

**0abc** (a 0 A.D. modification)  
<https://github.com/0abc/0abc-unified.git>  
*version 0.0.22* (Alpha XXII: Venustas)

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# 1 Introduction

**0abc** is an acronym for “0 A.D. is Actually Before Christ”. Of the twelve civilizations and factions included in the default distribution, three (Britons, Gauls, Iberians) cover the whole period (c. 500–1 B.C.), three (Athenians, Persians, Spartans) the Classical period (c. 500–300 B.C.), and six (Carthaginians, Macedonians, Mauryans, Ptolemies, Romans, Seleucids) the Hellenistic period (c. 350–150 B.C.); civilizations (Armenia, Numidia, Parthia, Pontus) peaking in the last two centuries (c. 200–1 B.C.) are noticeably lacking.

This mod, however, does not include any new factions, nor icons, sounds, visual actors, etc. It merely tweaks, rebalances, and improves upon what already exists in the game. Amongst other things, it contains a moderate bonus attack counter and penalty system.

All the content is completely open for any use: feel free to download, change, redistribute, or (re)use anything in any way you like; no asking for permission or granting credits is required for incorporating parts or all of it in your own mods (or main distribution). Have fun with it!

## 1.1 Instructions

- Use `git clone https://github.com/0abc/0abc-unified.git` to get the repository directly or download it as a zip via `https://github.com/0abc/0abc-unified/archive/master.zip`
- Place it in your `/Oad/mods/` folder:
  - GNU/Linux (e.g. Fedora) typically: `~/.local/share/Oad/mods/`
  - Macintosh/Apples OS X typically: `~/Library/Application\Support/Oad/mods/`
  - Microsoft Windows typically: `~\Documents\My Games\Oad\mods\`
- Launch 0 A.D., click “Tools & Options” and “Mod Selection”
- Select **0abc**, click “Enable” and “Save Configuration”
- Add, remove, or move up or down any other mods, click “Save Configuration” and “Start Mods”
- Click “Learn To Play” and “Structure Tree” to see the mod(s) implemented.

## 1.2 More factions (not implemented)

Add more factions to cover the 8th, 7th, 6th and the 2nd and 1st centuries B.C. (existing factions are indicated with an asterisk (\*)):

Armenians (Greater Armenia, 331 BC–428 AD, peaked first half 1st C. BC) Assyrians (Neo-Assyrian Empire, 911–612), Attalids (Pergamon, 282–133), Britons\*, Carthaginians\* (814–146), Chaldeans (Neo-Babylonian Empire, 626–539), Epirus (330–167), Etruscans (768–264), Gauls\*, Greeks (c.800–146; subdivided into four factions: Athenians/Athens\*, Boeotians/Thebes, Lacedaemonians/Sparta\*, and Syracuseae)<sup>1</sup>, Iberians\*, Illyrians, Lydians (unclear–546), Macedonians\* (Macedon, 808–168, peaked 323), Mauryans\* (India, 326–180), Nubians (Kush (Napata, Meroe), 1070 BC–350 AD, peaked c.700 BC), Numidia (202–40), Parthians (Arsacid Empire, 247 BC–224 AD, peaked middle 2nd C. BC), Persians\* (Achaemenid Empire, c.550–330), Phrygians (c.800–c.600), Pontus (281 BC–66 BC/62 AD, peaked first half 1st C. BC), Ptolemies\* (Egypt, 305–30), Romans\* (Roman Republic, 509–27), Scythians, Seleucids\* (Syria, 312–63), Thracians, Urartu (Armenia, 860–590).

## 1.3 Further information

People interested in Antiquity are lucky to live nowadays. Thanks to widespread digitization, availability of sources is no longer a problem; the choice of sources is. Wikipedia is a mixed blessing which has to be used with care: some articles are much better than corresponding lemmas of paper encyclopaedias, others contain outright rubbish and dangerous nonsense. *The Cambridge History of Greek and Roman Warfare* (2007) is a decent starting point. Those without access to a university library and looking for something specific can contact me.<sup>2</sup>

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<sup>1</sup>Other important local powers included Milet and Samos peaking in the Archaic period, the Acarnanians and Aetolians, Achaeans, and Rhodians peaking in the Hellenistic period, and Argos, Corinth, and Tarentum covering all periods.

<sup>2</sup><https://wildfiregames.com/forum/index.php?/profile/21417-nescio/>

## 2 Units

### 2.1 General overview

- All soldiers (except for war dogs) require at least some metal, to encourage feminization.
- All soldiers (citizen, mercenary, and champion) can promote up to twelve times; each rank grants +5% health, attack damage, and capture attack, melee units also receive +1% movement speed and ranged units −1% spread.  
Healers receive +5% health, −5% healing time, and +1 m healing range every promotion.
- Loot is standardized to 10% of costs, experience is equal to the sum of the total costs.

#### 2.1.1 Soldier types

|                            | infantry | camel  | cavalry | biga   | quadriga | war elephant |
|----------------------------|----------|--------|---------|--------|----------|--------------|
| mercenary metal cost       | +20.0    | +25.0  | +30.0   | +50.0  | +60.0    | +75.0        |
| champion metal cost        | +100.0   | +100.0 | +100.0  | +100.0 | +100.0   | +100.0       |
| hero metal cost            | +400%    | +400%  | +400%   | +400%  | +400%    | +400%        |
| mercenary wood cost        | +0.0     | +0.0   | +0.0    | +0.0   | +0.0     | +0.0         |
| champion wood cost         | +50.0    | +50.0  | +50.0   | +50.0  | +50.0    | +50.0        |
| hero wood cost             | +400%    | +400%  | +400%   | +400%  | +400%    | +400%        |
| mercenary training time    | −20%     | −20%   | −20%    | −20%   | −20%     | −20%         |
| champion training time     | +150%    | +150%  | +150%   | +150%  | +150%    | +150%        |
| hero resource cost         | +400%    | +400%  | +400%   | +400%  | +400%    | +400%        |
| mercenary health           | +0%      | +0%    | +0%     | +0%    | +0%      | +0%          |
| champion health            | +50%     | +50%   | +50%    | +50%   | +50%     | +50%         |
| hero health                | +900%    | +900%  | +900%   | +900%  | +900%    | +900%        |
| mercenary armour (h, c, p) | +1.0     | +1.0   | +1.0    | +1.0   | +1.0     | +1.0         |
| champion armour (h, c, p)  | +3.0     | +3.0   | +3.0    | +3.0   | +3.0     | +3.0         |
| hero armour (h, c, p)      | +5.0     | +5.0   | +5.0    | +5.0   | +5.0     | +5.0         |
| mercenary attack damage    | +15%     | +15%   | +15%    | +15%   | +15%     | +15%         |
| champion attack damage     | +100%    | +100%  | +100%   | +100%  | +100%    | +100%        |
| hero attack damage         | +400%    | +400%  | +400%   | +400%  | +400%    | +400%        |
| mercenary capture strength | +0%      | +0%    | +0%     | +0%    | +0%      | +0%          |
| champion capture strength  | +100%    | +100%  | +100%   | +100%  | +100%    | +100%        |
| hero capture strength      | +400%    | +400%  | +400%   | +400%  | +400%    | +400%        |

**NB:** Citizen soldiers are 100%. Champions also require twice as much experience to advance in rank. (Heroes can not promote.) Other unit statistic bonuses are removed.

#### 2.1.2 Worker rates

|                     | female | slave | citizen | mercenary | champion | hero      |
|---------------------|--------|-------|---------|-----------|----------|-----------|
| food.grain (farm)   | 0.50   | 0.35  | 0.25    | –         | –        | –         |
| metal.ore (mine)    | 0.35   | 1.00  | 0.50    | –         | –        | –         |
| stone.rock (quarry) | 0.35   | 1.00  | 0.50    | –         | –        | –         |
| wood.tree (lumber)  | 0.70   | 1.00  | 0.75    | 0.75      | –        | –         |
| food.fruit (forage) | 1.00   | 0.50  | 0.50    | 0.50      | –        | –         |
| food.meat (hunt)    | 1.00   | 1.00  | 1.00    | 1.00      | –        | –         |
| build (construct)   | 1.00   | 1.00  | 1.00    | 1.00      | –        | –         |
| promote             | no     | no    | yes     | yes       | yes      | no        |
| local aura          | yes    | no    | no      | no        | no       | yes       |
| global aura         | no     | no    | no      | no        | no       | sometimes |

#### 2.1.3 Unit categories

|                                 | population<br>slots<br>occupied | standard<br>food<br>cost | food<br>carry<br>capacity | food.meat<br>gather<br>rate | vision<br>range<br>(metres) | promotion<br>experience<br>requirement |
|---------------------------------|---------------------------------|--------------------------|---------------------------|-----------------------------|-----------------------------|--|
| War dogs                        | 0                               | 75                       | –                         | –                           | 60                          | 75                                     |
| Infantry                        | 1                               | 50                       | 10                        | 1.0                         | 75                          | 100                                    |
| Camels                          | 2                               | 90                       | 40                        | 1.8                         | 85                          | 125                                    |
| Cavalry                         | 2                               | 100                      | 30                        | 2.0                         | 80                          | 150                                    |
| Bigae (two-horse chariots)      | 4                               | 200                      | 60                        | 3.6                         | 80                          | 200                                    |
| Three-man bigae                 | 5                               | 250                      | 60                        | 3.6                         | 80                          | 220                                    |
| Quadrigae (four-horse chariots) | 6                               | 300                      | 60                        | 3.6                         | 80                          | 240                                    |
| War elephants                   | 6                               | 300                      | 75                        | 3.0                         | 90                          | 300                                    |

## 2.2 Unit statistics comparison tables

**NB:** The new values are displayed normally, the default “0 A.D. Alpha XXII: Venustas” values are displayed for comparison between brackets ().

### 2.2.1 Infantry units

| class   | pop.<br>size | training costs<br>(f, w, m, s; time)     | loot<br>(f, w, m, s; exp)            | vision<br>range | speed               | health       | armour<br>(h, p, c)     | damage<br>(h, p, c)    | range<br>(m) | rate<br>(ms)   | counters/<br>penalties   |
|---|--------------|--|--------------------------------------|-----------------|---------------------|--------------|-------------------------|------------------------|--------------|----------------|--|
| crossbow<br>archer infantry <sup>2</sup>      | 1<br>(1)     | 50, 25, 25, 0; 10<br>(50, 50, 0, 0; 10)  | 5, 2, 3, 0; 100<br>(5, 5, 0, 0; 100) | 75<br>(80)      | 8+8<br>(8+10)       | 50<br>(50)   | 1, 3, 5<br>(1, 1, 10)   | 0, 5, 1<br>(0, 6, 0)   | 48<br>(72)   | 1000<br>(1000) | 1.5× vs Archer Cavalry<br>0.5× vs Elephantry                                 |
| composite bow<br>archer infantry              | 1<br>(1)     | 50, 35, 15, 0; 10<br>(50, 50, 0, 0; 10)  | 5, 4, 1, 0; 100<br>(5, 5, 0, 0; 100) | 75<br>(80)      | 10+8<br>(8+10)      | 50<br>(50)   | 2, 2, 2<br>(1, 1, 10)   | 0, 6, 0<br>(0, 6, 0)   | 60<br>(72)   | 1000<br>(1000) | 1.5× vs Archer Cavalry<br>0.5× vs Elephantry                                 |
| longbow<br>archer infantry <sup>1</sup>       | 1<br>(1)     | 50, 40, 10, 0; 10<br>(50, 50, 0, 0; 10)  | 5, 4, 1, 0; 100<br>(5, 5, 0, 0; 100) | 75<br>(80)      | 10+8<br>(8+10)      | 50<br>(50)   | 2, 2, 2<br>(1, 1, 10)   | 0, 5, 0<br>(0, 6, 0)   | 60<br>(72)   | 1000<br>(1000) | 1.5× vs Archer Cavalry<br>0.5× vs Elephantry                                 |
| lead bullet<br>sling infantry                 | 1<br>(1)     | 50, 30, 20, 0; 10<br>(50, 20, 0, 30; 10) | 5, 3, 2, 0; 100<br>(5, 0, 0, 5; 100) | 75<br>(80)      | 12+8<br>(11+13)     | 55<br>(50)   | 1, 2, 3<br>(1, 1, 10)   | 0, 4, 1<br>(0, 9.5, 1) | 72<br>(48)   | 1000<br>(1000) | 1.5× vs Archer Infantry<br>0.125× vs Structures                              |
| sling stone<br>sling infantry <sup>1</sup>    | 1<br>(1)     | 50, 40, 10, 0; 10<br>(50, 20, 0, 30; 10) | 5, 4, 1, 0; 100<br>(5, 0, 0, 5; 100) | 75<br>(80)      | 12+8<br>(11+13)     | 55<br>(50)   | 1, 2, 3<br>(1, 1, 10)   | 0, 0, 6<br>(0, 9.5, 1) | 48<br>(48)   | 1000<br>(1000) | 1.5× vs Archer Infantry<br>0.125× vs Structures                              |
| javelin<br>infantry                           | 1<br>(1)     | 50, 45, 5, 0; 10<br>(50, 50, 0, 0; 10)   | 5, 5, 0, 0; 100<br>(5, 5, 0, 0; 100) | 75<br>(80)      | 14+8<br>(13.5+10.5) | 60<br>(50)   | 2, 3, 4<br>(1, 1, 10)   | 0, 10, 0<br>(0, 16, 0) | 24<br>(24)   | 1000<br>(1250) | 1.25× vs Archer units  |
| throwing axe<br>infantry <sup>2</sup>         | 1<br>(1)     | 50, 30, 20, 0; 10<br>(50, 50, 0, 0; 10)  | 5, 3, 2, 0; 100<br>(5, 5, 0, 0; 100) | 75<br>(80)      | 13+5<br>(13.5+10.5) | 65<br>(50)   | 3, 4, 5<br>(1, 1, 10)   | 9, 0, 0<br>(0, 16, 0)  | 18<br>(24)   | 1000<br>(1250) | 1.5× vs Spear Infantry   |
| pike<br>infantry                              | 1<br>(1)     | 50, 45, 5, 0; 10<br>(50, 50, 0, 0; 10)   | 5, 5, 0, 0; 100<br>(5, 5, 0, 0; 100) | 75<br>(80)      | 9+3<br>(7+2)        | 80<br>(100)  | 4, 5, 6<br>(10, 10, 15) | 0, 5, 0<br>(1, 3, 0)   | 8<br>(8)     | 1000<br>(2000) | 1.25× vs Chariotry, 1.5× vs Cavalry,<br>1.75× vs Camelry, 2.0× vs Elephantry |
| halberd<br>infantry <sup>2</sup>              | 1<br>(1)     | 50, 35, 15, 0; 10<br>(50, 50, 0, 0; 10)  | 5, 3, 2, 0; 100<br>(5, 5, 0, 0; 100) | 75<br>(80)      | 11+4<br>(7+2)       | 85<br>(100)  | 5, 5, 5<br>(10, 10, 15) | 3, 3, 0<br>(1, 3, 0)   | 4<br>(8)     | 1000<br>(2000) | 2.0× vs Cavalry  |
| spear<br>infantry                             | 1<br>(1)     | 50, 40, 10, 0; 10<br>(50, 50, 0, 0; 10)  | 5, 4, 1, 0; 100<br>(5, 5, 0, 0; 100) | 75<br>(80)      | 10+5<br>(8.5+6.5)   | 90<br>(100)  | 5, 6, 7<br>(5, 5, 15)   | 0, 6, 0<br>(3, 2.5, 0) | 4<br>(4)     | 1000<br>(1000) | 1.25× vs Javelin units   |
| axe<br>infantry <sup>1</sup>                  | 1<br>(1)     | 50, 35, 15, 0; 10<br>(50, 40, 10, 0; 10) | 5, 4, 1, 0; 100<br>(5, 5, 0, 0; 100) | 75<br>(80)      | 12+3<br>(9.5+6.5)   | 85<br>(100)  | 5, 5, 5<br>(5, 5, 15)   | 5, 0, 1<br>(5.5, 0, 0) | 2<br>(2)     | 1000<br>(750)  | 1.5× vs Siege weapons,<br>2.0× vs Elephantry                                 |
| mace<br>infantry <sup>1</sup>                 | 1<br>(1)     | 50, 30, 20, 0; 10<br>(50, 40, 10, 0; 10) | 5, 3, 2, 0; 100<br>(5, 0, 5, 0; 100) | 75<br>(80)      | 11+4<br>(9.5+6.5)   | 90<br>(100)  | 4, 6, 8<br>(5, 5, 15)   | 0, 0, 8<br>(0, 0, 5.5) | 2<br>(2)     | 1000<br>(750)  | 1.5× vs Cataphract Cavalry<br>0.125× vs Structures                           |
| curved (sabre)<br>sword infantry <sup>1</sup> | 1<br>(1)     | 50, 25, 25, 0; 10<br>(50, 40, 10, 0; 10) | 5, 2, 3, 0; 100<br>(5, 0, 5, 0; 100) | 75<br>(80)      | 10+5<br>(9.5+6.5)   | 95<br>(100)  | 5, 6, 7<br>(5, 5, 15)   | 7, 1, 0<br>(5.5, 0, 0) | 2<br>(2)     | 1000<br>(750)  | –  |
| two-handed<br>sword infantry <sup>1</sup>     | 1<br>(1)     | 50, 25, 25, 0; 10<br>(50, 40, 10, 0; 10) | 5, 2, 3, 0; 100<br>(5, 0, 5, 0; 100) | 75<br>(80)      | 10+5<br>(9.5+6.5)   | 95<br>(100)  | 6, 6, 6<br>(5, 5, 15)   | 6, 2, 0<br>(5.5, 0, 0) | 3<br>(2)     | 1000<br>(750)  | –  |
| short (broad)<br>sword infantry               | 1<br>(1)     | 50, 25, 25, 0; 10<br>(50, 40, 10, 0; 10) | 5, 2, 3, 0; 100<br>(5, 0, 5, 0; 100) | 75<br>(80)      | 10+5<br>(9.5+6.5)   | 95<br>(100)  | 6, 7, 8<br>(5, 5, 15)   | 4, 4, 0<br>(5.5, 0, 0) | 2<br>(2)     | 1000<br>(750)  | –  |
| hoplite<br>infantry <sup>1</sup>              | 1<br>(1)     | 50, 20, 30, 0; 10<br>(50, 50, 0, 0; 10)  | 5, 2, 3, 0; 100<br>(5, 5, 0, 0; 100) | 75<br>(80)      | 8+6<br>(8.5+6.5)    | 100<br>(100) | 7, 8, 9<br>(5, 5, 15)   | 2, 5, 0<br>(3, 2.5, 0) | 4<br>(4)     | 1000<br>(1000) | –  |

