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

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Contents

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. 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, more experience promotion ranks (0–12), and a new resource (silver).

0abc serves as a showcase for how 0 A.D. easily could be at the moment, as a playground for me experimenting with modifying the game to get used to the code structure, and as a platform for including my own opinions and views to have the game the way I like it. Being a test mod of an alpha-stage game, it is inherently imperfect, unfinished, and restricted by my limited programming skills and the files available in 0 A.D.'s latest stable release.

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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 `/0ad/mods/` folder:

  GNU/Linux (e.g. Fedora) typically: `~/.local/share/0ad/mods/`

  Macintosh/Apple OS X typically: `~/Library/Application\Support/0ad/mods/`

  Microsoft Windows typically: `~\Documents\My Games\0ad\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   Intended but not yet implemented

- Units can occupy more than one garrison slot (e.g. infantry one, cavalry two, elephants six).

- Domestic animals start at e.g. 20% of maximum food and gradually fatten to 100%.

- Fruit trees contain both food and wood; right-click to gather food, control-right-click to cut the tree and collect wood; when food is reduced to 0 it does not disappear but stays, allowing it to regrow fruit and be harvested again later; when cutting starts, the tree is killed, does not have any food any more, and completely disappears when all wood is gathered.

- Farmstead serves as a dropsite for food.fruit and food.grain (but not food.meat) and corral as a dropsite for food.meat (but not other food types).

- Trader gain is 100% silver; bartering resources is always possible, also without a market.

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.[1]

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[1] `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 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	yes

2.1.2 Soldier types

	infantry	camel	cavalry	biga chariot	quadriga chariot	North African war elephant	Indian war elephant
mercenary metal cost	+20.0	+25.0	+30.0	+50.0	+60.0	+80.0	+100.0
mercenary wood cost	+0.0	+0.0	+0.0	+0.0	+0.0	+0.0	+0.0
mercenary training time	−20%	−20%	−20%	−20%	−20%	−20%	−20%
mercenary health	+0%	+0%	+0%	+0%	+0%	+0%	+0%
mercenary armour (h, c, p)	+1.0	+1.0	+1.0	+1.0	+1.0	+1.0	+1.0
mercenary attack damage	+15%	+15%	+15%	+15%	+15%	+15%	+15%
mercenary capture strength	+0%	+0%	+0%	+0%	+0%	+0%	+0%
champion metal cost	+70.0	+90.0	+100.0	+120.0	+140.0	+160.0	+200.0
champion wood cost	+30.0	+40.0	+50.0	+60.0	+70.0	+80.0	+100.0
champion training time	+150%	+150%	+150%	+150%	+150%	+150%	+150%
champion health	+50%	+50%	+50%	+50%	+50%	+50%	+50%
champion armour (h, c, p)	+3.0	+3.0	+3.0	+3.0	+3.0	+3.0	+3.0
champion attack damage	+100%	+100%	+100%	+100%	+100%	+100%	+100%
champion capture strength	+100%	+100%	+100%	+100%	+100%	+100%	+100%

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.

2.1.3 Unit categories

	population slots occupied	standard food cost	food carry capacity	food.meat gather rate	vision range (metres)	promotion experience 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. size	training costs (f, w, m, s; time)	loot (f, w, m, s; exp)	vision range	speed	health	armour (h, p, c)	damage (h, p, c)	range (m)	rate (ms)	counters/ penalties
war dog	0	75, 0, 0, 0; 10	8, 0, 0, 0; 75	60	15+15	75	1, 2, 1	4, 4, 0	3	1000	0.75× vs Camelry, Cavalry,
	(0)	(100, 0, 0, 0; 15)	(10, 0, 0, 0; 100)	(30)	(14.5+11.5)	(90)	(1, 2, 1)	(7, 2, 0)	(3)	(1000)	Chariotry, 0.5× vs Elephantry
crossbow	1	50, 30, 20, 0; 10	5, 3, 2, 0; 100	75	8+8	50	1, 3, 5	0, 4, 2	60	1000	1.5× vs Archer Cavalry
archer infantry[2]	(1)	(50, 50, 0, 0; 10)	(5, 5, 0, 0; 100)	(80)	(8+10)	(50)	(1, 1, 10)	(0, 6, 0)	(72)	(1000)	0.5× vs Elephantry
composite bow	1	50, 35, 15, 0; 10	5, 4, 1, 0; 100	75	10+8	50	2, 2, 2	0, 6, 0	60	1000	1.5× vs Archer Cavalry
archer infantry	(1)	(50, 50, 0, 0; 10)	(5, 5, 0, 0; 100)	(80)	(8+10)	(50)	(1, 1, 10)	(0, 6, 0)	(72)	(1000)	0.5× vs Elephantry
longbow	1	50, 40, 10, 0; 10	5, 4, 1, 0; 100	75	10+8	50	2, 2, 2	0, 5, 0	60	1000	1.5× vs Archer Cavalry
archer infantry[1]	(1)	(50, 50, 0, 0; 10)	(5, 5, 0, 0; 100)	(80)	(8+10)	(50)	(1, 1, 10)	(0, 6, 0)	(72)	(1000)	0.5× vs Elephantry
lead bullet	1	50, 30, 20, 0; 10	5, 3, 2, 0; 100	75	12+8	55	1, 2, 3	0, 4, 1	75	1000	1.5× vs Archer Infantry
sling infantry	(1)	(50, 20, 0, 30; 10)	(5, 0, 0, 5; 100)	(80)	(11+13)	(50)	(1, 1, 10)	(0, 9.5, 1)	(48)	(1000)	0.125× vs Structures
sling stone	1	50, 40, 10, 0; 10	5, 4, 1, 0; 100	75	12+8	55	1, 2, 3	0, 0, 6	45	1000	1.5× vs Archer Infantry
sling infantry[1]	(1)	(50, 20, 0, 30; 10)	(5, 0, 0, 5; 100)	(80)	(11+13)	(50)	(1, 1, 10)	(0, 9.5, 1)	(48)	(1000)	0.125× vs Structures
javelin	1	50, 45, 5, 0; 10	5, 5, 0, 0; 100	75	14+8	60	2, 3, 4	0, 10, 0	30	1000	1.25× vs Archer units
infantry	(1)	(50, 50, 0, 0; 10)	(5, 5, 0, 0; 100)	(80)	(13.5+10.5)	(50)	(1, 1, 10)	(0, 16, 0)	(24)	(1250)	
throwing axe	1	50, 30, 20, 0; 10	5, 3, 2, 0; 100	75	13+5	65	3, 4, 5	9, 0, 0	15	1000	1.5× vs Spear Infantry
infantry[2]	(1)	(50, 50, 0, 0; 10)	(5, 5, 0, 0; 100)	(80)	(13.5+10.5)	(50)	(1, 1, 10)	(0, 16, 0)	(24)	(1250)	
axe	1	50, 35, 15, 0; 10	5, 4, 1, 0; 100	75	12+3	85	5, 5, 5	5, 0, 1	2	1000	1.5× vs Siege weapons,
infantry[1]	(1)	(50, 40, 10, 0; 10)	(5, 5, 0, 0; 100)	(80)	(9.5+6.5)	(100)	(5, 5, 15)	(5.5, 0, 0)	(2)	(750)	2.0× vs Elephantry
mace	1	50, 30, 20, 0; 10	5, 3, 2, 0; 100	75	11+4	90	4, 6, 8	0, 0, 8	2	1000	1.5× vs Cataphract Cavalry
infantry[1]	(1)	(50, 40, 10, 0; 10)	(5, 0, 5, 0; 100)	(80)	(9.5+6.5)	(100)	(5, 5, 15)	(0, 0, 5.5)	(2)	(750)	0.125× vs Structures
curved (sabre)	1	50, 25, 25, 0; 10	5, 2, 3, 0; 100	75	10+5	95	5, 6, 7	7, 0, 0	2	1000	–
sword infantry[1]	(1)	(50, 40, 10, 0; 10)	(5, 0, 5, 0; 100)	(80)	(9.5+6.5)	(100)	(5, 5, 15)	(5.5, 0, 0)	(2)	(750)	
two-handed	1	50, 25, 25, 0; 10	5, 2, 3, 0; 100	75	10+5	95	6, 6, 6	6, 2, 0	3	1000	–
sword infantry[1]	(1)	(50, 40, 10, 0; 10)	(5, 0, 5, 0; 100)	(80)	(9.5+6.5)	(100)	(5, 5, 15)	(5.5, 0, 0)	(2)	(750)	
short (broad)	1	50, 25, 25, 0; 10	5, 2, 3, 0; 100	75	10+5	95	6, 7, 8	4, 4, 0	2	1000	–
sword infantry	(1)	(50, 40, 10, 0; 10)	(5, 0, 5, 0; 100)	(80)	(9.5+6.5)	(100)	(5, 5, 15)	(5.5, 0, 0)	(2)	(750)	
halberd	1	50, 35, 15, 0; 10	5, 3, 2, 0; 100	75	11+4	85	5, 5, 5	3, 3, 0	3	1000	2.0× vs Cavalry
infantry[2]	(1)	(50, 50, 0, 0; 10)	(5, 5, 0, 0; 100)	(80)	(7+2)	(100)	(10, 10, 15)	(1, 3, 0)	(8)	(2000)	
spear	1	50, 40, 10, 0; 10	5, 4, 1, 0; 100	75	10+5	90	5, 6, 7	0, 6, 0	4	1000	1.25× vs Javelin units
infantry	(1)	(50, 50, 0, 0; 10)	(5, 5, 0, 0; 100)	(80)	(8.5+6.5)	(100)	(5, 5, 15)	(3, 2.5, 0)	(4)	(1000)	
hoplite	1	50, 20, 30, 0; 10	5, 2, 3, 0; 100	75	8+6	100	7, 8, 9	2, 5, 0	4	1000	2.0× vs Camelry
infantry[1]	(1)	(50, 50, 0, 0; 10)	(5, 5, 0, 0; 100)	(80)	(8.5+6.5)	(100)	(5, 5, 15)	(3, 2.5, 0)	(4)	(1000)	
pike	1	50, 45, 5, 0; 10	5, 5, 0, 0; 100	75	9+3	80	4, 5, 6	0, 5, 0	6	1000	1.25× vs Chariotry, 1.5× vs Cavalry,
infantry	(1)	(50, 50, 0, 0; 10)	(5, 5, 0, 0; 100)	(80)	(7+2)	(100)	(10, 10, 15)	(1, 3, 0)	(8)	(2000)	1.75× vs Camelry, 2.0× vs Elephantry

