amazon
Cross Bow —
— Invented in the middle
ages — Arrows or bullets
— for shooting deer or fowls —