**NB:** **1:** A new class to which existing units are reassigned; **2:** A new class which currently remains unused

## 2.2.2 Mounted units

| class   | pop.<br>size | training costs<br>(f, w, m, s; time)          | loot<br>(f, w, m, s; exp)                  | vision<br>range | speed                | health       | armour<br>(h, p, c)      | damage<br>(h, p, c)       | range<br>(m) | rate<br>(ms)   | counters/<br>penalties  |
|---|--------------|---|--|-----------------|----------------------|--------------|--------------------------|---------------------------|--------------|----------------|---|
| war dog                                       | 0<br>(0)     | 75, 0, 0, 0; 10<br>(100, 0, 0, 0; 15)         | 8, 0, 0, 0; 75<br>(10, 0, 0, 0; 100)       | 60<br>(30)      | 15+15<br>(14.5+11.5) | 75<br>(90)   | 1, 2, 1<br>(1, 2, 1)     | 4, 4, 0<br>(7, 2, 0)      | 3<br>(3)     | 1000<br>(1000) | 0.75× vs Camelry, Cavalry<br>Chariotry, 0.5× vs Elephantry    |
| archer<br>camel <sup>1</sup>                  | 2<br>(1)     | 90, 40, 10, 0; 12<br>(100, 40, 0, 0; 12)      | 9, 4, 1, 0; 150<br>(10, 0, 5, 0; 130)      | 85<br>(92)      | 27+8<br>(17.5+10.5)  | 108<br>(120) | 1, 1, 5<br>(3, 1, 15)    | 0, 6, 0<br>(0, 7, 0)      | 69<br>(72)   | 1000<br>(1000) | 1.5× vs Support units<br>0.5× vs Elephantry                   |
| spear<br>camel <sup>2</sup>                   | 2<br>(1)     | 90, 40, 10, 0; 12<br>(80, 55, 0, 0; 12)       | 9, 4, 1, 0; 150<br>(10, 0, 5, 0; 130)      | 85<br>(92)      | 28+7<br>(22+18)      | 144<br>(160) | 2, 3, 5<br>(1, 1, 10)    | 0, 7, 0<br>(6, 13, 0)     | 5<br>(6)     | 1000<br>(3500) | 1.5× vs Cavalry<br>0.5× vs Elephantry                         |
| archer<br>cavalry                             | 2<br>(1)     | 100, 35, 15, 0; 14<br>(100, 40, 0, 0; 12)     | 10, 4, 1, 0; 150<br>(10, 0, 5, 0; 130)     | 80<br>(92)      | 22+8<br>(17.5+10.5)  | 120<br>(120) | 1, 1, 7<br>(3, 1, 15)    | 0, 7, 0<br>(0, 7, 0)      | 66<br>(72)   | 1000<br>(1000) | 1.5× vs Sword Cavalry<br>0.5× vs Elephantry                   |
| javelin<br>cavalry                            | 2<br>(1)     | 100, 40, 10, 0; 14<br>(100, 40, 0, 0; 12)     | 10, 4, 1, 0; 150<br>(10, 0, 5, 0; 130)     | 80<br>(92)      | 21+9<br>(17.5+10.5)  | 130<br>(120) | 1, 2, 7<br>(3, 1, 15)    | 0, 12, 0<br>(0, 18, 0)    | 27<br>(28)   | 1000<br>(1250) | 1.5× vs Chariotry<br>–  |
| axe<br>cavalry <sup>1</sup>                   | 2<br>(1)     | 100, 35, 15, 0; 14<br>(80, 35, 20, 0; 12)     | 10, 3, 2, 0; 150<br>(10, 0, 5, 0; 130)     | 80<br>(92)      | 20+10<br>(20+8.75)   | 140<br>(160) | 2, 2, 7<br>(4, 2, 15)    | 6, 0, 2<br>(6.5, 0, 0)    | 4<br>(6)     | 1000<br>(750)  | 2.0× vs Siege weapons<br>0.5× vs Elephantry <sup>0</sup>      |
| sword<br>cavalry                              | 2<br>(1)     | 100, 25, 25, 0; 14<br>(80, 35, 20, 0; 12)     | 10, 2, 3, 0; 150<br>(10, 0, 5, 0; 130)     | 80<br>(92)      | 19+11<br>(20+8.75)   | 150<br>(160) | 3, 3, 7<br>(4, 2, 15)    | 8, 0, 0<br>(6.5, 0, 0)    | 4<br>(6)     | 1000<br>(750)  | 1.5× vs Siege weapons, Sli<br>0.5× vs Elephantry <sup>0</sup> |
| spear<br>cavalry                              | 2<br>(1)     | 100, 30, 20, 0; 14<br>(80, 55, 0, 0; 12)      | 10, 3, 2, 0; 150<br>(10, 0, 5, 0; 130)     | 80<br>(92)      | 18+12<br>(22+18)     | 160<br>(160) | 5, 5, 7<br>(4, 3, 15)    | 0, 8, 0<br>(6, 13, 0)     | 4<br>(6)     | 1000<br>(3500) | 1.5× vs Ranged Infantry<br>0.5× vs Elephantry <sup>0</sup>    |
| lance<br>cavalry <sup>1</sup>                 | 2<br>(1)     | 100, 20, 30, 0; 14<br>(80, 55, 0, 0; 12)      | 10, 2, 3, 0; 150<br>(10, 0, 5, 0; 130)     | 80<br>(92)      | 17+13<br>(22+18)     | 170<br>(160) | 4, 4, 7<br>(4, 3, 15)    | 0, 8, 2<br>(6, 13, 0)     | 4<br>(6)     | 1000<br>(3500) | 1.5× vs Javelin Cavalry<br>0.5× vs Elephantry <sup>0</sup>    |
| cataphract<br>cavalry <sup>1</sup>            | 2<br>(1)     | 100, 10, 40, 0; 14<br>(80, 55, 0, 0; 12)      | 10, 1, 4, 0; 150<br>(10, 0, 5, 0; 130)     | 80<br>(92)      | 15+15<br>(22+18)     | 180<br>(160) | 7, 7, 7<br>(4, 3, 15)    | 0, 8, 4<br>(6, 13, 0)     | 4<br>(6)     | 1000<br>(3500) | 1.5× vs Archer Cavalry<br>0.5× vs Elephantry <sup>0</sup>     |
| archer<br>biga chariot <sup>1,3</sup>         | 4<br>(1)     | 200, 75, 25, 0; 16<br>(250, 100, 100, 0; 40)  | 20, 7, 3, 0; 300<br>(10, 10, 20, 0; 150)   | 80<br>(96)      | 16+9<br>(20.5+7.5)   | 200<br>(270) | 5, 3, 9<br>(7, 5, 20)    | 0, 8, 0<br>(0, 14, 0)     | 63<br>(76)   | 1000<br>(1000) | –<br>0.5× vs Elephantry                                       |
| javelin<br>biga chariot <sup>1,3</sup>        | 4<br>(1)     | 200, 80, 20, 0; 16<br>(250, 100, 100, 0; 40)  | 20, 8, 2, 0; 300<br>(10, 10, 20, 0; 150)   | 80<br>(96)      | 16+9<br>(20.5+7.5)   | 214<br>(270) | 5, 3, 9<br>(7, 5, 20)    | 0, 16, 0<br>(0, 36, 0)    | 30<br>(32)   | 1000<br>(1250) | –<br>0.5× vs Elephantry                                       |
| three-man<br>biga chariot <sup>2</sup>        | 5<br>(1)     | 250, 100, 50, 0; 16<br>(250, 100, 100, 0; 40) | 25, 10, 5, 0; 300<br>(10, 10, 20, 0; 150)  | 80<br>(96)      | 16+9<br>(20.5+7.5)   | 240<br>(270) | 5, 3, 9<br>(7, 5, 20)    | 0, 12, 0<br>(0, 14, 0)    | 63<br>(76)   | 1000<br>(1000) | –<br>0.5× vs Elephantry                                       |
| scythed<br>quadriga chariot <sup>1,3</sup>    | 6<br>(1)     | 300, 100, 50, 0; 18<br>(250, 100, 100, 0; 40) | 30, 10, 5, 0; 450<br>(10, 10, 20, 0; 150)  | 80<br>(96)      | 18+9<br>(20.5+7.5)   | 280<br>(270) | 6, 3, 9<br>(7, 5, 20)    | 0, 9, 0<br>(0, 14, 0)     | 63<br>(76)   | 1000<br>(1000) | –<br>0.5× vs Elephantry                                       |
| Indian<br>archer elephant <sup>1</sup>        | 6<br>(1)     | 300, 100, 100, 0; 24<br>(200, 80, 20, 0; 12)  | 30, 10, 10, 0; 500<br>(25, 10, 5, 0; 260)  | 90<br>(92)      | 9+9<br>(8.5+5.5)     | 450<br>(240) | 4, 7, 10<br>(4, 3, 15)   | 0, 8, 0<br>(0, 10.5, 0)   | 72<br>(72)   | 1000<br>(750)  | 1.5× vs Camelry<br>0.5× vs Elephantry                         |
| North African<br>archer elephant <sup>2</sup> | 6<br>(1)     | 300, 75, 75, 0; 20<br>(200, 80, 20, 0; 12)    | 30, 8, 8, 0; 450<br>(25, 10, 5, 0; 260)    | 90<br>(92)      | 9+9<br>(8.5+5.5)     | 360<br>(240) | 4, 7, 10<br>(4, 3, 15)   | 0, 7.2, 0<br>(0, 10.5, 0) | 72<br>(72)   | 1000<br>(750)  | 1.5× vs Camelry<br>0.5× vs Elephantry                         |
| Indian<br>war elephant <sup>1,3</sup>         | 6<br>(3)     | 300, 100, 200, 0; 24<br>(250, 0, 250, 0; 30)  | 30, 10, 20, 0; 600<br>(10, 10, 20, 0; 150) | 90<br>(100)     | 9+9<br>(8.5+5.5)     | 525<br>(750) | 6, 9, 12<br>(10, 10, 25) | 0, 0, 30<br>(20, 0, 150)  | 6<br>(8)     | 1000<br>(1500) | –<br>0.125× vs Structures                                     |
| North African<br>war elephant <sup>1,3</sup>  | 6<br>(3)     | 300, 75, 150, 0; 20<br>(250, 0, 250, 0; 30)   | 30, 8, 15, 0; 525<br>(10, 10, 20, 0; 150)  | 90<br>(100)     | 9+9<br>(8.5+5.5)     | 420<br>(750) | 6, 9, 12<br>(10, 10, 25) | 0, 0, 27<br>(20, 0, 150)  | 6<br>(8)     | 1000<br>(1500) | –<br>0.125× vs Structures                                     |