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. size	training costs (f, w, m, s; time)	loot (f, w, m, s; exp)	vision range	speed	health	armour (h, p, c)	damage (h, p, c)	range (m)	rate (ms)	counters/ penalties
archer camel[1]	2 (1)	90, 40, 10, 0; 12 (100, 40, 0, 0; 12)	9, 4, 1, 0; 150 (10, 0, 5, 0; 130)	85 (92)	27+8 (17.5+10.5)	108 (120)	1, 1, 5 (3, 1, 15)	0, 6, 0 (0, 7, 0)	68 (72)	1000 (1000)	1.5× vs Traders 0.5× vs Elephantry
spear camel[2]	2 (1)	90, 40, 10, 0; 12 (80, 55, 0, 0; 12)	9, 4, 1, 0; 150 (10, 0, 5, 0; 130)	85 (92)	28+7 (22+18)	144 (160)	2, 3, 5 (1, 1, 10)	0, 7, 0 (6, 13, 0)	5 (6)	1000 (3500)	1.5× vs Cavalry 0.5× vs Elephantry
crossbow cavalry[2]	2 (1)	100, 30, 20, 0; 14 (100, 40, 0, 0; 12)	10, 3, 2, 0; 150 (10, 0, 5, 0; 130)	80 (92)	16+14 (17.5+10.5)	110 (120)	2, 2, 7 (3, 1, 15)	0, 4, 2 (0, 7, 0)	64 (72)	1000 (1000)	1.25× vs Cavalry 0.5× vs Elephantry
archer cavalry	2 (1)	100, 35, 15, 0; 14 (100, 40, 0, 0; 12)	10, 4, 1, 0; 150 (10, 0, 5, 0; 130)	80 (92)	22+8 (17.5+10.5)	120 (120)	1, 1, 7 (3, 1, 15)	0, 7, 0 (0, 7, 0)	64 (72)	1000 (1000)	1.5× vs Sword Cavalry 0.5× vs Elephantry
javelin cavalry	2 (1)	100, 40, 10, 0; 14 (100, 40, 0, 0; 12)	10, 4, 1, 0; 150 (10, 0, 5, 0; 130)	80 (92)	21+9 (17.5+10.5)	130 (120)	1, 2, 7 (3, 1, 15)	0, 12, 0 (0, 18, 0)	32 (28)	1000 (1250)	1.5× vs Chariotry –
axe cavalry[1]	2 (1)	100, 35, 15, 0; 14 (80, 35, 20, 0; 12)	10, 3, 2, 0; 150 (10, 0, 5, 0; 130)	80 (92)	20+10 (20+8.75)	140 (160)	2, 2, 7 (4, 2, 15)	6, 0, 2 (6.5, 0, 0)	4 (6)	1000 (750)	1.5× vs Siege weapons 0.5× vs Elephantry[0]
sword cavalry	2 (1)	100, 25, 25, 0; 14 (80, 35, 20, 0; 12)	10, 2, 3, 0; 150 (10, 0, 5, 0; 130)	80 (92)	19+11 (20+8.75)	150 (160)	3, 3, 7 (4, 2, 15)	8, 0, 0 (6.5, 0, 0)	4 (6)	1000 (750)	1.5× vs Slinger Infantry 0.5× vs Elephantry[0]
spear cavalry	2 (1)	100, 30, 20, 0; 14 (80, 55, 0, 0; 12)	10, 3, 2, 0; 150 (10, 0, 5, 0; 130)	80 (92)	18+12 (22+18)	160 (160)	5, 5, 7 (4, 3, 15)	0, 8, 0 (6, 13, 0)	4 (6)	1000 (3500)	1.5× vs Archer Infantry 0.5× vs Elephantry[0]
lance cavalry[1]	2 (1)	100, 20, 30, 0; 14 (80, 55, 0, 0; 12)	10, 2, 3, 0; 150 (10, 0, 5, 0; 130)	80 (92)	17+13 (22+18)	170 (160)	4, 4, 7 (4, 3, 15)	0, 8, 2 (6, 13, 0)	4 (6)	1000 (3500)	1.5× vs Javelin Infantry 0.5× vs Elephantry[0]
cataphract cavalry[1]	2 (1)	100, 10, 40, 0; 14 (80, 55, 0, 0; 12)	10, 1, 4, 0; 150 (10, 0, 5, 0; 130)	80 (92)	15+15 (22+18)	180 (160)	7, 7, 7 (4, 3, 15)	0, 8, 4 (6, 13, 0)	4 (6)	1000 (3500)	1.5× vs Archer Cavalry 0.5× vs Elephantry[0]
archer biga chariot[1,3]	4 (1)	200, 80, 40, 0; 16 (250, 100, 100, 0; 40)	20, 8, 4, 0; 320 (10, 10, 20, 0; 150)	80 (96)	16+9 (20.5+7.5)	200 (270)	5, 3, 9 (7, 5, 20)	0, 8, 0 (0, 14, 0)	64 (76)	1000 (1000)	– 0.5× vs Elephantry
javelin biga chariot[1,3]	4 (1)	200, 90, 30, 0; 16 (250, 100, 100, 0; 40)	20, 9, 3, 0; 320 (10, 10, 20, 0; 150)	80 (96)	16+9 (20.5+7.5)	214 (270)	5, 3, 9 (7, 5, 20)	0, 16, 0 (0, 36, 0)	32 (32)	1000 (1250)	– 0.5× vs Elephantry
three-man biga chariot[2]	5 (1)	250, 120, 50, 0; 16 (250, 100, 100, 0; 40)	25, 12, 5, 0; 420 (10, 10, 20, 0; 150)	80 (96)	16+9 (20.5+7.5)	240 (270)	5, 3, 9 (7, 5, 20)	0, 12, 0 (0, 14, 0)	64 (76)	1000 (1000)	– 0.5× vs Elephantry
scythed quadriga chariot[1,3]	6 (1)	300, 90, 60, 0; 18 (250, 100, 100, 0; 40)	30, 8, 6, 0; 450 (10, 10, 20, 0; 150)	80 (96)	18+9 (20.5+7.5)	280 (270)	6, 3, 9 (7, 5, 20)	0, 9, 0 (0, 14, 0)	64 (76)	1000 (1000)	– 0.5× vs Elephantry
Indian archer elephant[1]	6 (1)	300, 100, 100, 0; 24 (200, 80, 20, 0; 12)	30, 10, 10, 0; 500 (25, 10, 5, 0; 260)	90 (92)	9+9 (8.5+5.5)	450 (240)	4, 7, 10 (4, 3, 15)	0, 8, 0 (0, 10.5, 0)	72 (72)	1000 (750)	1.5× vs Camelry 0.5× vs Elephantry[1]
North African archer elephant[2]	6 (1)	300, 80, 80, 0; 20 (200, 80, 20, 0; 12)	30, 8, 8, 0; 450 (25, 10, 5, 0; 260)	90 (92)	9+9 (8.5+5.5)	360 (240)	4, 7, 10 (4, 3, 15)	0, 7.2, 0 (0, 10.5, 0)	72 (72)	1000 (750)	1.5× vs Camelry 0.5× vs Elephantry
Indian war elephant[1,3]	6 (3)	300, 50, 100, 0; 24 (250, 0, 250, 0; 30)	30, 10, 20, 0; 600 (10, 10, 20, 0; 150)	90 (100)	9+9 (8.5+5.5)	525 (750)	6, 9, 12 (10, 10, 25)	0, 0, 30 (20, 0, 150)	6 (8)	1000 (1500)	– 0.125× vs Structures
North African war elephant[1,3]	6 (3)	300, 40, 80, 0; 20 (250, 0, 250, 0; 30)	30, 8, 15, 0; 525 (10, 10, 20, 0; 150)	90 (100)	9+9 (8.5+5.5)	420 (750)	6, 9, 12 (10, 10, 25)	0, 0, 27 (20, 0, 150)	6 (8)	1000 (1500)	– 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. size	training costs (f, w, m, s; time)	loot (f, w, m, s; exp)	garrison capacity	vision range	speed	health/ capture	armour (h, p, c)	damage (h, p, c)	range (m)	rate (ms)	arrow count
fishing boat	(1)	10, 40, 0, 0; 10	1, 4, 0, 0; 5	1	60	10+2	150/–	2, 4, 2	10, 0, 0	5	1000	–
(resource gatherer)	(1)	(0, 50, 0, 0; 20)	(0, 10, 0, 0; 1)	(1)	(24)	(10+0)	(200/–)	(2, 5, 2)	(10, 0, 0)	(5)	(1000)	(–)
merchant ship	1	30, 180, 90, 0; 20	3, 18, 9, 0; 30	15	75	12+3	600/–	3, 6, 3	–	–	–	–
(trader)	(1)	(0, 0, 100, 0; 20)	(0, 15, 0, 0; 25)	(15)	(50)	(12+0)	(400/–)	(2, 5, 2)	(–)	(–)	(–)	(–)
small barge	1	50, 100, 50, 0; 15	5, 10, 5, 0; 100	10	100	14+4	450/–	4, 8, 4	0, 25, 0	60	2000	2–5
(transport) [2]	(3)	(0, 150, 150, 0; 40)	(0, 30, 20, 0; 100)	(40)	(90)	(14+4)	(1600/–)	(5, 10, 5)	(0, 25, 0)	(55)	(2000)	(3–13)
medium barge	1	50, 200, 50, 0; 20	5, 20, 5, 0; 150	20	100	14+4	900/–	5, 10, 5	0, 25, 0	60	2000	2–8
(transport) [1]	(3)	(0, 150, 150, 0; 40)	(0, 30, 20, 0; 100)	(40)	(90)	(14+4)	(1600/–)	(5, 10, 5)	(0, 25, 0)	(55)	(2000)	(3–13)
large barge	2	50, 400, 50, 0; 25	5, 40, 5, 0; 250	40	100	14+4	1800/–	6, 12, 6	0, 25, 0	60	2000	2–14
(transport) [1]	(3)	(0, 150, 150, 0; 40)	(0, 30, 20, 0; 100)	(40)	(90)	(14+4)	(1600/–)	(5, 10, 5)	(0, 25, 0)	(55)	(2000)	(3–13)
huge barge	3	50, 800, 50, 0; 30	5, 80, 5, 0; 450	80	100	14+4	3600/–	7, 14, 7	0, 25, 0	60	2000	2–26
(transport) [2]	(3)	(0, 150, 150, 0; 40)	(0, 30, 20, 0; 100)	(40)	(90)	(14+4)	(1600/–)	(5, 10, 5)	(0, 25, 0)	(55)	(2000)	(3–13)
fire ship	0	0, 150, 0, 0; 15	–	0	60	20+0	450/–	5, 10, 5	5, 5, 5	10	100	–
(floating bonfire)	(1)	(0, 300, 0, 0; 30)	(–)	(0)	(60)	(17.5+4.5)	(500/–)	(5, 10, 5)	(10, 10, 10)	(8)	(100)	(–)
skiff	1	60, 60, 30, 0; 10	6, 6, 3, 0; 75	6	100	18+2	300/–	5, 10, 5	0, 25, 0	60	2000	1–3
(small galley) [1]	(2)	(0, 125, 50, 0; 20)	(0, 25, 15, 0; 75)	(20)	(90)	(14+4)	(800/–)	(5, 10, 5)	(0, 35, 0)	(45)	(2000)	(2–10)
unireme	1	100, 100, 50, 0; 15	10, 10, 5, 0; 125	10	100	17+3	500/–	5, 10, 5	0, 25, 0	60	2000	1–4
(light galley) [1]	(2)	(0, 125, 50, 0; 20)	(0, 25, 15, 0; 75)	(20)	(90)	(14+4)	(800/–)	(5, 10, 5)	(0, 35, 0)	(45)	(2000)	(2–10)
bireme	2	200, 200, 100, 0; 20	20, 20, 10, 0; 250	20	100	16+4	1000/–	6, 12, 6	0, 25, 0	60	2000	2–8
(medium galley)	(2)	(0, 125, 50, 0; 20)	(0, 25, 15, 0; 75)	(20)	(90)	(14+4)	(800/–)	(5, 10, 5)	(0, 35, 0)	(45)	(2000)	(2–10)
trireme	3	300, 300, 150, 0; 30	30, 30, 15, 0; 375	30	100	15+5	1500/–	6, 12, 6	0, 25, 0	60	2000	3–12
(medium galley)	(3)	(0, 150, 150, 0; 25)	(0, 30, 20, 0; 100)	(30)	(90)	(16+4)	(1400/–)	(5, 10, 5)	(0, 35, 0)	(55)	(2000)	(3–13)
quadrireme	4	400, 400, 200, 0; 40	40, 40, 20, 0; 500	40	100	14+6	2000/–	6, 12, 6	0, 25, 0	60	2000	4–16
(medium galley) [2]	(3)	(0, 150, 150, 0; 25)	(0, 30, 20, 0; 100)	(30)	(90)	(16+4)	(1400/–)	(5, 10, 5)	(0, 35, 0)	(55)	(2000)	(3–13)
quinquereme	5	500, 500, 250, 0; 50	50, 50, 25, 0; 625	50	100	13+7	2500/–	7, 14, 7	0, 25, 0	60	2000	5–20
(heavy galley)	(3)	(0, 350, 200, 350; 30)	(0, 40, 30, 0; 150)	(50)	(110)	(16+4)	(2000/–)	(5, 10, 5)	(0, 10, 100)	(10–72)	(5000)	(1–10)
sexireme	6	600, 600, 300, 0; 60	60, 60, 30, 0; 750	60	100	12+8	3000/–	7, 14, 7	0, 25, 0	60	2000	6–24
(heavy galley) [1]	(3)	(0, 350, 200, 350; 30)	(0, 40, 30, 0; 150)	(50)	(110)	(16+4)	(2000/–)	(5, 10, 5)	(0, 10, 100)	(10–72)	(5000)	(1–10)
septireme	7	700, 700, 350, 0; 70	70, 70, 35, 0; 875	70	100	11+9	3500/–	7, 14, 7	0, 25, 0	60	2000	7–28
(heavy galley) [1]	(3)	(0, 350, 200, 350; 30)	(0, 40, 30, 0; 150)	(50)	(110)	(16+4)	(2000/–)	(5, 10, 5)	(0, 10, 100)	(10–72)	(5000)	(1–10)
octoreme	8	800, 800, 400, 0; 80	80, 80, 40, 0; 1000	80	100	10+10	4000/–	8, 16, 8	0, 25, 0	60	2000	8–32
(juggernaut galley) [1]	(3)	(0, 350, 200, 350; 30)	(0, 50, 50, 0; 200)	(50)	(110)	(16+4)	(2000/–)	(5, 10, 5)	(0, 10, 100)	(10–72)	(5000)	(1–10)
novireme	9	900, 900, 450, 0; 90	90, 90, 45, 0; 1125	90	100	9+11	4500/–	8, 16, 8	0, 25, 0	60	2000	9–36
(juggernaut galley) [2]	(3)	(0, 350, 200, 0; 30)	(0, 50, 50, 0; 200)	(50)	(110)	(16+4)	(2000/–)	(5, 10, 5)	(0, 10, 100)	(10–72)	(5000)	(1–10)
decereme	10	1000, 1000, 500, 0; 100	100, 100, 50, 0; 1250	100	100	8+12	5000/–	8, 16, 8	0, 25, 0	60	2000	10–40
(juggernaut galley) [1]	(8)	(0, 400, 300, 350; 20)	(0, 50, 50, 0; 200)	(100)	(90)	(16+4)	(4000/–)	(5, 10, 5)	(0, 10, 100)	(10–72)	(5000)	(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 un/pack (ms)	pop. size	training costs (f, w, m, s; time)	loot (f, w, m, s; exp)	vision range packed/unpacked	speed	health	armour (h, p, c)	damage (h, p, c)	range (m)	rate (ms)	other stats
scorpion 6000 (5000)	1 (2)	50, 100, 100, 0; 10 (0, 250, 250, 0; 20)	5, 10, 10, 0; 125 (0, 10, 10, 0; 200)	50/100 (120)	9+3 (8+4)	125 (200)	1, 10, 1 (1, 50, 5)	0, 60, 0 (0, 180, 13)	5–90 (8–88)	3000 (4000)	– (linear splash damage removed: 0h+75p+5c)
bolt shooter 9000 (10000)	2 (2)	100, 200, 200, 0; 20 (0, 250, 250, 0; 20)	10, 20, 20, 0; 250 (0, 10, 10, 0; 200)	50/100 (120)	9+3 (8+4)	250 (200)	1, 20, 2 (1, 50, 5)	0, 120, 0 (0, 150, 25)	10–90 (8–80)	3000 (4000)	1.5× vs Elephantry (linear splash damage removed: 0h+75p+5c)
stone thrower 12000 (10000)	3 (2)	150, 300, 150, 150; 30 (0, 400, 0, 250; 25)	15, 30, 15, 15; 375 (0, 20, 0, 10; 300)	50/100 (120)	9+3 (7+3)	375 (250)	1, 30, 3 (1, 50, 5)	0, 0, 30 (0, 10, 100)	15–90 (12–80)	3000 (5000)	1.5× vs Ships circular splash damage: 0h+0p+90c (0h+15p+35c)
battering ram	4 (3)	200, 400, 200, 0; 40 (0, 350, 200, 0; 30)	20, 40, 20, 0; 400 (0, 50, 25, 0; 60)	50 (80)	8+2 (8+3)	500 (400)	2, 40, 4 (1, 50, 5)	0, 0, 80 (0, 0, 150)	8 (6.5)	3000 (1500)	4.0× vs Gates, 2.0× vs other Structures garrison capacity: 10 (10)
siege tower	6 (3)	300, 750, 300, 150; 60 (0, 500, 300, 0; 60)	30, 75, 30, 15; 750 (0, 50, 25, 0; 60)	100 (80)	6+2 (6.5+3.5)	750 (500)	3, 60, 6 (1, 50, 5)	0, 10, 10 (0, 12, 2.5)	60+9 (55+9)	3000 (2000)	2.0× vs Fortifications arrow count: 2–12 (0–10) garrison capacity: 20 (20)