**NB: 0:** All melee cavalry (axe, sword, spear, lance, cataphract) also has a 0.75× penalty vs Camelry and Chariotry;

**1:** A new class to which existing units are reassigned; **2:** A new class which currently remains unused; **3:** Comparison values are champions

### 2.2.3 Ships

| class  | pop.<br>size | training costs<br>(f, w, m, s; time)              | loot<br>(f, w, m, s; exp)                    | garrison<br>capacity | vision<br>range | speed              | health/<br>capture | armour<br>(h, p, c)    | damage<br>(h, p, c)      | range<br>(m)  | rate<br>(ms)   | arrow<br>count  |
|--|--------------|---|--|----------------------|-----------------|--------------------|--------------------|------------------------|--------------------------|---------------|----------------|-----------------|
| fishing boat<br>(resource gatherer)          | (1)<br>(1)   | 10, 40, 0, 0; 10<br>(0, 50, 0, 0; 20)             | 1, 4, 0, 0; 5<br>(0, 10, 0, 0; 1)            | 1<br>(1)             | 60<br>(24)      | 10+2<br>(10+0)     | 150/-<br>(200/-)   | 2, 4, 2<br>(2, 5, 2)   | 10, 0, 0<br>(10, 0, 0)   | 5<br>(5)      | 1000<br>(1000) | -<br>(-)        |
| merchant ship<br>(trader)                    | 1<br>(1)     | 30, 180, 90, 0; 20<br>(0, 0, 100, 0; 20)          | 3, 18, 9, 0; 30<br>(0, 15, 0, 0; 25)         | 15<br>(15)           | 60<br>(50)      | 12+3<br>(12+0)     | 600/-<br>(400/-)   | 3, 6, 3<br>(2, 5, 2)   | -<br>(-)                 | -<br>(-)      | -<br>(-)       | -<br>(-)        |
| small barge<br>(transport) <sup>2</sup>      | 1<br>(3)     | 50, 100, 50, 0; 15<br>(0, 150, 150, 0; 40)        | 5, 10, 5, 0; 100<br>(0, 30, 20, 0; 100)      | 10<br>(40)           | 90<br>(90)      | 14+4<br>(14+4)     | 450/-<br>(1600/-)  | 4, 8, 4<br>(5, 10, 5)  | 0, 25, 0<br>(0, 25, 0)   | 60<br>(55)    | 2000<br>(2000) | 2-5<br>(3-13)   |
| medium barge<br>(transport) <sup>1</sup>     | 1<br>(3)     | 50, 200, 50, 0; 20<br>(0, 150, 150, 0; 40)        | 5, 20, 5, 0; 150<br>(0, 30, 20, 0; 100)      | 20<br>(40)           | 90<br>(90)      | 14+4<br>(14+4)     | 900/-<br>(1600/-)  | 5, 10, 5<br>(5, 10, 5) | 0, 25, 0<br>(0, 25, 0)   | 60<br>(55)    | 2000<br>(2000) | 2-8<br>(3-13)   |
| large barge<br>(transport) <sup>1</sup>      | 2<br>(3)     | 50, 400, 50, 0; 25<br>(0, 150, 150, 0; 40)        | 5, 40, 5, 0; 250<br>(0, 30, 20, 0; 100)      | 40<br>(40)           | 90<br>(90)      | 14+4<br>(14+4)     | 1800/-<br>(1600/-) | 6, 12, 6<br>(5, 10, 5) | 0, 25, 0<br>(0, 25, 0)   | 60<br>(55)    | 2000<br>(2000) | 2-14<br>(3-13)  |
| huge barge<br>(transport) <sup>2</sup>       | 3<br>(3)     | 50, 800, 50, 0; 30<br>(0, 150, 150, 0; 40)        | 5, 80, 5, 0; 450<br>(0, 30, 20, 0; 100)      | 80<br>(40)           | 90<br>(90)      | 14+4<br>(14+4)     | 3600/-<br>(1600/-) | 7, 14, 7<br>(5, 10, 5) | 0, 25, 0<br>(0, 25, 0)   | 60<br>(55)    | 2000<br>(2000) | 2-26<br>(3-13)  |
| fire ship<br>(floating bonfire)              | 0<br>(1)     | 0, 150, 0, 0; 15<br>(0, 300, 0, 0; 30)            | -<br>(-)                                     | 0<br>(0)             | 60<br>(60)      | 20+0<br>(17.5+4.5) | 450/-<br>(500/-)   | 5, 10, 5<br>(5, 10, 5) | 5, 5, 5<br>(10, 10, 10)  | 10<br>(8)     | 100<br>(100)   | -<br>(-)        |
| skiff<br>(small galley) <sup>1</sup>         | 1<br>(2)     | 60, 60, 30, 0; 10<br>(0, 125, 50, 0; 20)          | 6, 6, 3, 0; 75<br>(0, 25, 15, 0; 75)         | 6<br>(20)            | 90<br>(90)      | 18+2<br>(14+4)     | 300/-<br>(800/-)   | 5, 10, 5<br>(5, 10, 5) | 0, 25, 0<br>(0, 35, 0)   | 60<br>(45)    | 2000<br>(2000) | 1-3<br>(2-10)   |
| unireme<br>(light galley) <sup>1</sup>       | 1<br>(2)     | 100, 100, 50, 0; 15<br>(0, 125, 50, 0; 20)        | 10, 10, 5, 0; 125<br>(0, 25, 15, 0; 75)      | 10<br>(20)           | 90<br>(90)      | 17+3<br>(14+4)     | 500/-<br>(800/-)   | 5, 10, 5<br>(5, 10, 5) | 0, 25, 0<br>(0, 35, 0)   | 60<br>(45)    | 2000<br>(2000) | 1-4<br>(2-10)   |
| bireme<br>(medium galley)                    | 2<br>(2)     | 200, 200, 100, 0; 20<br>(0, 125, 50, 0; 20)       | 20, 20, 10, 0; 250<br>(0, 25, 15, 0; 75)     | 20<br>(20)           | 90<br>(90)      | 16+4<br>(14+4)     | 1000/-<br>(800/-)  | 6, 12, 6<br>(5, 10, 5) | 0, 25, 0<br>(0, 35, 0)   | 60<br>(45)    | 2000<br>(2000) | 2-8<br>(2-10)   |
| trireme<br>(medium galley)                   | 3<br>(3)     | 300, 300, 150, 0; 30<br>(0, 150, 150, 0; 25)      | 30, 30, 15, 0; 375<br>(0, 30, 20, 0; 100)    | 30<br>(30)           | 90<br>(90)      | 15+5<br>(16+4)     | 1500/-<br>(1400/-) | 6, 12, 6<br>(5, 10, 5) | 0, 25, 0<br>(0, 35, 0)   | 60<br>(55)    | 2000<br>(2000) | 3-12<br>(3-13)  |
| quadrireme<br>(medium galley) <sup>2</sup>   | 4<br>(3)     | 400, 400, 200, 0; 40<br>(0, 150, 150, 0; 25)      | 40, 40, 20, 0; 500<br>(0, 30, 20, 0; 100)    | 40<br>(30)           | 90<br>(90)      | 14+6<br>(16+4)     | 2000/-<br>(1400/-) | 6, 12, 6<br>(5, 10, 5) | 0, 25, 0<br>(0, 35, 0)   | 60<br>(55)    | 2000<br>(2000) | 4-16<br>(3-13)  |
| quinquereme<br>(heavy galley)                | 5<br>(3)     | 500, 500, 250, 0; 50<br>(0, 350, 200, 350; 30)    | 50, 50, 25, 0; 625<br>(0, 40, 30, 0; 150)    | 50<br>(50)           | 90<br>(110)     | 13+7<br>(16+4)     | 2500/-<br>(2000/-) | 7, 14, 7<br>(5, 10, 5) | 0, 25, 0<br>(0, 10, 100) | 60<br>(10-72) | 2000<br>(5000) | 5-20<br>(1-10)  |
| sexireme<br>(heavy galley) <sup>1</sup>      | 6<br>(3)     | 600, 600, 300, 0; 60<br>(0, 350, 200, 350; 30)    | 60, 60, 30, 0; 750<br>(0, 40, 30, 0; 150)    | 60<br>(50)           | 90<br>(110)     | 12+8<br>(16+4)     | 3000/-<br>(2000/-) | 7, 14, 7<br>(5, 10, 5) | 0, 25, 0<br>(0, 10, 100) | 60<br>(10-72) | 2000<br>(5000) | 6-24<br>(1-10)  |
| septireme<br>(heavy galley) <sup>1</sup>     | 7<br>(3)     | 700, 700, 350, 0; 70<br>(0, 350, 200, 350; 30)    | 70, 70, 35, 0; 875<br>(0, 40, 30, 0; 150)    | 70<br>(50)           | 90<br>(110)     | 11+9<br>(16+4)     | 3500/-<br>(2000/-) | 7, 14, 7<br>(5, 10, 5) | 0, 25, 0<br>(0, 10, 100) | 60<br>(10-72) | 2000<br>(5000) | 7-28<br>(1-10)  |
| octoreme<br>(juggernaut galley) <sup>1</sup> | 8<br>(3)     | 800, 800, 400, 0; 80<br>(0, 350, 200, 350; 30)    | 80, 80, 40, 0; 1000<br>(0, 50, 50, 0; 200)   | 80<br>(50)           | 90<br>(110)     | 10+10<br>(16+4)    | 4000/-<br>(2000/-) | 8, 16, 8<br>(5, 10, 5) | 0, 25, 0<br>(0, 10, 100) | 60<br>(10-72) | 2000<br>(5000) | 8-32<br>(1-10)  |
| novireme<br>(juggernaut galley) <sup>2</sup> | 9<br>(3)     | 900, 900, 450, 0; 90<br>(0, 350, 200, 0; 30)      | 90, 90, 45, 0; 1125<br>(0, 50, 50, 0; 200)   | 90<br>(50)           | 90<br>(110)     | 9+11<br>(16+4)     | 4500/-<br>(2000/-) | 8, 16, 8<br>(5, 10, 5) | 0, 25, 0<br>(0, 10, 100) | 60<br>(10-72) | 2000<br>(5000) | 9-36<br>(1-10)  |
| decereme<br>(juggernaut galley) <sup>1</sup> | 10<br>(8)    | 1000, 1000, 500, 0; 100<br>(0, 400, 300, 350; 20) | 100, 100, 50, 0; 1250<br>(0, 50, 50, 0; 200) | 100<br>(100)         | 90<br>(90)      | 8+12<br>(16+4)     | 5000/-<br>(4000/-) | 8, 16, 8<br>(5, 10, 5) | 0, 25, 0<br>(0, 10, 100) | 60<br>(10-72) | 2000<br>(5000) | 10-40<br>(1-10) |

**NB:** All ships are bribable (espionage); fishing boats and merchant ships are no longer “conquest critical”.

**1:** A new class to which existing units are reassigned; **2:** A new class which currently remains unused

2.2.4 Siege weapons

| class    | pop.<br>size | training costs<br>(f, w, m, s; time)         | loot<br>(f, w, m, s; exp)                 | vision<br>range | speed            | health/<br>capture   | armour<br>(h, p, c)    | damage<br>(h, p, c)       | range<br>(m)     | rate<br>(ms)   | other<br>stats   |
|----------|--------------|--|---|-----------------|------------------|----------------------|------------------------|---------------------------|------------------|----------------|--|
| ballista | 2<br>(2)     | 0, 200, 200, 0; 20<br>(0, 250, 250, 0; 20)   | 0, 20, 20, 0; 200<br>(0, 10, 10, 0; 200)  | 90<br>(120)     | 8+4<br>(8+4)     | 200/200<br>(200/500) | 1, 20, 2<br>(1, 50, 5) | 0, 120, 0<br>(0, 150, 25) | 8–80<br>(8–80)   | 3000<br>(4000) | linear splash damage:<br>0h+60p+0c (0h+75p+5c)         |
| onager   | 3<br>(2)     | 0, 300, 150, 150; 30<br>(0, 400, 0, 250; 25) | 0, 30, 15, 15; 300<br>(0, 20, 0, 10; 300) | 90<br>(120)     | 7+3<br>(7+3)     | 300/300<br>(250/500) | 1, 30, 3<br>(1, 50, 5) | 0, 0, 90<br>(0, 10, 100)  | 15–90<br>(12–80) | 3000<br>(5000) | circular splash damage:<br>0h+0p+30c (0h+15p+35c)      |
| ram      | 4<br>(3)     | 0, 400, 200, 0; 40<br>(0, 350, 200, 0; 30)   | 0, 40, 20, 0; 300<br>(0, 50, 25, 0; 60)   | 45<br>(80)      | 8+4<br>(8+3)     | 400/–<br>(400/–)     | 2, 40, 4<br>(1, 50, 5) | 0, 0, 80<br>(0, 0, 150)   | 8<br>(6.5)       | 3000<br>(1500) | garrison capacity: 10 (10)                             |
| tower    | 6<br>(3)     | 0, 600, 300, 100; 60<br>(0, 500, 300, 0; 60) | 0, 60, 30, 10; 500<br>(0, 50, 25, 0; 60)  | 90<br>(80)      | 6+3<br>(6.5+3.5) | 600/600<br>(500/500) | 3, 60, 6<br>(1, 50, 5) | 0, 10, 10<br>(0, 12, 2.5) | 60+9<br>(55+9)   | 3000<br>(2000) | garrison capacity: 20 (20)<br>arrow count: 2–12 (0–10) |

NB: ballista: onager: ram: tower:  
1.5× vs Elephantry 1.5× vs Ships 4.0× vs Gates, 2.0× vs other Structures 2.0× vs Fortresses, Towers