NB: All siege weapons are not capturable anymore.

2.2.5 Support units

class	pop. size	training costs (f, w, m, s; time)	loot (f, w, m, s; exp)	vision range	speed	health	armour (h, p, c)	build rate	other stats
female	1 (1)	50, 0, 0, 0; 8 (50, 0, 0, 0; 8)	5, 0, 0, 0; 5 (1, 1, 1, 1; 10)	50 (32)	10+5 (9.5+6.5)	40 (25)	1, 1, 1 (1, 1, 1)	1.0 (1.0)	
slave	1 (0)	50, 0, 50, 0; 8 (0, 0, 50, 0; 20)	5, 0, 5, 0; 10 (0, 1, 1, 1; 10)	50 (12)	10+5 (8+7)	50 (100)	1, 1, 1 (1, 1, 1)	1.0 (0.5)	(unhealable, −0.25 regeneration)
healer	1 (1)	50, 0, 100, 0; 8 (250, 0, 0, 0; 8)	5, 0, 10, 0; 15 (1, 1, 1, 1; 10)	60 (30)	10+5 (9+3)	75 (85)	1, 1, 1 (1, 1, 1)	– (–)	heal 1 HP per 0.5 seconds, 12 m range (5 HP/2.0 s, 12 m)
trader	1 (1)	100, 50, 50, 0; 15 (100, 0, 80, 0; 15)	10, 5, 5, 0; 20 (1, 1, 1, 1; 10)	60 (60)	10+5 (9.5+6.5)	100 (100)	1, 1, 1 (1, 1, 1)	– (–)	bribable (bribable)
elephant	3 (1)	300, 0, 0, 0; 12 150, 0, 0, 0; 20	30, 0, 0, 0; 30 (25, 0, 0, 0; 50)	60 (50)	6+6 (5.5+4.5)	300 300	3, 6, 9 (5, 8, 10)	3.0 (2.0)	can garrison up to 3 females (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 war dog	–	–	–	–	–	–	–	–	–	–	–	–
mercenary ”	–	–	–	–	–	–	–	–	–	–	–	–
champion ”	–	V	–	–	–	–	–	–	–	–	–	–
citizen crossbowman	–	–	–	–	–	–	–	–	–	–	–	–
mercenary ”	–	–	–	–	–	–	–	–	–	–	–	–
champion ”	–	–	–	–	–	C (–)	–	–	–	–	–	–
citizen composite bowman	–	–	V	–	–	–	–	V	–	–	–	–
mercenary ”	C	–	–	–	–	T	–	–	T	–	T	T
champion ”	C	–	–	–	–	–	–	–	–	–	–	–
citizen longbowman	–	–	–	–	–	–	V	–	–	–	–	–
mercenary ”	–	–	T	–	–	–	–	–	–	–	–	–
champion ”	–	–	–	–	–	–	E	–	–	–	–	–
citizen bullet slinger	V	–	–	–	–	–	–	–	V	–	–	–
mercenary ”	C	–	T	–	–	T	–	–	–	–	–	T
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 ”	U	–	–	–	–	U	–	C	C	–	C	U
citizen throwing axeman	–	–	–	–	–	–	–	–	–	–	–	–
mercenary ”	–	–	–	–	–	–	–	–	–	–	–	–
champion ”	–	–	–	–	–	–	–	–	–	–	–	–
citizen axeman	–	–	–	–	–	–	–	–	–	–	–	–
mercenary ”	–	–	–	–	–	–	–	–	–	–	–	–
champion ”	–	–	–	–	–	–	–	–	–	–	–	–
citizen maceman	–	–	–	–	–	–	–	–	–	–	–	–
mercenary ”	–	–	–	–	–	–	–	–	–	–	–	–
champion ”	–	–	–	–	–	–	C	–	–	–	–	–
citizen curved swordsman	–	–	–	–	V	–	T	–	–	V	–	–
mercenary ”	–	–	–	–	–	–	–	–	–	–	–	–
champion ”	–	–	–	–	U	–	–	–	–	–	–	–
citizen longswordsman	–	–	–	–	–	–	–	–	–	–	–	–
mercenary ”	T	–	–	–	–	T	–	–	–	–	T	T
champion ”	–	U	–	–	–	–	–	–	–	–	–	–
citizen short swordsman	–	–	–	–	–	–	–	–	–	V	–	T
mercenary ”	–	–	T	–	–	–	–	–	T	–	–	–
champion ”	U	–	–	U	–	E	E	–	–	U	U	E
citizen halberdier	–	–	–	–	–	–	–	–	–	–	–	–
mercenary ”	–	–	–	–	–	–	–	–	–	–	–	–
champion ”	–	–	–	–	–	–	–	–	–	–	–	–
citizen spearman	–	V	–	V	T	–	V	V	–	T	V	–
mercenary ”	–	–	T	–	–	–	–	–	T	–	–	–
champion ”	–	–	–	T	–	–	–	C	–	–	–	–
citizen hoplite	V	–	V	–	–	–	–	–	–	–	–	V
mercenary ”	T	–	T	–	–	–	–	T	–	–	–	T
champion ”	C	–	C	–	–	C	–	C	–	–	–	C
citizen pikeman	–	–	–	–	–	V	–	–	V	–	V	–
mercenary ”	–	–	–	–	–	–	–	–	–	–	–	–
champion ”	–	–	E	–	–	–	–	–	C	–	U	E

NB: –: not available for this faction, *V*: requires village phase, *T*: requires town phase, *C*: requires city phase, *U*: requires a city phase "unlock" technology, *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 archer camel	–	–	–	–	–	–	–	–	V	–	–	–
mercenary ”	–	–	–	–	–	–	–	–	–	–	–	–
champion ”	–	–	–	–	–	–	–	–	–	–	–	–
citizen spear camel	–	–	–	–	–	–	–	–	–	–	–	–
mercenary ”	–	–	–	–	–	–	–	–	–	–	–	–
champion ”	–	–	–	–	–	–	–	–	–	–	–	–
citizen crossbow cavalry	–	–	–	–	–	–	–	–	–	–	–	–
mercenary ”	–	–	–	–	–	–	–	–	–	–	–	–
champion ”	–	–	–	–	–	–	–	–	–	–	–	–
citizen archer cavalry	–	–	–	–	–	–	–	T	–	–	–	–
mercenary ”	–	–	–	–	–	–	–	–	–	–	T	–
champion ”	–	–	–	–	–	–	–	U	–	–	–	–
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	–	U	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, *U*: requires a city phase "unlock" technology, *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 war barge	–	–	–	–	–	–	–	–	–	–	–	–
medium war barge	–	–	–	–	–	–	T	–	–	–	–	–
large war barge	–	T	–	T	T	–	T	–	–	–	–	–
huge war barge	–	–	–	–	–	–	–	–	–	–	–	–
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	–	–	–	–	U	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, *U*: requires a city phase "unlock" technology, *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
scorpion	–	–	–	–	–	–	–	–	–	C	–	–
bolt shooter	C	–	C	–	–	C	–	–	C	–	–	C
stone thrower	C	–	C	–	–	C	–	–	C	C	C	–
battering ram	–	C	–	C	C	C	C	C	–	C	–	C
siege tower	–	–	–	–	–	C	–	–	C	–	C	–

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

2.3.6 Heroes

	athen	brit	cart	gaul	iber	mace	maur	pers	ptol	rome	sele	spart
healer	–	–	–	–	–	–	V	–	–	–	–	–
archer infantry	–	–	–	–	–	–	–	V	V	–	–	–
javelin infantry	V	–	–	–	–	–	–	–	–	–	–	–
spear infantry	–	–	–	V	–	–	–	–	–	–	–	–
pike infantry	–	–	–	–	–	E	–	–	–	–	–	–
hoplite infantry	V	–	–	–	–	–	–	–	–	–	–	V/V
sword infantry	V	V/E/E	–	V	V/V	V/E	–	–	–	–	–	V
sword cavalry	–	V	V	V	–	V	–	–	V	V/V/V	V	–
spear cavalry	–	–	V	–	V	V/E	–	V	–	–	V	–
javelin chariot	–	V	–	–	–	–	–	–	–	–	–	–
archer chariot	–	–	–	–	–	–	V	V/E	–	–	–	–
war elephant	–	–	V	–	–	–	V	–	V	–	V	–

NB: –: not available for this faction, *V*: requires village phase, *T*: requires town phase, *C*: requires city phase, *U*: requires a city phase "unlock" technology, *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 holdings 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 Mycenean 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 occassionally "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 occassionally 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 horts 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 eight 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 milennium; they were used in agriculture and as beasts of burden. An independent elephant tradition might have existed in Shang China (second milennium). True war elephants emerged in Indian warfare only in the first milennium, probably from Ceylon (Sri Lanka): the *mahout*[2] 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.[3] 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 occassionally 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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[2]Mahouts are the men who tamed, trained, cared for, and rode war elephants
[3]Have you have 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 (*).

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3 Structures

Principles

Centres: cavalry, camels, and worker elephants can no longer be trained at centres or crannogs.

Espionage: centres, crannogs, docks, harbours, libraries, markets, palaces, temples, theatres, and wonders are bribable (as are all ships, traders, and heroes).

Experience: loot experience is 10% of maximum health for centres, crannogs, and fortications (fortresses, outposts, sentry towers, stone towers, wall turrets), 0 for other structures.

Loot: loot resources are standardized to 10% of resource costs (all structures).

Territory: army camps, centres, crannogs, docks, harbours, 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).

Unavailable: colonies, council chambers, embassies, Ishtar gate, and royal stoas are disabled.