2.2.5 Support units

| class    | pop.<br>size | training costs<br>(f, w, m, s; time)      | loot<br>(f, w, m, s; exp)            | vision<br>range | speed             | health       | armour<br>(h, p, c)   | build<br>rate | other<br>stats  |
|----------|--------------|---|--------------------------------------|-----------------|-------------------|--------------|-----------------------|---------------|---|
| female   | 1<br>(1)     | 50, 0, 0, 0; 8<br>(50, 0, 0, 0; 8)        | 5, 0, 0, 0; 5<br>(1, 1, 1, 1; 10)    | 50<br>(32)      | 10+5<br>(9.5+6.5) | 25<br>(25)   | 1, 1, 1<br>(1, 1, 1)  | 1.0<br>(1.0)  |   |
| slave    | 1<br>(0)     | 50, 0, 50, 0; 8<br>(0, 0, 50, 0; 20)      | 5, 0, 5, 0; 10<br>(0, 1, 1, 1; 10)   | 50<br>(12)      | 10+5<br>(8+7)     | 50<br>(100)  | 1, 1, 1<br>(1, 1, 1)  | 1.0<br>(0.5)  | (unhealable, −0.25 regeneration)                            |
| healer   | 1<br>(1)     | 50, 0, 100, 0; 8<br>(250, 0, 0, 0; 8)     | 5, 0, 10, 0; 15<br>(1, 1, 1, 1; 10)  | 60<br>(30)      | 10+5<br>(9+3)     | 75<br>(85)   | 1, 1, 1<br>(1, 1, 1)  | –<br>(–)      | heal 1 HP per 0.5 seconds, 12 m range<br>(5 HP/2.0 s, 12 m) |
| trader   | 1<br>(1)     | 100, 50, 50, 0; 15<br>(100, 0, 80, 0; 15) | 10, 5, 5, 0; 20<br>(1, 1, 1, 1; 10)  | 60<br>(60)      | 10+5<br>(9.5+6.5) | 100<br>(100) | 1, 1, 1<br>(1, 1, 1)  | –<br>(–)      | briable<br>(briable)  |
| elephant | 3<br>(1)     | 300, 0, 0, 0; 12<br>(150, 0, 0, 0; 20)    | 30, 0, 0, 0; 30<br>(25, 0, 0, 0; 50) | 60<br>(50)      | 6+6<br>(5.5+4.5)  | 300<br>(300) | 3, 6, 9<br>(5, 8, 10) | 3.0<br>(2.0)  | can garrison up to 3 females<br>(no garrison capacity)      |

## 2.3 Faction availability

### 2.3.1 Infantry units

|                          | athen | brit | cart | gaul | iber | mace | maur | pers | ptol | rome | sele | spart |
|--------------------------|-------|------|------|------|------|------|------|------|------|------|------|-------|
| citizen crossbowman      | –     | –    | –    | –    | –    | –    | –    | –    | –    | –    | –    | –     |
| mercenary "              | –     | –    | –    | –    | –    | –    | –    | –    | –    | –    | –    | –     |
| champion "               | –     | –    | –    | –    | –    | –    | –    | –    | –    | –    | –    | –     |
| citizen composite bowman | –     | –    | V    | –    | –    | –    | –    | V    | –    | –    | –    | –     |
| mercenary "              | C     | –    | –    | –    | –    | T    | –    | –    | T    | –    | T    | E     |
| champion "               | C     | –    | –    | –    | –    | –    | –    | –    | –    | –    | –    | –     |
| citizen longbowman       | –     | –    | –    | –    | –    | –    | V    | –    | –    | –    | –    | –     |
| mercenary "              | –     | –    | E    | –    | –    | –    | –    | –    | –    | –    | –    | –     |
| champion "               | –     | –    | –    | –    | –    | –    | W    | –    | –    | –    | –    | –     |
| citizen bullet slinger   | V     | –    | –    | –    | –    | –    | –    | –    | V    | –    | –    | –     |
| mercenary "              | C     | –    | T    | –    | –    | T    | –    | –    | –    | –    | –    | E     |
| champion "               | –     | –    | –    | –    | –    | –    | –    | –    | –    | –    | –    | –     |
| citizen stone slinger    | –     | V    | –    | T    | T    | –    | –    | T    | –    | –    | –    | –     |
| mercenary "              | –     | –    | –    | –    | –    | –    | –    | –    | –    | –    | –    | –     |
| champion "               | –     | –    | –    | –    | –    | –    | –    | –    | –    | –    | –    | –     |
| citizen javelinist       | –     | T    | –    | V    | V    | V    | –    | T    | –    | V    | V    | V     |
| mercenary "              | T     | –    | T    | –    | –    | T    | –    | –    | T    | –    | –    | T     |
| champion "               | W     | –    | –    | –    | –    | W    | –    | C    | C    | –    | C    | W     |
| citizen throwing axeman  | –     | –    | –    | –    | –    | –    | –    | –    | –    | –    | –    | –     |
| mercenary "              | –     | –    | –    | –    | –    | –    | –    | –    | –    | –    | –    | –     |
| champion "               | –     | –    | –    | –    | –    | –    | –    | –    | –    | –    | –    | –     |
| citizen spearman         | –     | V    | –    | V    | T    | –    | V    | V    | –    | T    | V    | –     |
| mercenary "              | –     | –    | T    | –    | –    | –    | –    | –    | T    | –    | –    | –     |
| champion "               | –     | –    | –    | T    | –    | –    | –    | C    | –    | –    | –    | –     |
| citizen hoplite          | V     | –    | V    | –    | –    | –    | –    | –    | –    | –    | –    | V     |
| mercenary "              | E     | –    | T    | –    | –    | –    | –    | E    | –    | –    | –    | E     |
| champion "               | C     | –    | C    | –    | –    | C    | –    | C    | –    | –    | –    | C     |
| citizen pikeman          | –     | –    | –    | –    | –    | V    | –    | –    | V    | –    | V    | –     |
| mercenary "              | –     | –    | –    | –    | –    | –    | –    | –    | –    | –    | –    | –     |
| champion "               | –     | –    | E    | –    | –    | –    | –    | –    | C    | –    | C    | W     |
| citizen halberdier       | –     | –    | –    | –    | –    | –    | –    | –    | –    | –    | –    | –     |
| mercenary "              | –     | –    | –    | –    | –    | –    | –    | –    | –    | –    | –    | –     |
| champion "               | –     | –    | –    | –    | –    | –    | –    | –    | –    | –    | –    | –     |
| citizen axeman           | –     | –    | –    | –    | –    | –    | –    | –    | –    | –    | –    | –     |
| mercenary "              | –     | –    | –    | –    | –    | –    | –    | –    | –    | –    | –    | –     |
| champion "               | –     | –    | –    | –    | –    | –    | –    | –    | –    | –    | –    | –     |
| citizen maceman          | –     | –    | –    | –    | –    | –    | –    | –    | –    | –    | –    | –     |
| mercenary "              | –     | –    | –    | –    | –    | –    | –    | –    | –    | –    | –    | –     |
| champion "               | –     | –    | –    | –    | –    | –    | C    | –    | –    | –    | –    | –     |
| citizen curved swordsman | –     | –    | –    | –    | V    | –    | T    | –    | –    | V    | –    | –     |
| mercenary "              | –     | –    | –    | –    | –    | –    | –    | –    | –    | –    | –    | –     |
| champion "               | –     | –    | –    | –    | C    | –    | –    | –    | –    | –    | –    | –     |
| citizen longswordsman    | –     | –    | –    | –    | –    | –    | –    | –    | –    | –    | –    | –     |
| mercenary "              | E     | –    | –    | –    | –    | E    | –    | –    | –    | –    | T    | E     |
| champion "               | –     | C    | –    | –    | –    | –    | –    | –    | –    | –    | –    | –     |
| citizen short swordsman  | –     | –    | –    | –    | –    | –    | –    | –    | –    | V    | –    | T     |
| mercenary "              | –     | –    | T    | –    | –    | –    | –    | –    | T    | –    | –    | –     |
| champion "               | C     | –    | –    | C    | –    | E    | W    | –    | –    | C    | C    | E     |

**NB:** –: not available for this faction, *V*: requires village phase, *T*: requires town phase, *C*: requires city phase, *W*: requires “glorious expansion” (wonder), *E*: exists but is unavailable.



### 2.3.2 Mounted units

|                                       | athen | brit | cart | gaul | iber | mace | maur | pers | ptol | rome | sele | spart |
|---------------------------------------|-------|------|------|------|------|------|------|------|------|------|------|-------|
| citizen war dog                       | –     | –    | –    | –    | –    | –    | –    | –    | –    | –    | –    | –     |
| mercenary "                           | –     | –    | –    | –    | –    | –    | –    | –    | –    | –    | –    | –     |
| champion "                            | –     | V    | –    | –    | –    | –    | –    | –    | –    | –    | –    | –     |
| citizen archer camel                  | –     | –    | –    | –    | –    | –    | –    | –    | V    | –    | –    | –     |
| mercenary "                           | –     | –    | –    | –    | –    | –    | –    | –    | –    | –    | –    | –     |
| champion "                            | –     | –    | –    | –    | –    | –    | –    | –    | –    | –    | –    | –     |
| citizen spear camel                   | –     | –    | –    | –    | –    | –    | –    | –    | –    | –    | –    | –     |
| mercenary "                           | –     | –    | –    | –    | –    | –    | –    | –    | –    | –    | –    | –     |
| champion "                            | –     | –    | –    | –    | –    | –    | –    | –    | –    | –    | –    | –     |
| citizen archer cavalry                | –     | –    | –    | –    | –    | –    | –    | T    | –    | –    | –    | –     |
| mercenary "                           | –     | –    | –    | –    | –    | –    | –    | –    | –    | –    | T    | –     |
| champion "                            | –     | –    | –    | –    | –    | –    | –    | W    | –    | –    | –    | –     |
| citizen javelin cavalry               | V     | V    | V    | V    | V    | –    | V    | V    | –    | T    | V    | V     |
| mercenary "                           | –     | –    | T    | –    | –    | T    | –    | –    | T    | –    | –    | –     |
| champion "                            | –     | –    | –    | –    | C    | –    | –    | –    | –    | –    | –    | –     |
| citizen axe cavalry                   | –     | –    | –    | –    | –    | –    | –    | T    | –    | –    | –    | –     |
| mercenary "                           | –     | –    | T    | –    | –    | –    | –    | –    | –    | –    | –    | –     |
| champion "                            | –     | –    | –    | –    | –    | –    | –    | –    | –    | –    | –    | –     |
| citizen sword cavalry                 | T     | T    | –    | T    | –    | –    | T    | –    | –    | –    | –    | –     |
| mercenary "                           | –     | –    | T    | –    | –    | –    | –    | –    | –    | –    | –    | –     |
| champion "                            | –     | –    | –    | –    | –    | –    | –    | –    | –    | C    | –    | –     |
| citizen spear cavalry                 | –     | –    | –    | –    | –    | –    | –    | –    | –    | V    | –    | T     |
| mercenary "                           | –     | –    | T    | –    | –    | –    | –    | –    | –    | –    | –    | –     |
| champion "                            | –     | –    | C    | C    | –    | –    | –    | –    | –    | –    | –    | –     |
| citizen lance cavalry                 | –     | –    | –    | –    | –    | V    | –    | –    | –    | –    | –    | –     |
| mercenary "                           | –     | –    | –    | –    | –    | –    | –    | –    | T    | –    | T    | –     |
| champion "                            | –     | –    | –    | –    | –    | C    | –    | C    | C    | –    | –    | –     |
| citizen cataphract cavalry            | –     | –    | –    | –    | –    | –    | –    | T    | –    | –    | –    | –     |
| mercenary "                           | –     | –    | –    | –    | –    | –    | –    | –    | –    | –    | –    | –     |
| champion "                            | –     | –    | –    | –    | –    | –    | –    | –    | –    | –    | C    | –     |
| citizen archer biga chariot           | –     | –    | –    | –    | –    | –    | –    | –    | –    | –    | –    | –     |
| mercenary "                           | –     | –    | –    | –    | –    | –    | –    | –    | –    | –    | –    | –     |
| champion "                            | –     | –    | –    | –    | –    | –    | C    | –    | –    | –    | –    | –     |
| citizen javelin biga chariot          | –     | –    | –    | –    | –    | –    | –    | –    | –    | –    | –    | –     |
| mercenary "                           | –     | –    | –    | –    | –    | –    | –    | –    | –    | –    | –    | –     |
| champion "                            | –     | C    | –    | –    | –    | –    | –    | –    | –    | –    | –    | –     |
| citizen three-man biga chariot        | –     | –    | –    | –    | –    | –    | –    | –    | –    | –    | –    | –     |
| mercenary "                           | –     | –    | –    | –    | –    | –    | –    | –    | –    | –    | –    | –     |
| champion "                            | –     | –    | –    | –    | –    | –    | –    | –    | –    | –    | –    | –     |
| citizen scythed quadriga chariot      | –     | –    | –    | –    | –    | –    | –    | –    | –    | –    | –    | –     |
| mercenary "                           | –     | –    | –    | –    | –    | –    | –    | –    | –    | –    | –    | –     |
| champion "                            | –     | –    | –    | –    | –    | –    | –    | C    | –    | –    | C    | –     |
| citizen Indian archer elephant        | –     | –    | –    | –    | –    | –    | T    | –    | –    | –    | –    | –     |
| mercenary                             | –     | –    | –    | –    | –    | –    | –    | –    | –    | –    | –    | –     |
| champion                              | –     | –    | –    | –    | –    | –    | –    | –    | –    | –    | –    | –     |
| citizen North African archer elephant | –     | –    | –    | –    | –    | –    | –    | –    | –    | –    | –    | –     |
| mercenary                             | –     | –    | –    | –    | –    | –    | –    | –    | –    | –    | –    | –     |
| champion                              | –     | –    | –    | –    | –    | –    | –    | –    | –    | –    | –    | –     |
| citizen Indian war elephant           | –     | –    | –    | –    | –    | –    | –    | –    | –    | –    | –    | –     |
| mercenary "                           | –     | –    | –    | –    | –    | –    | –    | –    | –    | –    | –    | –     |
| champion "                            | –     | –    | –    | –    | –    | –    | C    | C    | –    | –    | C    | –     |
| citizen North African war elephant    | –     | –    | –    | –    | –    | –    | –    | –    | –    | –    | –    | –     |
| mercenary "                           | –     | –    | –    | –    | –    | –    | –    | –    | –    | –    | –    | –     |
| champion "                            | –     | –    | C    | –    | –    | –    | –    | –    | C    | –    | –    | –     |

**NB:** –: not available for this faction, *V*: requires village phase, *T*: requires town phase, *C*: requires city phase, *W*: requires “glorious expansion” (wonder), *E*: exists but is unavailable.