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
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)	–	–	–	–	–	–	–	–
dog kennels	–	V (T)	–	–	–	–	–	–	–	–	–	–
combined barracks	– (V)	V	– (V)	V	V	– (V)	V	–	– (V)	V	– (V)	– (V)
infantry barracks	V (–)	–	T (–)	–	–	V (–)	–	V	V (–)	–	V (–)	V (–)
camel stables	–	–	–	–	–	–	–	–	V (–)	–	–	–
cavalry stables	V (–)	–	–	–	–	V (–)	–	V	T (–)	–	V (–)	V (–)
chariot stables	–	–	–	–	–	–	–	–	–	–	–	–
elephant stables	–	–	C (–)	–	–	–	V (T)	C (–)	C (–)	–	C (–)	–
military hall	C	–	C (–)	T	–	C (–)	C (–)	C	C (–)	–	C (–)	C
siege workshop	T (–)	T (–)	T (–)	T (–)	T (–)	T (C)	T (–)	T (–)	T (–)	T (–)	T (–)	T (–)
shipyard	T (–)	–	T (–)	–	–	T (–)	–	T (–)	T (–)	T (–)	T (–)	T (–)
village palisade	V	V	V	V	V	V	V	V	V	V (–)	V	V
town turf walls	T (–)	T (–)	T (–)	T (–)	T (–)	T (–)	T (–)	T (–)	T (–)	T (C)	T (–)	T (–)
city stone walls	C (T)	C (T)	C (T)	C (T)	C (T)	C (T)	C (T)	C (T)	C (T)	C (T)	C (T)	C (–)
outpost	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)
stone 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)
fortress	C	C	C	C	C	C	C	C	C	C	C	C
army camp	–	–	–	–	–	–	–	–	–	C	–	–
crannog	–	T	–	–	–	–	–	–	–	–	–	–
harbour	–	–	C (T)	–	–	–	–	–	–	–	–	–
library	–	–	–	–	–	C	–	–	C	–	C	–
lighthouse	–	–	–	–	–	–	–	–	C (T)	–	–	–
monument/pillar	–	–	–	–	C	–	C*	–	–	–	–	–
palace	–	–	–	–	–	–	C (–)	C	–	–	–	–
theatre	C	–	–	–	–	C	–	–	C (–)	–	C (–)	– (C)
Vestal temple	–	–	–	–	–	–	–	–	–	C (T)	–	–
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 (f, w, m, s; time)	loot (f, w, m, s; exp)	in neutral territory	territory root/ radius/weight	pop. bonus	garrison capacity	health/ capture	armour (h, p, c)	vision range
centre, crannog	V	500, 500, 500, 500; 600 (0, 500, 500, 500; 500)	50, 50, 50, 50; 300 (0, 200, 200, 200; 200)	yes	1/150/10000 (1/140/10000)	25 (20)	25 (20)	3000/3000 (3000/2500)	25, 35, 3 (25, 35, 3)	100 (90)
army camp (rome)	C	100, 600, 100, 0; 240 (0, 500, 200, 0; 250)	10, 60, 10, 0; 240 (0, 100, 0, 0; 100)	yes	– –	8 (5)	40 (40)	2400/1600 (2500/1500)	15, 25, 2 (15, 25, 2)	80 (60)
barracks	V	100, 300, 0, 100; 200 (0, 300, 0, 0; 150)	10, 30, 0, 10; 0 (0, 30, 0, 10; 0)	no	0/40/40000 (0/50/40000)	0 (0)	10 (10)	2000/500 (2000/500)	20, 35, 3 (20, 35, 3)	40 (32)
docks	V	50, 200, 0, 0; 150 (0, 200, 0, 0; 150)	5, 20, 0, 0; 0 (30, 30, 0, 0; 0)	yes	–	5 (5)	0 (0)	2500/500 (2500/500)	20, 35, 3 (20, 35, 3)	50 (40)
naval shipyard (cart)	T	200, 400, 200, 200; 500 (0, 300, 0, 200; 500)	20, 40, 20, 20; 0 (0, 75, 0, 50; 0)	yes	1/200/25000 (1/200/25000)	10 (10)	25 (5)	5000/5000 (5000/2000)	20, 40, 5 (20, 35, 3)	100 (100)
outpost tower	V	0, 75, 0, 0; 50 (0, 80, 0, 0; 40)	0, 8, 0, 0; 0 (0, 8, 0, 0; 100)	yes	–	0 (0)	1 (1)	750/500 (800/500)	5, 20, 1 (5, 20, 1)	100 (80)
sentry tower	T (V)	50, 100, 0, 50; 100 (0, 100, 0, 0; 40)	5, 10, 0, 5; 0 (0, 20, 0, 0; 100)	no	0/20/20000 (0/16/30000)	0 (0)	3 (3)	1000/750 (250/800)	15, 25, 2 (20, 25, 1)	100 (80)
stone tower	C (T)	50, 150, 0, 100; 150 (0, 100, 0, 100; 150)	5, 15, 0, 10; 0 (0, 0, 0, 20; 100)	no	0/30/30000 (0/32/30000)	0 (0)	5 (5)	1500/1000 (1000/500)	25, 30, 3 (25, 30, 3)	20 (20)
fortress	C	200, 400, 100, 800; 450 (0, 0, 0, 1000; 500)	20, 40, 10, 80; 600 (0, 0, 0, 65; 100)	no	0/100/40000 (0/100/40000)	20 (20)	30 (20)	6000/4500 (4200/4000)	25, 40, 6 (25, 40, 6)	100 (80)
wall short	C (T)	0, 20, 0, 60; 30 (0, 0, 0, 15; 15)	0, 2, 0, 6; 0 (0, 0, 0, 15; 100)	yes (no)	0/20/60000 (0/20/65535)	0 (0)	5 (5)	2000/1200 (1000/1200)	25, 30, 3 (25, 30, 3)	20 (20)
wall medium	C (T)	0, 30, 0, 90; 45 (0, 0, 0, 22; 30)	0, 3, 0, 9; 0 (0, 0, 0, 15; 100)	yes (no)	0/20/60000 (0/20/65535)	0 (0)	5 (5)	3000/1200 (2000/1200)	25, 30, 3 (25, 30, 3)	20 (20)
wall long	C (T)	0, 40, 0, 120; 60 (0, 0, 0, 28; 45)	0, 4, 0, 12; 0 (0, 0, 0, 15; 100)	yes (no)	0/20/60000 (0/20/65535)	0 (0)	5 (5)	4000/1200 (3000/1200)	25, 30, 3 (25, 30, 3)	20 (20)
wall gate	C (T)	0, 40, 40, 0; 15 (0, 0, 0, 60; 10)	0, 8, 4, 12; 0 (0, 0, 0, 15; 100)	yes (no)	0/20/60000 (0/20/65535)	0 (0)	5 (5)	4000/1200 (3000/1200)	25, 30, 3 (25, 30, 3)	20 (20)
wall turret	C (T)	0, 50, 0, 150; 75 (0, 0, 0, 90; 80)	0, 5, 0, 15; 0 (0, 0, 0, 15; 100)	yes (no)	0/20/60000 (0/20/65535)	0 (0)	5 (5)	5000/1200 (4000/1200)	25, 30, 3 (25, 30, 3)	60 (60)
library	C	250, 250, 250, 250; 500 (0, 0, 200, 200; 200)	25, 25, 25, 25; 0 (0, 0, 125, 125; 0)	no	0/50/50000 (0/50/40000)	0 (0)	25 (5)	2500/500 (2000/500)	20, 30, 3 (20, 30, 3)	50 (40)
theatre	C	500, 500, 500, 500; 500 (0, 0, 500, 500; 500)	50, 50, 50, 50; 0 (0, 0, 125, 125; 0)	no	0/100/50000 (0/100/40000)	0 (0)	50 (5)	5000/2500 (2000/500)	20, 30, 3 (20, 30, 3)	100 (40)
wonder	C	1000, 1000, 1000, 1000; 1000 (1000, 1000, 1000, 1000; 1000)	100, 100, 100, 100; 0 (300, 300, 300, 300; 300)	no	1/100/60000 (1/100/65535)	0 (0)	50 (30)	5000/2500 (5000/2000)	15, 25, 3 (15, 25, 3)	100 (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`	0, 800, 400, 0; 40	village	cavalry +1 crush, hack, and pierce armour
(`armor_cavalry_01.json`)	(0, 1000, 350, 0; 40)	(town)	(no crush, +1 hack, +1 pierce)
`armour_cavalry_02.json`	0, 1000, 500, 0; 50	town	cavalry +1 crush, hack, and pierce armour
(`armor_cavalry_02.json`)	(0, 1000, 450, 0; 40)	(city)	(no crush, +1 hack, +1 pierce)
`armour_cavalry_03.json`	0, 1200, 600, 0; 60	city	cavalry +1 crush, hack, and pierce armour
[new]	[new]	[new]	[new]
`armour_females.json`	100, 100, 0, 0; 30	village	females +1 crush, hack, and pierce armour
(`health_females_01.json`)	(150, 0, 0, 0; 40)		(females +50% health)
`armour_hero.json`	0, 250, 500, 0; 60	city	heroes +3 crush, hack, and pierce armour
(`armor_hero_01.json`)	(0, 0, 600, 0; 40)		(no crush, +2 hack, +2 pierce; +50 metal cos
`armour_infantry_01.json`	0, 800, 400, 0; 40	village	infantry +1 crush, hack, and pierce armour
(`armor_infantry_01.json`)	(0, 1000, 350, 0; 40)	(town)	(no crush, +1 hack, +1 pierce)
`armour_infantry_02.json`	0, 1000, 500, 0; 50	town	infantry +1 crush, hack, and pierce armour
(`armor_infantry_02.json`)	(0, 1000, 450, 0; 40)	(city)	(no crush, +1 hack, +1 pierces)
`armour_infantry_03.json`	0, 1200, 600, 0; 60	city	infantry +1 crush, hack, and pierce armour
[new]	[new]	[new]	[new]
`armour_ship_01.json`	0, 200, 0, 0; 40	village	ships +2 crush, hack, and pierce armour
(`armor_ship_reinforcedhull.json`)	(0, 250, 0, 0; 40)		
`armour_ship_02.json`	0, 200, 200, 0; 40	town	ships +2 crush, hack, and pierce armour
(`armor_ship_hypozomata.json`)	(0, 150, 150, 0; 40)		
`armour_ship_03.json`	0, 0, 400, 0; 60	city	ships +2 crush, hack, and pierce armour
(`armor_ship_hullsheating.json`)	(0, 0, 350, 0; 40)		
`attack_cavalry_melee_01`	400, 400, 400, 0; 40	village	melee cavalry +15% attack
	(500, 750, 350, 0; 40)	(town)	(+20%)
`attack_cavalry_melee_02`	500, 500, 500, 0; 50	town	melee cavalry +15% attack
	(500, 500, 500, 0; 40)	(city)	(+20%)
`attack_cavalry_melee_03`	600, 600, 600, 0; 40	city	melee cavalry +15% attack
[new]	[new]	[new]	[new]
`attack_cavalry_ranged_01`	400, 400, 400, 0; 40	village	ranged cavalry +15% attack
	(500, 750, 350; 40)	(town)	(+20%)
`attack_cavalry_ranged_02`	500, 500, 500, 0; 50	town	ranged cavalry +15% attack
	(500, 500, 500; 40)	(city)	(+20%)
`attack_cavalry_ranged_03`	600, 600, 600, 0; 60	city	ranged cavalry +15% attack
[new]	[new]	[new]	[new]
`attack_champions_elite.json`	0, 0, 300, 0; 40	city	melee champions +2 hack melee attack,
	(0, 0, 300, 0; 40)		ranged champions +2 pierce ranged attack
`attack_infantry_melee_01`	400, 400, 400, 0; 40	village	melee infantry +15% attack
	(500, 500, 250, 250; 40)	(town)	(+20%)
`attack_infantry_melee_02`	500, 500, 500, 0; 50	town	melee infantry +15% attack
	(500, 500, 250, 450; 40)	(city)	(+20%)
`attack_infantry_melee_03`	600, 600, 600, 0; 60	city	melee infantry +15% attack
[new]	[new]	[new]	[new]
`attack_infantry_ranged_01`	400, 400, 400, 0; 40	village	ranged infantry +15% attack
	(500, 500, 250, 250; 40)	(town)	(+20%)
`attack_infantry_ranged_02`	500, 500, 500, 0; 50	town	ranged infantry +15% attack
	(500, 500, 250, 350; 40)	(city)	(+20%)
`attack_infantry_ranged_03`	600, 600, 600, 0; 60	city	ranged infantry +15% attack
[new]	[new]	[new]	[new]
`attack_soldiers_will.json`	1500, 1500, 1500, 1500; 60	city	units −20% reload time
	(1500, 1500, 1500, 1500; 40)		(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 (50, 0, 0, 0; 40)	village	domestic animals −25% breed time
gather_capacity_01.json (gather_capacity_basket.json)	250, 250, 0, 0; 30 (300, 300, 0, 0; 40)	village	workers +5 resource carrying capacity
gather_capacity_02.json (gather_capacity_wheelbarrow.json)	500, 500, 0, 0; 45 (500, 500, 0, 0; 40)	town	workers +5 resource carrying capacity
gather_capacity_03.json (gather_capacity_carts.json)	1000, 1000, 0, 0; 60 (1000, 1000, 0, 0; 40)	city	workers +5 resource carrying capacity (+10)
gather_capacity_fishing.json	200, 100, 0, 0; 30 (200, 100, 0, 0; 30)	town	fishing boats +20 food carrying capacity
gather_farm_01.json (gather_farming_plows.json)	0, 200, 100, 0; 40 (0, 200, 100, 0; 40)	village	workers +15% food.grain farming rate
gather_farm_02.json (gather_farming_training.json)	0, 400, 200, 0; 50 (0, 300, 150, 0; 40)	town	workers +20% food.grain farming rate (+15%)
gather_farm_03.json (gather_farming_fertilizer.json)	0, 600, 300, 0; 60 (0, 500, 250, 0; 40)	city	workers +25% food.grain farming rate
gather_fish_capacity.json (gather_capacity_fishing.json)	200, 100, 0; 30 (200, 100, 0; 30)	town	fishing boats +20 food carrying capacity
gather_fish_net.json (gather_fishing_net.json)	0, 100, 0, 0; 30 (0, 100, 0, 0; 30)	village	fishing boats +25% food.fish fishing rate (+30%)
gather_lumber_01.json (gather_lumbering_ironaxes.json)	125, 125, 50, 0; 30 (0, 200, 50, 0; 40)	village	workers +20% wood.tree lumbering rate (+15%)
gather_lumber_02.json (gather_lumbering_strongeraxes.json)	250, 250, 100, 0; 45 (0, 250, 50, 0; 40)	town	workers +25% wood.tree lumbering rate (+15%)
gather_lumber_03.json (gather_lumbering_sharpaxes.json)	500, 500, 200, 0; 60 (0, 1000, 150, 150; 40)	city	workers +30% wood.tree lumbering rate (+50%)
gather_mine_01.json (gather_mining_wedgemallet.json)	125, 125, 50, 0; 30 (0, 200, 50, 0; 40)	village	workers +20% metal.ore mining rate (+15%)
gather_mine_02.json (gather_mining_shaftmining.json)	250, 250, 100, 0; 45 (0, 250, 50, 0; 40)	town	workers +25% metal.ore mining rate (+15%)
gather_mine_03.json (gather_mining_silvermining.json)	500, 500, 200, 0; 60 (0, 1000, 150, 150; 40)	city	workers +30% metal.ore mining rate (+50%)
gather_quarry_01.json (gather_mining_servants.json)	125, 125, 50, 0; 30 (0, 200, 50, 0; 40)	village	workers +20% stone.rock quarrying rate (+15%)
gather_quarry_02.json (gather_mining_serfs.json)	250, 250, 100, 0; 45 (0, 250, 50, 0; 40)	town	workers +25% stone.rock quarrying rate (+15%)
gather_quarry_03.json (gather_mining_slaves.json)	500, 500, 200, 0; 60 (0, 1000, 150, 150; 40)	city	workers +30% stone.rock quarrying rate (+50%)
gather_forage.json (gather_wicker_baskets.json)	0, 100, 0, 0; 30 (0, 100, 0, 0; 40)	village	workers +50% food.fruit foraging rate, +5 food carrying capacity (+50%; 0)
trade_commercial_treaty.json	0, 0, 200, 0; 40 (0, 0, 100, 0; 40)	town	markets +0.1 [i.e. +10%] international bonus
trade_convoy_armour.json (trade_convoys_armor.json)	0, 200, 200, 0; 40 (0, 0, 200, 0; 40)	city	traders +2 crush, hack, and pierce armour (no crush)
trade_convoy_speed.json (trade_convoys_speed.json)	200, 0, 200, 0; 40 (0, 0, 200, 0; 40)	town	traders +10% walk speed (+25%)
trade_gain_01.json	200, 200, 200, 0; 40 (0, 150, 150, 0; 40)	town	traders +10% gain
trade_gain_02.json	300, 300, 300, 0; 40 (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 (500, 0, 250, 0; 40)	town	barracks +1 buff heal garrison
`heal_camel_stables.json` *[new]*	500, 0, 250, 0; 40 *[new]*	town *[new]*	camel stables +1 buff heal garrison *[new]*
`heal_cavalry_stables.json` *[new]*	500, 0, 250, 0; 40 *[new]*	town *[new]*	cavalry stables +1 buff heal garrison *[new]*
`heal_chariot_stables.json` *[new]*	500, 0, 250, 0; 40 *[new]*	town *[new]*	chariot stables +1 buff heal garrison *[new]*
`heal_dog_kennels.json` *[new]*	500, 0, 250, 0; 40 *[new]*	town *[new]*	dog kennels +1 buff heal garrison *[new]*
`heal_elephant_stables.json` *[new]*	500, 0, 250, 0; 40 *[new]*	town *[new]*	elephant stables +1 buff heal garrison *[new]*
`heal_hall.json` *[new]*	500, 0, 250, 0; 40 *[new]*	town *[new]*	military halls +1 buff heal garrison *[new]*
`heal_range_01.json` (`heal_range.json`)	200, 0, 100, 0; 30 (400, 0, 200, 0; 40)	town	healers +3 heal range (+5 heal and vision range)
`heal_range_02.json` (`heal_range_2.json`)	400, 0, 200, 0; 30 (800, 0, 400, 0; 40)	city	healers +3 heal range (+5 heal and vision range)
`heal_rate_01.json` (`heal_rate.json`)	500, 0, 250, 0; 40 (500, 0, 250, 0; 40)	town	healers −20% heal time
`heal_rate_02.json` (`heal_rate_2.json`)	1000, 0, 500, 0; 40 (1000, 0, 500, 0; 40)	city	healers −20% heal time
`heal_temple.json`	500, 0, 250, 0; 40 (500, 0, 250, 0; 40)	city	temples +50% buff heal garrison
`health_regen_units.json`	1000, 0, 500, 0; 60 (1000, 0, 250, 0; 40)	city	idle units +0.5 health regeneration rate