### 2.3.3 Ships

|                  | athen | brit | cart | gaul | iber | mace | maur | pers | ptol | rome | sele | spart |
|------------------|-------|------|------|------|------|------|------|------|------|------|------|-------|
| fishing boat     | V     | V    | V    | V    | V    | V    | V    | V    | V    | V    | V    | V     |
| merchant ship    | T     | T    | V    | T    | T    | T    | T    | T    | T    | T    | T    | T     |
| small transport  | –     | –    | –    | –    | –    | –    | –    | –    | –    | –    | –    | –     |
| medium transport | –     | –    | –    | –    | –    | –    | T    | –    | –    | –    | –    | –     |
| large transport  | –     | T    | –    | T    | T    | –    | T    | –    | –    | –    | –    | –     |
| huge transport   | –     | –    | –    | –    | –    | –    | –    | –    | –    | –    | –    | –     |
| fireship         | –     | –    | –    | –    | T    | –    | –    | –    | –    | –    | –    | –     |
| skiff            | –     | –    | –    | –    | –    | T    | –    | –    | –    | T    | T    | –     |
| unireme          | T     | –    | –    | –    | –    | –    | –    | T    | –    | T    | –    | T     |
| bireme           | –     | –    | T    | –    | –    | –    | –    | T    | T    | –    | –    | –     |
| trireme          | T     | –    | T    | –    | –    | T    | –    | C    | –    | T    | T    | T     |
| quadrireme       | –     | –    | C    | –    | –    | –    | –    | C    | T    | –    | C    | –     |
| quinquereme      | –     | –    | C    | –    | –    | C    | –    | –    | –    | C    | C    | –     |
| sexireme         | –     | –    | –    | –    | –    | –    | –    | –    | C    | –    | –    | –     |
| septireme        | –     | –    | –    | –    | –    | C    | –    | –    | –    | –    | –    | –     |
| octoreme         | –     | –    | –    | –    | –    | –    | –    | –    | C    | –    | –    | –     |
| novireme         | –     | –    | –    | –    | –    | –    | –    | –    | –    | –    | –    | –     |
| decereme         | –     | –    | –    | –    | –    | –    | –    | –    | C    | –    | –    | –     |

**NB:** –: not available for this faction, *V*: requires village phase, *T*: requires town phase, *C*: requires city phase, *W*: requires “glorious expansion” (wonder), *E*: exists but is unavailable.

### 2.3.4 Siege weapons

|          | athen | brit | cart | gaul | iber | mace | maur | pers | ptol | rome | sele | spart |
|----------|-------|------|------|------|------|------|------|------|------|------|------|-------|
| ballista | C     | –    | C    | –    | –    | C    | –    | –    | C    | C    | –    | C     |
| onager   | C     | –    | C    | –    | –    | C    | –    | –    | C    | C    | C    | –     |
| ram      | –     | C    | –    | C    | C    | C    | C    | C    | –    | C    | –    | C     |
| tower    | –     | –    | –    | –    | –    | C    | –    | –    | C    | –    | C    | –     |

**NB:** –: not available for this faction, *V*: requires village phase, *T*: requires town phase, *C*: requires city phase, *W*: requires “glorious expansion” (wonder), *E*: exists but is unavailable.

### 2.3.5 Support units

|          | athen | brit | cart | gaul | iber | mace | maur | pers | ptol | rome | sele | spart |
|----------|-------|------|------|------|------|------|------|------|------|------|------|-------|
| female   | V     | V    | V    | V    | V    | V    | V    | V    | V    | V    | V    | V     |
| slave    | –     | –    | –    | –    | –    | –    | –    | –    | –    | –    | –    | –     |
| healer   | T     | T    | T    | T    | T    | T    | T    | T    | T    | T    | T    | T     |
| trader   | T     | T    | T    | T    | T    | T    | T    | T    | T    | T    | T    | T     |
| elephant | –     | –    | –    | –    | –    | –    | V    | –    | –    | –    | –    | –     |

**NB:** –: not available for this faction, *V*: requires village phase, *T*: requires town phase, *C*: requires city phase, *W*: requires “glorious expansion” (wonder), *E*: exists but is unavailable.

## 2.4 Historical reality

### 2.4.1 Melee infantry

Warfare in Antiquity was often very lopsided: both sides would field heavy infantry formations against each other, until one side believed they were losing the fight, broke down, and fled; the losers would be massacred in pursuit, while the victors would win with relatively minimal casualties. Population potential generally determined the outcome of prolonged warfare: ever expanding states who could afford to lose battles (e.g. Macedon, Rome) won wars; those with stagnant growth (e.g. most Hellenistic kingdoms) often preferred to avoid all-or-nothing pitched fights and rely on naval warfare and sieges instead.

Hoplites wore a large circular shield (the *aspis*), a helmet, and a heavy, metal body armour; their primary weapon was a spear; often they also had a short sword or dagger as a secondary weapon. Hoplites were the dominant warriors of the Archaic and Classical periods. They were citizens who seldom fought more than a couple of days per year; even untrained they could easily hold their own against any opponent, thanks to their heavy armaments. The Persians often recruited large contingents of Greek mercenary hoplites; in the fourth century they even set up a corps of their own to emulate them. Their great strength was simultaneously their weakness: hoplite armour was very expensive, limiting the numbers of available troops (in city states soldiers had to provide their own weapons); inflexible, limiting their movement and speed on the battlefield; and uncomfortable, very hot in broad sunlight: hoplites would often march unarmed and only get their armour on (with the help of a servant) shortly before the actual fighting started.

Several experiments (e.g. Iphicrates) to make hoplites lighter culminated in the fourth century into the Macedonian pikemen (*phalangites*). They had long (c. 6 m) pikes (the *sarissa*), which required two hands to handle, small, crescent shaped shields (the *peltê*) attached to one arm, and often little more than a linen body armour. Although vulnerable on their own, they were invulnerable to frontal attacks when packed in their very tight (and slow) formations (unlike hoplites and swordsmen, who fought in relatively loose formations to allow moving around their weapons and falling back to ranks behind them). Soldiers were no longer independent citizens, but subjects who served for months or years and dependent on their king. The king provided them with armaments beforehand, regular meals and pay in service, and land afterwards; this allowed Macedon to quickly recruit and replace large numbers of heavy infantry. Being regular soldiers they had plenty of time to be trained, especially at forced marches; the ability to move around armies much quicker than opponents expected facilitated Alexander's world conquest.

As a result of the Celtic (Galatian) invasions of the Balkans, Greece, and Asia and directly inspired by their infantry a new, more flexible type of infantry emerged in the Greek world. Armed with a large oval shields (the *thureos*), some body armour, and short spears of various lengths and thicknesses, *thureophoroi* (medium infantry) could act both as skirmishers (light infantry), hurling javelins, and as *phalangites* (heavy infantry), forming a shieldwall and holding its ground with their thrusting spears.

In Italy, hoplite-style infantry remained in use by all peoples (Greeks, Oscans (Samnites), Umbrians (Sabines), Latins (Romans), Etruscans); a short stabbing sword (*gladius*) gradually replaced the spear (*hasta*) as the primary weapon; circular (e.g. the *clipeus*), oval, and rectangular (e.g. the *scutum*) shields were used concurrently; and the *phalanx* was abandoned in favour of similar but looser formations.

### 2.4.2 Ranged infantry

Standing at a relatively safe distance and hurling javelins at the opponents has been the typical form of tribal warfare throughout history everywhere in the world, from Neolithic times to 20th century Amazon, Africa, and Papua New Guinea; after a few men were wounded, one side would retreat. Although often dismissed as childlike, actually the combination of participation of the entire male population, several fights a year, and lack of modern medicine to prevent minor wounds from developing into dangerous infections, effectively results in something relatively more lethal than the Second World War was.

In Antiquity, light infantry was primarily used for harrassing the enemy and other auxiliary roles. Ranged infantry was notably ineffective against heavy infantry formations; their missiles were merely a nuisance, not really deadly at all. Only when the formation broke could they kill off their opponents.

Thracian style peltasts, armed with a light, crescent shaped, goatskin shield (*peltê*), two javelins (*akontia*), and a short slashing sword as a secondary weapon, were the skirmishers *par excellence* in Classical Greece; quick and agile, they excelled at ambushing and occupying, defending, or assaulting important points; unlike other light units they could fight in melee, if necessary. Although easily chased away by infantry charges or cavalry on flat terrain, they could hold their own on rough terrain (most of Armenia and Greece) and occasionally massacre cavalry or even hoplites. Their effectiveness, relatively cheapness of equipment (especially when compared to hoplites), and easy skills (hurling javelins can be learned in a day) resulted in them being the most common and popular mercenary type.

Archery has been practiced since prehistoric times to the present day. Archers have to be subdivided into three categories, depending on the type of bow.

Simple, self, flat, or longbows are basically long wooden sticks (up to 2 m) to which a bowstring is attached; they are cheap and easy to produce; many types of wood can be used, although yew (*taxus*) seems to have been preferred in Europe and bamboo in South, Southeast, and East Asia; using them requires great strength, practice, and experience.

Composite bows were invented in the late third or second millenium and could be curved or recurved; they were neither cheap nor durable: manufactured by laminating layers of horn, sinew, and wood sinew, a difficult and time consuming process, and sensitive to moisture (which explains why they never became common in Europe). Using composite bows required years of experience and significantly more skill than shooting a simple bow. The great advantage was their strength, being much shorter but at least as powerful as longbows. Composite bows were *the* weapon of choice for charioteers and horse archers, and also used by (As)syrian, Indo-Iranian (e.g. Vedic (Indic) Aryans, Medes, Parthians, Persians, Scythians, etc.), Hunnic, Turkic, and Mongol foot archers. Massed foot archers were the most effective counter against cavalry archers: they could shoot standing, sitting, hiding in the bushes, making them small targets, and from there rain down arrows on the horses, who were much smaller targets.

Composite bows existed in Mycenaean Greece, but disappeared in the Dark Ages; the archery tradition was continued in Crete and from there reintroduced to mainland Greece in the Classical times. Although Scythian and other mercenary archers were used, the Cretans were the most famous and desired archers; so great was their fame and skill that occasionally “Cretan” was used as a general Greek term for “archer” (likewise “Syrian” could be used as a general Latin term for “archer” in Imperial Roman sources).

Composite bows had an effective range of about 60 metres against individuals and over 150 metres against formations; maximum (inaccurate) range might occasionally exceed 300 metres, depending on the terrain, weather, bow, and archer. It is important to realize arrows could not penetrate body armour or heavy shields; furthermore, even hoplites could cover the effective range distance in only seconds on flat terrain.

Crossbows were invented independently in China and in the Greek world in the fifth century at the latest; the Chinese version later led to the invention of repeated crossbows, the Greek version to the ballista, catapult, and similar forms of artillery, first constructed in Syracusae in the early fourth century, and spreading from there. Strictly speaking crossbowmen are not true archers, since they do not shoot arrows, but much shorter and heavier bolts or stones instead. Greek hand-held crossbows (*gastraphetes* “belly-releaser”) were only used in siege warfare. Unlike traditional archery, skillfully using a crossbow could be learned in a week or two (which explains their popularity in the European Middle Ages (A.D.)); their much lower rate of fire (a skilled archer could perhaps launch up to a dozen arrows in the time a crossbowman required to reload and shoot once) was not really an issue during sieges.

Slinging is a skill now lost, which makes it difficult for people nowadays to get a clear idea of its effectiveness. However, Greek sources repeatedly stress that slingers had an effective range of over 200 metres and could easily outdistance and outshoot archers.

Slings were used everywhere in the Mediterranean from Neolithic times to Late Antiquity; however, it was generally the least prestigious weapon (hoplites, chariots, javelins, and archers all feature prominently in Homer’s *Iliad*; slings do not appear); a sling was an extremely cheap weapon, everyone could afford it; slingers were usually of low status, very poor, and considered rustic. Of course, there are always exceptions: the Balearic peoples, Acarnanians, Rhodians, and Judaeans were all famous for their exceptional slinging skills (boys practised from early childhood), they were proud of it, and sought after as mercenaries.

Slingers could use various forms of ammunition. Everything from fist-sized rocks of up to 500 grammes to small pebbles as light as 50 grammes could be used, rough ones picked up at the battlefield or more effective smooth stones collected in advance in river beds; Celtic hill forts with stocks of tens of thousands of sling stones are not uncommon archaeological sites in Northwestern Europe. Clay projectiles of various sizes first appear in Early Bronze Age Mesopotamia and were still produced in the Roman Empire. Small leaden bullets (of 20 to 50 grammes) were produced by Assyrians, Greeks, Romans, and others; they had the greatest range and penetrative power and were very hard to see or dodge; they were ineffective against full hoplite armour but dangerous for everyone with lighter protection.

Massed slingers, although not packed as closely as foot archers (because their slings needed space for swinging) could rain down projectiles on heavy infantry formations, forcing them to stay put, hiding behind their shields for cover. Small groups of slingers were used to chase away other slingers or archers, who lacked shields and body armour and were thus always vulnerable to projectiles.

### 2.4.3 Chariotry

The first clear evidence of animals in warfare were the donkey carts used by the Sumerians; these were undoubtedly slow, but given that everyone else was on foot, this was not a problem.

Horses were domesticated and (spoked-wheel) chariots invented in what is now Ukraine and Southern Russia; from there they were spread by the Indo-Europeans (“Aryans”) throughout Eurasia, to China in the East, the British isles in the West, and Egypt in the South; the horse-and-chariot was very fast and dominated battlefields everywhere: it was the “fighter jet” of the Bronze Age.

In the Hellenistic period there were many attempts to (re)introduce scythed chariots, but these remained ultimately unsuccessful.

#### 2.4.4 Camelry

Dromedary camels were domesticated by the Bedouin (“Arab”) tribes living in and around the Syrian desert; due to their long legs dromedary camels could easily outrun horses, making them very suitable for hit-and-run raids. The primary usage of dromedary camels, however, was maintaining supply lines and caravans in desert areas (as is still the case in the present day).

#### 2.4.5 Cavalry

The first evidence of cavalry appeared relatively late, in the Neo-Assyrian Empire; it was apparently an evolution from earlier chariot experiments; chariot crews consisted of a driver and an archer or lancer; likewise, Assyrian cavalry was organized in teams of two: one would manage the reins of both horses, the other was an armed warrior who did the fighting.

Horseback-riding existed in Greece in the Dark Ages; however, such soldiers were actually mounted infantry rather than true cavalry: they would ride to the battlefield but descent and fight on foot when the battle started. The situation in most of Europe was probably comparable; sources implicate that during the Second Punic War it was still common for Roman horsemen to descent and fight on foot. Mounted infantry and true cavalry probably coexisted for many centuries (cf. the mounted pikemen and dragoons of the Early Modern Period (post 1500 A.D.)).

The first true cavalry (men who actually fought from horseback) in the Greek world was Thessalian, starting in the eighth century; the Boeotians were also famous for their cavalry. Cavalry could be armed with throwing javelins, thrusting spears, or both, and often had a short slashing sword as a secondary weapon. Bow-and-arrows could apparently be used as well: Athens had a regular corps of 200 horse archers in 431. The lance was introduced by the Macedonians in the fourth century; Alexander seems to be the first to have used cavalry as shock troops.

The Indo-Iranian tribes (e.g. Vedic (Indic) Aryans, Medes, Parthians, Persians, Scythians, etc.) fought from horseback many centuries before: whenever they appear in historical records, they are already known and feared for their exceptional riding skills and usage of bow-and-arrow from horseback. Horse archers dominated Central Eurasian warfare until the introduction of modern rifles and cannons. They were usually light, fast, unarmoured, and could have multiple horses to be able to continue constant attacks. Much slower armoured heavy (and cataphract) horse archers (who were nearly invulnerable to arrows) developed as a counter against them and coexisted for centuries.

It is important to realize that horses throughout Antiquity were actually quite small, about the size of a pony or Przewalski’s horse. Larger breeds (Nisean horses) started in the fifth century (B.C.) but remained exceptional until the European Middle Ages (A.D.).

Horses did not like the smell of camels nor the noise of chariot wheels: unused to it, they would panic at the first encounter, but could be trained to resist their unease (cf. fireworks).

#### 2.4.6 Elephantry

Wild elephants were captured and tamed (but never domesticated) in the Indus valley as early as the fifth millennium; they were used in agriculture and as beasts of burden. An independent elephant tradition might have existed in Shang China (second millennium). True war elephants emerged in Indian warfare only in the first millennium, probably from Ceylon (Sri Lanka): the *mahout*<sup>3</sup> tradition seemed to have originated here. (Elephants were still the primary export product from Ceylon to India in the Early Modern Period when the Dutch East India Company (VOC) tried to monopolize all trades to and from Ceylon.)

Elephants were *not* living siege weapons.<sup>4</sup> Elephantry had many functions: prestige, intimidation, high and relatively safe look-out posts for generals, platforms for archers to shoot arrows from (walking towers), and protecting vulnerable infantry against cavalry charges and horse archers (horses won’t charge directly at elephants and arrows had little to none effect against war elephants); direct elephant charges at infantry formations were risky and rare.

The Indian states, the Persians, Alexander, and the Seleucids all used Asian elephants (*Elephas maximus*): Sri Lankan elephants (*E. m. maximus*) were evidently the archetypical war elephants everywhere; Indian elephants (*E. m. indicus*) were probably used in large numbers as well; Syrian elephants (*E. m. asurus*), the largest in size, were occasionally also used, but their population was quite small due to habitat loss and became totally extinct by the first century.

Ptolemaic Egypt, Epirus, Carthage, Numidia, and Kush used North African elephants (now extinct) instead; they were easier and cheaper to acquire for them than the more prestigious Asian elephants; however, all sources agree they were significantly smaller and inferior; the Seleucid war elephants easily defeated their Ptolemaic counterparts whenever they met.

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<sup>3</sup>Mahouts are the men who tamed, trained, cared for, and rode war elephants

<sup>4</sup>Have you ever seen an elephant charging head on at a large stone wall? Exactly!

## 2.5 New template structure tree

Located in /simulation/templates/; existing (overruled) templates are indicated with an asterisk (\*).

```
template_unit.xml*

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```

### 3 Structures

#### Principles

**Civic centres:** cavalry, camels, and worker elephants can no longer be trained at civic centres or crannogs (colonies can still train mercenary cavalry).

**Espionage:** civic centres, colonies, crannogs, docks, embassies, halls, libraries, markets, naval shipyards, palaces, temples, theatres, and wonders are bribable (as are all ships, traders, and heroes).

**Loot:** loot is standardized to 10% of resource costs; experience is 10% of maximum health for civic centres, colonies, crannogs, fortresses, naval shipyards, outposts, palisades, all towers, and all walls, and 5% for all other structures.

**Territory:** army camps, civic centres, colonies, crannogs, docks, naval shipyards, and outposts can be constructed in neutral territory (*unchanged*), as can corrals, farmsteads, fields, markets, storehouses, and walls (*new*; keep in mind control is quickly lost if left on their own).

**Upgradable:** (any): a long wall to gate; (town): an outpost to sentry tower; (city): a sentry tower to stone tower.

#### 3.1 Faction availability

|                   | athen | brit  | cart  | gaul  | iber  | mace  | maur  | pers  | ptol  | rome  | sele  | spart |
|-------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| civic centre      | V     | V     | V     | V     | V     | V     | V     | V     | V     | V     | V     | V     |
| house             | –     | V     | –     | V     | V     | –     | V     | –     | V     | –     | –     | –     |
| big house         | V     | –     | V     | –     | –     | V     | –     | V     | –     | V     | V     | V     |
| storehouse        | V     | V     | V     | V     | V     | V     | V     | V     | V     | V     | V     | V     |
| farmstead         | V     | V     | V     | V     | V     | V     | V     | V     | V     | V     | V     | V     |
| farm field        | V     | V     | V     | V     | V     | V     | V     | V     | V     | V     | V     | V     |
| corral            | V     | V     | V     | V     | V     | V     | V     | V     | V     | V     | V     | V     |
| docks             | V     | V     | V     | V     | V     | V     | V     | V     | V     | V     | V     | V     |
| market            | T     | T     | T     | T     | T     | T     | T     | T     | T     | T     | T     | T     |
| blacksmith        | V (T) | V (T) | V (T) | V (T) | V (T) | V (T) | V (T) | V (T) | V (T) | V (T) | V (T) | V (T) |
| temple            | T     | T     | T     | T     | T     | T     | T     | T     | T     | T     | T     | T     |
| rotary mill       | –     | T (C) | –     | T (C) | –     | –     | –     | –     | –     | –     | –     | –     |
| crannog           | –     | T     | –     | –     | –     | –     | –     | –     | –     | –     | –     | –     |
| military colony   | –     | –     | –     | –     | –     | T (–) | –     | –     | T     | T (–) | T     | –     |
| barracks          | V     | V     | V     | V     | V     | V     | V     | V     | V     | V     | V     | V     |
| outpost           | V     | V     | V     | V     | V     | V     | V     | V     | V     | V     | V     | V     |
| village palisade  | V     | V     | V     | V     | V     | V     | V     | V     | – (V) | V (–) | V     | V     |
| sentry tower      | T (V) | T (V) | T (V) | T (V) | T (V) | T (V) | T (V) | T (V) | T (V) | T (V) | T (V) | T (V) |
| town (siege) wall | T (–) | –     | T (–) | –     | –     | T (–) | –     | –     | T (–) | T (C) | T (–) | T (–) |
| defense tower     | C (T) | C (T) | C (T) | C (T) | C (T) | C (T) | C (T) | C (T) | C (T) | C (T) | C (T) | C (T) |
| city wall         | C (T) | C (T) | C (T) | C (T) | C (T) | C (T) | C (T) | C (T) | C (T) | C (T) | C (T) | C (–) |
| fortress          | C     | C     | C     | C     | C     | C     | C     | C     | C     | C     | C     | C     |
| army camp         | –     | –     | –     | –     | –     | –     | –     | –     | –     | C     | –     | –     |
| cavalry stables   | –     | –     | –     | –     | –     | –     | –     | V     | –     | –     | –     | –     |
| dog kennel        | –     | V (T) | –     | –     | –     | –     | –     | –     | –     | –     | –     | –     |
| elephant stables  | –     | –     | –     | –     | –     | –     | V (T) | –     | –     | –     | –     | –     |
| gymnasium         | T (C) | –     | –     | –     | –     | –     | –     | –     | –     | –     | –     | –     |
| mess hall         | –     | –     | –     | –     | –     | –     | –     | –     | –     | –     | –     | T (C) |
| monument          | –     | –     | –     | –     | C     | –     | –     | –     | –     | –     | –     | –     |
| naval shipyard    | –     | –     | T     | –     | –     | –     | –     | –     | –     | –     | –     | –     |
| pillar            | –     | –     | –     | –     | –     | –     | C*    | –     | –     | –     | –     | –     |
| siege workshop    | –     | –     | –     | –     | –     | C     | –     | –     | –     | –     | –     | –     |
| stoa              | T     | –     | –     | –     | –     | T (–) | –     | –     | T (–) | –     | T (–) | T     |
| tavern            | –     | –     | –     | T     | –     | –     | –     | –     | –     | –     | –     | –     |
| council chambers  | C     | –     | –     | –     | –     | –     | –     | –     | –     | –     | –     | –     |
| embassy           | –     | –     | T/T/T | –     | –     | –     | –     | –     | –     | –     | –     | –     |
| hall              | –     | –     | –     | –     | –     | –     | –     | C     | –     | –     | –     | –     |
| ishtar gate       | –     | –     | –     | –     | –     | –     | –     | C     | –     | –     | –     | –     |
| library           | –     | –     | –     | –     | –     | C     | –     | –     | C     | –     | C     | –     |
| lighthouse        | –     | –     | –     | –     | –     | –     | –     | –     | C (T) | –     | –     | –     |
| palace            | –     | –     | –     | –     | –     | –     | –     | C     | –     | –     | –     | –     |
| theatre           | C     | –     | –     | –     | –     | C     | –     | –     | C (–) | –     | C (–) | – (C) |
| Vestal temple     | –     | –     | –     | –     | –     | –     | –     | –     | –     | C     | –     | –     |
| wonder            | C     | C     | C     | C     | C     | C     | C     | C     | C     | C     | C     | C     |

**NB:** The new values are displayed normally, the default “0 A.D. Alpha XXII: Venustas” values are displayed for comparison between brackets (). –: not available for this faction, *V*: requires village phase, *T*: requires town phase, *C*: requires city phase, *W*: requires “glorious expansion” (wonder), *E*: exists but is unavailable.

### 3.2 Comparison table (structures)

| class                               | phase    | default costs<br>(f, w, m, s; time)                            | loot<br>(f, w, m, s; exp)                          | in neutral<br>territory | territory root/<br>radius/weight | pop.<br>bonus | garrison<br>capacity | health/<br>capture       | armour<br>(h, p, c)      | vision<br>range |
|-------------------------------------|----------|--|--|-------------------------|----------------------------------|---------------|----------------------|--------------------------|--------------------------|-----------------|
| brit, gaul, iber<br>centre, crannog | V        | 400, 400, 400, 400; 480<br>(0, 500, 500, 500; 500)             | 50, 50, 50, 50; 250<br>(0, 200, 200, 200; 200)     | yes                     | 1/150/10000<br>(1/140/10000)     | 20<br>(20)    | 20<br>(20)           | 2500/2500<br>(3000/2500) | 25, 35, 3<br>(25, 35, 3) | 100<br>(90)     |
| civic centre<br>(other factions)    | V        | 500, 500, 500, 500; 600<br>(0, 500, 500, 500; 500)             | 50, 50, 50, 50; 300<br>(0, 200, 200, 200; 200)     | yes                     | 1/150/10000<br>(1/140/10000)     | 25<br>(20)    | 25<br>(20)           | 3000/3000<br>(3000/2500) | 25, 35, 3<br>(25, 35, 3) | 100<br>(90)     |
| colony<br>(ptol, sele)              | T        | 300, 300, 300, 300; 360<br>(0, 200, 200, 200; 300)             | 25, 25, 25, 25; 200<br>(0, 100, 100, 100; 200)     | yes                     | 1/75/10000<br>(1/80/10000)       | 15<br>(20)    | 15<br>(20)           | 2000/2000<br>(2000/2500) | 25, 35, 3<br>(25, 35, 3) | 100<br>(90)     |
| fortress                            | C        | 200, 400, 100, 800; 450<br>(0, 0, 0, 1000; 500)                | 20, 40, 10, 80; 450<br>(0, 0, 0, 65; 100)          | no                      | 0/100/40000<br>(0/100/40000)     | 20<br>(20)    | 30<br>(20)           | 4500/4500<br>(4200/4000) | 25, 40, 6<br>(25, 40, 6) | 100<br>(80)     |
| army camp<br>(rome)                 | C        | 100, 600, 100, 0; 240<br>(0, 500, 200, 0; 250)                 | 10, 60, 10, 0; 240<br>(0, 100, 0, 0; 100)          | yes                     | –<br>–                           | 8<br>(5)      | 40<br>(40)           | 2400/1600<br>(2500/1500) | 15, 25, 2<br>(15, 25, 2) | 80<br>(60)      |
| barracks                            | V        | 100, 200, 0, 100; 200<br>(0, 300, 0, 0; 150)                   | 10, 20, 0, 10; 0<br>(0, 30, 0, 10; 0)              | no                      | 0/50/40000<br>(0/50/40000)       | 0<br>(0)      | 10<br>(10)           | 2000/500<br>(2000/500)   | 20, 35, 3<br>(20, 35, 3) | 40<br>(32)      |
| docks                               | V        | 50, 200, 0, 0; 150<br>(0, 200, 0, 0; 150)                      | 5, 20, 0, 0; 0<br>(30, 30, 0, 0; 0)                | yes                     | –                                | 5<br>(5)      | 0<br>(0)             | 2500/500<br>(2500/500)   | 20, 35, 3<br>(20, 35, 3) | 50<br>(40)      |
| naval shipyard<br>(cart)            | T        | 200, 400, 200, 200; 500<br>(0, 300, 0, 200; 500)               | 20, 40, 20, 20; 0<br>(0, 75, 0, 50; 0)             | yes                     | 1/200/25000<br>(1/200/25000)     | 10<br>(10)    | 25<br>(5)            | 5000/5000<br>(5000/2000) | 20, 40, 5<br>(20, 35, 3) | 100<br>(100)    |
| outpost tower                       | V        | 0, 75, 0, 0; 50<br>(0, 80, 0, 0; 40)                           | 0, 8, 0, 0; 0<br>(0, 8, 0, 0; 100)                 | yes                     | –                                | 0<br>(0)      | 1<br>(1)             | 750/500<br>(800/500)     | 5, 20, 1<br>(5, 20, 1)   | 100<br>(80)     |
| sentry tower                        | T<br>(V) | 50, 100, 0, 50; 100<br>(0, 100, 0, 0; 40)                      | 5, 10, 0, 5; 0<br>(0, 20, 0, 0; 100)               | no                      | 0/20/20000<br>(0/16/30000)       | 0<br>(0)      | 3<br>(3)             | 1000/750<br>(250/800)    | 15, 25, 2<br>(20, 25, 1) | 100<br>(80)     |
| stone tower                         | C<br>(T) | 50, 150, 0, 100; 150<br>(0, 100, 0, 100; 150)                  | 5, 15, 0, 10; 0<br>(0, 0, 0, 20; 100)              | no                      | 0/30/30000<br>(0/32/30000)       | 0<br>(0)      | 5<br>(5)             | 1500/1000<br>(1000/500)  | 25, 30, 3<br>(25, 30, 3) | 20<br>(20)      |
| wall short                          | C<br>(T) | 0, 20, 0, 60; 30<br>(0, 0, 0, 15; 15)                          | 0, 2, 0, 6; 0<br>(0, 0, 0, 15; 100)                | yes<br>(no)             | 0/20/60000<br>(0/20/65535)       | 0<br>(0)      | 5<br>(5)             | 2000/1200<br>(1000/1200) | 25, 30, 3<br>(25, 30, 3) | 20<br>(20)      |
| wall medium                         | C<br>(T) | 0, 30, 0, 90; 45<br>(0, 0, 0, 22; 30)                          | 0, 3, 0, 9; 0<br>(0, 0, 0, 15; 100)                | yes<br>(no)             | 0/20/60000<br>(0/20/65535)       | 0<br>(0)      | 5<br>(5)             | 3000/1200<br>(2000/1200) | 25, 30, 3<br>(25, 30, 3) | 20<br>(20)      |
| wall long                           | C<br>(T) | 0, 40, 0, 120; 60<br>(0, 0, 0, 28; 45)                         | 0, 4, 0, 12; 0<br>(0, 0, 0, 15; 100)               | yes<br>(no)             | 0/20/60000<br>(0/20/65535)       | 0<br>(0)      | 5<br>(5)             | 4000/1200<br>(3000/1200) | 25, 30, 3<br>(25, 30, 3) | 20<br>(20)      |
| wall gate                           | C<br>(T) | 0, 40, 40, 0; 15<br>(0, 0, 0, 60; 10)                          | 0, 8, 4, 12; 0<br>(0, 0, 0, 15; 100)               | yes<br>(no)             | 0/20/60000<br>(0/20/65535)       | 0<br>(0)      | 5<br>(5)             | 4000/1200<br>(3000/1200) | 25, 30, 3<br>(25, 30, 3) | 20<br>(20)      |
| wall turret                         | C<br>(T) | 0, 50, 0, 150; 75<br>(0, 0, 0, 90; 80)                         | 0, 5, 0, 15; 0<br>(0, 0, 0, 15; 100)               | yes<br>(no)             | 0/20/60000<br>(0/20/65535)       | 0<br>(0)      | 5<br>(5)             | 5000/1200<br>(4000/1200) | 25, 30, 3<br>(25, 30, 3) | 60<br>(60)      |
| library                             | C        | 250, 250, 250, 250; 500<br>(0, 0, 200, 200; 200)               | 25, 25, 25, 25; 0<br>(0, 0, 125, 125; 0)           | no                      | 0/50/50000<br>(0/50/40000)       | 0<br>(0)      | 25<br>(5)            | 2500/500<br>(2000/500)   | 20, 30, 3<br>(20, 30, 3) | 50<br>(40)      |
| theatre                             | C        | 500, 500, 500, 500; 500<br>(0, 0, 500, 500; 500)               | 50, 50, 50, 50; 0<br>(0, 0, 125, 125; 0)           | no                      | 0/100/50000<br>(0/100/40000)     | 0<br>(0)      | 50<br>(5)            | 5000/2500<br>(2000/500)  | 20, 30, 3<br>(20, 30, 3) | 100<br>(40)     |
| wonder                              | C        | 1000, 1000, 1000, 1000; 1000<br>(1000, 1000, 1000, 1000; 1000) | 100, 100, 100, 100; 0<br>(300, 300, 300, 300; 300) | no                      | 1/100/65535<br>(1/100/65535)     | 0<br>(0)      | 50<br>(30)           | 5000/2500<br>(5000/2000) | 15, 25, 3<br>(15, 25, 3) | 100<br>(72)     |



## 4 Technologies

The new values are displayed on each first row, the default “0 A.D. Alpha XXII: Venustas” values are displayed for comparison on each second row (between brackets); some files are renamed for internal consistency. All technology files are located in /simulation/data/technologies/

### 4.1 Comparison table (armoury)

| technology  | cost (f, w, m, s; time)                                    | phase             | effects  |
|---|--|-------------------|--|
| armour_cavalry_01.json<br>(armor_cavalry_01.json)       | 0, 1000, 400, 0; 40<br>(0, 1000, 350, 0; 40)               | village<br>(town) | cavalry +1 crush, hack, and pierce armour<br>(no crush, +1 hack, +1 pierce)              |
| armour_cavalry_02.json<br>(armor_cavalry_02.json)       | 0, 1000, 500, 0; 50<br>(0, 1000, 450, 0; 40)               | town<br>(city)    | cavalry +1 crush, hack, and pierce armour<br>(no crush, +1 hack, +1 pierce)              |
| armour_cavalry_03.json<br>[new]                         | 0, 1000, 600, 0; 60<br>[new]                               | city<br>[new]     | cavalry +1 crush, hack, and pierce armour<br>[new]                                       |
| armour_hero.json<br>(armor_hero_01.json)                | 0, 250, 500, 0; 60<br>(0, 0, 600, 0; 40)                   | city              | heroes +3 crush, hack, and pierce armour<br>(no crush, +2 hack, +2 pierce; +50 metal cos |
| armour_infantry_01.json<br>(armor_infantry_01.json)     | 0, 1000, 400, 0; 40<br>(0, 1000, 350, 0; 40)               | village<br>(town) | infantry +1 crush, hack, and pierce armour<br>(no crush, +1 hack, +1 pierce)             |
| armour_infantry_02.json<br>(armor_infantry_02.json)     | 0, 1000, 500, 0; 50<br>(0, 1000, 450, 0; 40)               | town<br>(city)    | infantry +1 crush, hack, and pierce armour<br>(no crush, +1 hack, +1 pierces)            |
| armour_infantry_03.json<br>[new]                        | 0, 1000, 600, 0; 60<br>[new]                               | city<br>[new]     | infantry +1 crush, hack, and pierce armour<br>[new]                                      |
| armour_ship_01.json<br>(armor_ship_reinforcedhull.json) | 0, 200, 0, 0; 40<br>(0, 250, 0, 0; 40)                     | village           | ships +2 crush, hack, and pierce armour  |
| armour_ship_02.json<br>(armor_ship_hypozomata.json)     | 0, 200, 200, 0; 40<br>(0, 150, 150, 0; 40)                 | town              | ships +2 crush, hack, and pierce armour  |
| armour_ship_03.json<br>(armor_ship_hullsheading.json)   | 0, 0, 400, 0; 60<br>(0, 0, 350, 0; 40)                     | city              | ships +2 crush, hack, and pierce armour  |
| attack_cavalry_melee_01                                 | 400, 400, 400, 0; 40<br>(500, 750, 350, 0; 40)             | village<br>(town) | melee cavalry +15% attack<br>(+20%)  |
| attack_cavalry_melee_02                                 | 500, 500, 500, 0; 50<br>(500, 500, 500, 0; 40)             | town<br>(city)    | melee cavalry +15% attack<br>(+20%)  |
| attack_cavalry_melee_03<br>[new]                        | 600, 600, 600, 0; 40<br>[new]                              | city<br>[new]     | melee cavalry +15% attack<br>[new]   |
| attack_cavalry_ranged_01                                | 400, 400, 400, 0; 40<br>(500, 750, 350; 40)                | village<br>(town) | ranged cavalry +15% attack<br>(+20%)   |
| attack_cavalry_ranged_02                                | 500, 500, 500, 0; 50<br>(500, 500, 500; 40)                | town<br>(city)    | ranged cavalry +15% attack<br>(+20%)   |
| attack_cavalry_ranged_03<br>[new]                       | 600, 600, 600, 0; 60<br>[new]                              | city<br>[new]     | ranged cavalry +15% attack<br>[new]  |
| attack_champions_elite.json                             | 0, 0, 300, 0; 40<br>(0, 0, 300, 0; 40)                     | city              | melee champions +2 hack melee attack,<br>ranged champions +2 pierce ranged attack        |
| attack_infantry_melee_01                                | 400, 400, 400, 0; 40<br>(500, 500, 250, 250; 40)           | village<br>(town) | melee infantry +15% attack<br>(+20%)   |
| attack_infantry_melee_02                                | 500, 500, 500, 0; 50<br>(500, 500, 250, 450; 40)           | town<br>(city)    | melee infantry +15% attack<br>(+20%)   |
| attack_infantry_melee_03<br>[new]                       | 600, 600, 600, 0; 60<br>[new]                              | city<br>[new]     | melee infantry +15% attack<br>[new]  |
| attack_infantry_ranged_01                               | 400, 400, 400, 0; 40<br>(500, 500, 250, 250; 40)           | village<br>(town) | ranged infantry +15% attack<br>(+20%)  |
| attack_infantry_ranged_02                               | 500, 500, 500, 0; 50<br>(500, 500, 250, 350; 40)           | town<br>(city)    | ranged infantry +15% attack<br>(+20%)  |
| attack_infantry_ranged_03<br>[new]                      | 600, 600, 600, 0; 60<br>[new]                              | city<br>[new]     | ranged infantry +15% attack<br>[new]   |
| attack_soldiers_will.json                               | 1500, 1500, 1500, 1500; 60<br>(1500, 1500, 1500, 1500; 40) | city              | soldiers +25% attack   |

## 4.2 Comparison table (economic)

| technology  | cost (f, w, m, s; time)                         | phase   | effects   |
|---|---|---------|---|
| gather_animals_stockbreeding.json                             | 100, 0, 0, 0; 45<br>(50, 0, 0, 0; 40)           | village | domestic animals −25% breed time  |
| gather_capacity_01.json<br>(gather_capacity_basket.json)      | 250, 250, 0, 0; 30<br>(300, 300, 0, 0; 40)      | village | workers +5 resource carrying capacity   |
| gather_capacity_02.json<br>(gather_capacity_wheelbarrow.json) | 500, 500, 0, 0; 45<br>(500, 500, 0, 0; 40)      | town    | workers +5 resource carrying capacity   |
| gather_capacity_03.json<br>(gather_capacity_carts.json)       | 1000, 1000, 0, 0; 60<br>(1000, 1000, 0, 0; 40)  | city    | workers +5 resource carrying capacity<br>(+10)                                |
| gather_capacity_fishing.json                                  | 200, 100, 0, 0; 30<br>(200, 100, 0, 0; 30)      | town    | fishing boats +20 food carrying capacity                                      |
| gather_farm_01.json<br>(gather_farming_plows.json)            | 0, 200, 100, 0; 40<br>(0, 200, 100, 0; 40)      | village | workers +15% food.grain farming rate  |
| gather_farm_02.json<br>(gather_farming_training.json)         | 0, 400, 200, 0; 50<br>(0, 300, 150, 0; 40)      | town    | workers +20% food.grain farming rate<br>(+15%)                                |
| gather_farm_03.json<br>(gather_farming_fertilizer.json)       | 0, 600, 300, 0; 60<br>(0, 500, 250, 0; 40)      | city    | workers +25% food.grain farming rate  |
| gather_fish_capacity.json<br>(gather_capacity_fishing.json)   | 200, 100, 0; 30<br>(200, 100, 0; 30)            | town    | fishing boats +20 food carrying capacity                                      |
| gather_fish_net.json<br>(gather_fishing_net.json)             | 0, 100, 0, 0; 30<br>(0, 100, 0, 0; 30)          | village | fishing boats +25% food.fish fishing rate<br>(+30%)                           |
| gather_lumber_01.json<br>(gather_lumbering_ironaxes.json)     | 125, 125, 50, 0; 30<br>(0, 200, 50, 0; 40)      | village | workers +20% wood.tree lumbering rate<br>(+15%)                               |
| gather_lumber_02.json<br>(gather_lumbering_strongeraxes.json) | 250, 250, 100, 0; 45<br>(0, 250, 50, 0; 40)     | town    | workers +25% wood.tree lumbering rate<br>(+15%)                               |
| gather_lumber_03.json<br>(gather_lumbering_sharpaxes.json)    | 500, 500, 200, 0; 60<br>(0, 1000, 150, 150; 40) | city    | workers +30% wood.tree lumbering rate<br>(+50%)                               |
| gather_mine_01.json<br>(gather_mining_wedgemallet.json)       | 125, 125, 50, 0; 30<br>(0, 200, 50, 0; 40)      | village | workers +20% metal.ore mining rate<br>(+15%)                                  |
| gather_mine_02.json<br>(gather_mining_shaftmining.json)       | 250, 250, 100, 0; 45<br>(0, 250, 50, 0; 40)     | town    | workers +25% metal.ore mining rate<br>(+15%)                                  |
| gather_mine_03.json<br>(gather_mining_silvermining.json)      | 500, 500, 200, 0; 60<br>(0, 1000, 150, 150; 40) | city    | workers +30% metal.ore mining rate<br>(+50%)                                  |
| gather_quarry_01.json<br>(gather_mining_servants.json)        | 125, 125, 50, 0; 30<br>(0, 200, 50, 0; 40)      | village | workers +20% stone.rock quarrying rate<br>(+15%)                              |
| gather_quarry_02.json<br>(gather_mining_serfs.json)           | 250, 250, 100, 0; 45<br>(0, 250, 50, 0; 40)     | town    | workers +25% stone.rock quarrying rate<br>(+15%)                              |
| gather_quarry_03.json<br>(gather_mining_slaves.json)          | 500, 500, 200, 0; 60<br>(0, 1000, 150, 150; 40) | city    | workers +30% stone.rock quarrying rate<br>(+50%)                              |
| gather_forage.json<br>(gather_wicker_baskets.json)            | 0, 100, 0, 0; 30<br>(0, 100, 0, 0; 40)          | village | workers +50% food.fruit foraging rate,<br>+5 food carrying capacity (+50%; 0) |
| health_females_01.json  | 100, 100, 0, 0; 30<br>(150, 0, 0, 0; 40)        | village | females +60% health<br>(+50%)   |
| trade_commercial_treaty.json                                  | 0, 0, 200, 0; 40<br>(0, 0, 100, 0; 40)          | town    | markets +0.1 [i.e. +10%] international bonus                                  |
| trade_convoy_armour.json<br>(trade_convoys_armor.json)        | 0, 200, 200, 0; 40<br>(0, 0, 200, 0; 40)        | city    | traders +2 crush, hack, and pierce armour<br>(no crush)                       |
| trade_convoy_speed.json<br>(trade_convoys_speed.json)         | 200, 0, 200, 0; 40<br>(0, 0, 200, 0; 40)        | town    | traders +10% walk speed<br>(+25%)   |
| trade_gain_01.json  | 200, 200, 200, 0; 40<br>(0, 150, 150, 0; 40)    | town    | traders +10% gain   |
| trade_gain_02.json  | 300, 300, 300, 0; 40<br>(0, 300, 300, 0; 40)    | city    | traders +15% gain   |

### 4.3 Comparison table (healing)

| technology                                | cost (f, w, m, s; time)                      | phase | effects   |
|---|--|-------|---|
| heal_barracks.json                        | 500, 0, 250, 0; 40<br>(500, 0, 250, 0; 40)   | town  | barracks +1 buff heal garrison                      |
| heal_range_01.json<br>(heal_range.json)   | 200, 0, 100, 0; 30<br>(400, 0, 200, 0; 40)   | town  | healers +3 heal range<br>(+5 heal and vision range) |
| heal_range_02.json<br>(heal_range_2.json) | 400, 0, 200, 0; 30<br>(800, 0, 400, 0; 40)   | city  | healers +3 heal range<br>(+5 heal and vision range) |
| heal_rate_01.json<br>(heal_rate.json)     | 500, 0, 250, 0; 40<br>(500, 0, 250, 0; 40)   | town  | healers −20% heal time                              |
| heal_rate_02.json<br>(heal_rate_2.json)   | 1000, 0, 500, 0; 40<br>(1000, 0, 500, 0; 40) | city  | healers −20% heal time                              |
| heal_temple.json                          | 500, 0, 250, 0; 40<br>(500, 0, 250, 0; 40)   | city  | temples +50% buff heal garrison                     |
| health_regen_units.json                   | 1000, 0, 500, 0; 60<br>(1000, 0, 250, 0; 40) | city  | idle units +0.5 health regeneration rate            |

### 4.4 Comparison table (siege)

| technology                              | cost (f, w, m, s; time)                        | phase | effects                                |
|---|--|-------|--|
| siege_armour.json<br>(siege_armor.json) | 0, 500, 250, 0; 40<br>(0, 500, 250, 0; 40)     | city  | siege weapons +2 hack armour           |
| siege_attack.json                       | 0, 1000, 500, 0; 40<br>(0, 1000, 500, 0; 40)   | city  | siege weapons +25% crush attack damage |
| siege_bolt_accuracy.json                | 0, 250, 250, 0; 40<br>(0, 250, 250, 0; 40)     | city  | bolt shooters −20% spread              |
| siege_cost_metal.json                   | 500, 500, 0, 250; 40<br>(500, 500, 0, 250; 40) | city  | siege weapons −20% metal cost          |
| siege_cost_wood.json                    | 500, 0, 500, 250; 40<br>(500, 0, 500, 250; 40) | city  | siege weapons −20% wood cost           |

### 4.5 Comparison table (structures)

| technology  | cost (f, w, m, s; time)                                    | phase             | effects   |
|---|--|-------------------|---|
| pop_house_01.json   | 0, 100, 0, 100; 40<br>(0, 300, 0, 100; 40)                 | village<br>(town) | houses +20% population  |
| pop_house_02.json   | 0, 200, 0, 200; 50<br>(0, 300, 0, 300; 40)                 | town<br>(city)    | houses +20% population  |
| pop_house_03.json<br>[new]                                    | 0, 300, 0, 300; 60<br>[new]                                | city<br>[new]     | houses +20% population<br>[new]                                   |
| pop_wonder.json   | 2000, 2000, 2000, 2000; 120<br>(2000, 3000, 500, 500; 120) | wonder            | +10% maximum population<br>each wonder (+40 (flat))               |
| tower_armour.json<br>(attack_tower_defense.json)              | 0, 500, 500, 500; 40<br>(0, 500, 500, 500; 40)             | city              | stone towers +2%<br>crush, hack, and pierce armour                |
| tower_crenellations.json<br>(attack_tower_crenellations.json) | 0, 0, 250, 500; 40<br>(0, 0, 250, 500; 40)                 | town              | all towers +40% arrows<br>per garrisoned soldier                  |
| tower_decay.json<br>(decay_outpost.json)                      | 0, 0, 0, 100; 30<br>(0, 0, 0, 100; 40)                     | village           | outposts −50% decay rate  |
| tower_murderholes.json<br>(attack_tower_murderholes.json)     | 0, 250, 0, 100; 40<br>(0, 500, 0, 100; 40)                 | city              | all towers 0 minimum attack range                                 |
| tower_range.json<br>(attack_tower_range.json)                 | 0, 500, 250, 0; 40<br>(0, 500, 250, 0; 40)                 | town              | sentry and stone towers<br>+8 m maximum attack range (and vision) |
| tower_vision.json<br>(vision_outpost.json)                    | 100, 0, 0, 0; 30<br>(100, 0, 0, 0; 40)                     | village           | all towers +20% vision range<br>(outposts +50%)                   |
| tower_watch.json<br>(attack_tower_watch.json)                 | 500, 0, 0, 0; 30<br>(500, 0, 0, 0; 40)                     | village           | sentry and stone towers<br>+1 default arrow                       |
| walls_geometric.json<br>(health_walls_geometric_masonry.json) | 0, 0, 0, 200; 40<br>(0, 0, 0, 200; 40)                     | town              | city walls +2 crush armour and<br>+20% build time (+2; +10%)      |
| walls_rubble.json<br>(buildtime_walls_rubble.json)            | 0, 200, 0, 0; 40<br>(0, 200, 0, 0; 40)                     | town              | city walls −20% build time<br>and −1 crush armour                 |

#### 4.6 Comparison table (training)

| technology                           | cost (f, w, m, s; time)                      | phase             | effects  |
|--------------------------------------|--|-------------------|--|
| drill_cavalry_01.json<br>[new]       | 300, 0, 200, 0; 30<br>[new]                  | village<br>[new]  | cavalry starts at rank 1/12<br>[new]   |
| drill_cavalry_02.json<br>[new]       | 600, 0, 400, 0; 45<br>[new]                  | town<br>[new]     | cavalry starts at rank 2/12<br>[new]   |
| drill_cavalry_03.json<br>[new]       | 900, 0, 600, 0; 60<br>[new]                  | city<br>[new]     | cavalry starts at rank 3/12<br>[new]   |
| drill_cavalry_04.json<br>[new]       | 1200, 0, 800, 0; 75<br>[new]                 | wonder<br>[new]   | cavalry starts at rank 4/12<br>[new]   |
| drill_infantry_01.json<br>[new]      | 200, 0, 200, 0; 30<br>[new]                  | village<br>[new]  | infantry starts at rank 1/12<br>[new]  |
| drill_infantry_02.json<br>[new]      | 400, 0, 400, 0; 45<br>[new]                  | town<br>[new]     | infantry starts at rank 2/12<br>[new]  |
| drill_infantry_03.json<br>[new]      | 600, 0, 600, 0; 60<br>[new]                  | city<br>[new]     | infantry starts at rank 3/12<br>[new]  |
| drill_infantry_04.json<br>[new]      | 800, 0, 800, 0; 75<br>[new]                  | wonder<br>[new]   | infantry starts at rank 4/12<br>[new]  |
| speed_horse_01<br>(speed_cavalry_01) | 300, 0, 100, 0; 40<br>(500, 500, 150, 0; 40) | village<br>(town) | cavalry and chariots +5% walk speed<br>(cavalry +10%)                            |
| speed_horse_02<br>(speed_cavalry_02) | 450, 0, 150, 0; 50<br>(500, 500, 150, 0; 40) | town<br>(city)    | cavalry and chariots +5% walk speed<br>(cavalry +10%)                            |
| speed_horse_03<br>[new]              | 600, 0, 200, 0; 60<br>[new]                  | city<br>[new]     | cavalry and chariots +5% walk speed<br>[new]                                     |
| training_conscription.json           | 500, 0, 0, 0; 40<br>(500, 0, 0, 0; 40)       | city              | barracks −0.1 [i.e. −10%]<br>batch time modifier                                 |
| training_naval_architects.json       | 200, 200, 0, 0; 40<br>(200, 200, 0, 0; 40)   | city              | docks −0.1 [i.e. −10%]<br>batch time modifier                                    |
| upgrade_rank_advanced_mercenary.json | 200, 0, 300, 0; 40<br>(200, 200, 0, 0; 40)   | town              | mercenaries +10% health, −10% gather rate<br>(advanced rank; +20% training time) |

**NB:** Each rank grants +5% health, attack damage, and capture strength, but also −10% gather rate; furthermore, melee units receive +1% movement speed and ranged units −1% ranged spread.

#### 4.7 Comparison table (miscellaneous)

| technology                   | cost (f, w, m, s; time)   | phase   | effects   |
|------------------------------|---|---------|---|
| phase_city.json              | 0, 0, 750, 750; 90<br>(0, 0, 750, 750; 60)<br>3 (4) town structures | town    | civic centres +40% territory radius, structures<br>+8.0 capturable garrisoned regeneration rate<br>(+50%; +9.0; citizen soldiers +10% health) |
| phase_town.json              | 500, 500, 0, 0; 60<br>(500, 500, 0, 0; 30)<br>5 village structures  | village | civic centres +40% territory radius, structures<br>+8.0 capturable garrisoned regeneration rate<br>(+30%; +7.0; citizen soldiers +20% health) |
| phase_village.json           | [autoresearched]  | –       |   |
| spy_counter.json             | 400, 0, 400, 0; 60<br>(400, 0, 400, 0; 60)                          | city    | +50% bribe costs  |
| unlock_champion_units.json   | 0, 0, 1000, 0; 90<br>(0, 0, 1000, 0; 90)                            | city    |   |
| unlock_females_house.json    | 250, 100, 100, 0; 60<br>(250, 100, 100, 0; 60)                      | village |   |
| unlock_shared_dropsites.json | 100, 200, 200, 100; 40<br>(200, 200, 100, 100; 40)                  | village |   |
| unlock_shared_los.json       | 100, 0, 100, 0; 40<br>(100, 0, 100, 0; 40)                          | village |   |
| unlock_spies.json            | 500, 0, 500, 0; 75<br>(500, 500, 300, 300; 80)                      | city    |   |

## 4.8 Civilization bonuses

- All are grouped in `simulation/data/technologies/civbonuses/` *[new]*
- Celtic (Briton and Gaulish) healers have +20% walk speed, +4 hack, pierce, and crush armour levels, and two more auras (“Curse” and “Motivation”), but also +100% training time, +50 metal and +5 wood costs, and +5 metal, +5 wood, and +10 experience loot. *[new]*
- Celtic (Briton and Gaulish) civic, economic, military, and resource structures have −20% health, capture points, and build time (wonders, walls, towers, and outposts are excluded). *[changed]*
- Celtic (Briton and Gaulish) walls have −20% health, build time, and stone and wood costs. *[new]*
- Celts (Britons and Gauls) have a 20% resource cost and time discount on Armoury technologies. *[new]*
- Greek (Athenians, Macedonians, Spartans) civic structures have +20% health and capture points (instead of all structures +10% health, capture points, and build time). *[changed]*
- Athenians have a 10% resource cost and time discount on Storehouse technologies. *[new]*
- Athenians no longer gain +10% metal.ore mining gather rate per phase advance. *[removed]*
- Athenian warships have +10% walk speed. *[new]*
- Briton infantry swordsmen have +10% walk speed. *[new]*
- Briton sentry towers cost no stone and have −25% construction time and −10% health. *[new]*
- Carthaginian markets (including docks) have −50% resource costs and construction time and Market (and consequently naval) technologies have a 30% resource cost and time discount. *[new]*
- Carthaginian ships have +20% vision range (instead of ships and traders +25% vision range; formerly “Exploration” unique technology, town phase, costing 200 food, 0 wood, 0 stone, 200 metal, and 60 time). *[changed]*
- Carthaginian stone walls have +25% health (instead of +100% stone cost, +100% construction time, and +200% health). *[changed]*
- Carthaginian traders have +5% gain. *[new]*
- Gaulish infantry spearmen have +10% melee attack damage. *[new]*
- Iberian infantry javelinists have +10% ranged attack damage. *[new]*
- Macedonian cavalry lancers have +10% melee attack damage. *[new]*
- Macedonian pikemen have +10% walk speed. *[new]*
- Mauryans have +10% maximum population. *[unchanged]*
- Mauryan city walls have −25% health and building time. *[changed]*
- Mauryan healers have −50% metal cost and loot. *[new]*
- Mauryan temples have −50% resource costs and construction time (former team bonus). *[new]*
- Persians have +10% maximum population. *[unchanged]*
- Persian structures have +20% territory influence radius. *[new]*
- Persian storehouses have +100% health and territory influence radius. *[new]*
- Ptolemaic farmsteads have +50% health and territory influence radius. *[new]*
- Ptolemaic healers have +6 healing range. *[new]*
- Ptolemies have a 40% resource cost and time discount on Temple technologies. *[new]*
- Roman cavalry swordsmen have a −10% melee attack damage penalty. *[new]*
- Roman infantry swordsmen have +10% melee attack damage. *[new]*
- Seleucid civic centres have −20% resource costs (former team bonus). *[new]*
- Spartans *no longer* have −10% maximum population. *[removed]*
- Spartan cavalry have a −10% attack damage penalty. *[new]*
- Spartan hoplites have +10% walk speed. *[new]*

## 4.9 Special technologies

- All are grouped in `simulation/data/technologies/special/` *[new]*
- The Agoge (Spartans) increases hoplite infantry health and training time by +20% (instead of spear infantry +25% health and +10% training time).
- Archery Tradition increases archer maximum range by +20% (from +10.0) and training time by +20% (from -20%); +10 vision range bonus and -20% health penalty are removed; also available to Seleucids (in addition to Persians and Mauryans).
- Colonization (civic structures have -25% construction time) is also available to Athenians and Spartans (in addition to Carthaginians).
- Exploration is now a free Carthaginian civilization bonus (see above), instead of a town phase technology
- Hellenistic Metropolis now costs 500 food and wood (in addition to 500 metal, 500 stone, and 60 time).
- Long Walls increase the health and resource costs of stone walls by +20% (instead of allowing city walls to be build in neutral territory).

## 4.10 Team bonuses

- All are grouped in `simulation/data/auras/teambonuses/` *[unchanged]*
- Athenian allies: warships -20% (from -25%) construction time *[changed]*
- Briton allies: units cost -2% metal *[new]*  
*formerly:* healers -20% resource costs
- Carthaginian allies: land traders -20% training time and +5% walk speed *[new]*  
*formerly:* markets +0.1 (i.e. 10%) international bonus
- Gaulish allies: infantry spearmen -20% training time *[new]*  
*formerly:* all technologies -20% research time
- Iberian allies: infantry javelinists -20% training time *[new]*  
*formerly:* citizen javelinists (infantry and cavalry) -20% resource costs
- Macedonian allies: units cost -2% wood *[new]*  
*formerly:* markets +20% sell prices
- Mauryan allies: healers -25% training time *[new]*  
*formerly:* temple technologies and temples cost -50% resources and time
- Persian allies: land traders +10% (from +15%) gain *[changed]*
- Ptolemaic allies: units cost -2% food *[new]*  
*formerly:* +1.0 food trickle rate *[unchanged]*
- Roman allies: infantry swordsmen -20% training time *[new]*  
*formerly:* all infantry -20% training time
- Seleucid allies: civic centres -20% construction time *[new]*  
*formerly:* civic centres -20% resource costs
- Spartan allies: infantry hoplites -20% training time *[new]*  
*formerly:* citizen infantry spearmen +10% health

## 4.11 Global auras

- All are grouped in `simulation/data/auras/structures/` *[unchanged]*
- Library [each]: -10% structure construction time (instead of -10% technology resource costs) and -20% technology research time *[changed]*
- Theatre [each]: +20% territory influence *[unchanged]*
- Wonder [each]: +40% territory influence *[new]*, +10.0 maximum population limit *[unchanged]*; additional +10% with “glorious expansion” researched (instead of +40.0) *[changed]*