4.4 Comparison table (miscellaneous)

technology	cost (f, w, m, s; time)	phase	effects
`phase_city.json`	500, 500, 500, 500; 90 (0, 0, 750, 750; 60) 3 (4) town structures	town	civic centres −0.5 health regeneration (−) and +30% territory radius (+50%) (citizen soldiers +10% health)
`phase_town.json`	500, 500, 0, 0; 60 (500, 500, 0, 0; 30) 5 village structures	village	civic centres −0.5 health regeneration (−) and +30% territory radius (+30%) (citizen soldiers +20% health)
`phase_village.json`	*[autoresearched]*	−	
`spy_counter.json`	600, 0, 600, 0; 75 (400, 0, 400, 0; 60)	city	+100% bribe costs (+50%)
`unlock_champion_units.json`	400, 400, 400, 0; 90 (0, 0, 1000, 0; 90)	city	
`unlock_females_house.json`	250, 100, 100, 0; 60 (250, 100, 100, 0; 60)	village	
`unlock_shared_dropsites.json`	100, 200, 200, 100; 40 (200, 200, 100, 100; 40)	village	
`unlock_shared_los.json`	100, 0, 100, 0; 40 (100, 0, 100, 0; 40)	village	
`unlock_spies.json`	400, 0, 400, 0; 75 (500, 500, 300, 300; 80)	town (city)	
`upgrade_rank_advanced_mercenary.json`	200, 0, 300, 0; 40 (200, 200, 0, 0; 40)	town	mercenaries +10% health, −10% gather rate (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.

4.5 Comparison table (siege)

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

4.6 Comparison table (structures)

technology	cost (f, w, m, s; time)	phase	effects
centre_watch_01.json *[new]*	200, 0, 100, 0; 30 *[new]*	village *[new]*	centres +1 default arrow *[new]*
centre_watch_02.json *[new]*	400, 0, 200, 0; 30 *[new]*	town *[new]*	centres +1 default arrow *[new]*
centre_watch_03.json *[new]*	600, 0, 300, 0; 30 *[new]*	city *[new]*	centres +1 default arrow *[new]*
pop_house_01.json	0, 100, 0, 100; 40 (0, 300, 0, 100; 40)	village (town)	houses +20% population
pop_house_02.json	0, 200, 0, 200; 50 (0, 300, 0, 300; 40)	town (city)	houses +20% population
pop_house_03.json *[new]*	0, 300, 0, 300; 60 *[new]*	city *[new]*	houses +20% population *[new]*
pop_wonder.json	2000, 2000, 2000, 2000; 120 (2000, 3000, 500, 500; 120)	wonder	+10% maximum population each wonder (+40 (flat))
tower_armour.json (attack_tower_defense.json)	0, 500, 500, 500; 60 (0, 500, 500, 500; 40)	city	stone towers +2% crush, hack, and pierce armour
tower_crenellations.json (attack_tower_crenellations.json)	0, 250, 250, 500; 60 (0, 0, 250, 500; 40)	town	towers and fortresses +40% arrows per garrisoned soldier
tower_decay.json (decay_outpost.json)	0, 0, 0, 100; 30 (0, 0, 0, 100; 40)	village	outposts −50% decay rate
tower_murderholes.json (attack_tower_murderholes.json)	0, 250, 0, 250; 60 (0, 500, 0, 100; 40)	city	towers and fortresses 0 minimum attack range
tower_range.json (attack_tower_range.json)	0, 500, 250, 0; 60 (0, 500, 250, 0; 40)	town	towers and fortresses +8 m maximum attack range (and visio
tower_vision.json (vision_outpost.json)	100, 0, 0, 0; 30 (100, 0, 0, 0; 40)	village	all towers +20% vision range (outposts +50%)
tower_watch.json (attack_tower_watch.json)	500, 0, 250, 0; 60 (500, 0, 0, 0; 40)	village	sentry and stone towers +1 default arrow
walls_geometric.json (health_walls_geometric_masonry.json)	0, 0, 0, 250; 45 (0, 0, 0, 200; 40)	town	city walls +2 crush armour and +20% build time (+2; +10%)
walls_rubble.json (buildtime_walls_rubble.json)	0, 250, 0, 0; 45 (0, 200, 0, 0; 40)	town	city walls −20% build time and −1 crush armour

4.7 Comparison table (training)

technology	cost (f, w, m, s; time)	phase	effects
`drill_camelry_01.json` *[new]*	150, 0, 100, 0; 30 *[new]*	village *[new]*	camelry starts at rank 1/12 *[new]*
`drill_camelry_02.json` *[new]*	300, 0, 200, 0; 45 *[new]*	town *[new]*	camelry starts at rank 2/12 *[new]*
`drill_camelry_03.json` *[new]*	450, 0, 300, 0; 60 *[new]*	city *[new]*	camelry starts at rank 3/12 *[new]*
`drill_cavalry_01.json` *[new]*	300, 0, 200, 0; 30 *[new]*	village *[new]*	cavalry starts at rank 1/12 *[new]*
`drill_cavalry_02.json` *[new]*	600, 0, 400, 0; 45 *[new]*	town *[new]*	cavalry starts at rank 2/12 *[new]*
`drill_cavalry_03.json` *[new]*	900, 0, 600, 0; 60 *[new]*	city *[new]*	cavalry starts at rank 3/12 *[new]*
`drill_chariotry_01.json` *[new]*	250, 0, 150, 0; 30 *[new]*	village *[new]*	chariots start at rank 1/12 *[new]*
`drill_chariotry_02.json` *[new]*	500, 0, 300, 0; 45 *[new]*	town *[new]*	chariots start at rank 2/12 *[new]*
`drill_chariotry_03.json` *[new]*	750, 0, 450, 0; 60 *[new]*	city *[new]*	chariots start at rank 3/12 *[new]*
`drill_dogs_01.json` *[new]*	200, 0, 0, 0; 30 *[new]*	village *[new]*	war dogs start at rank 1/12 *[new]*
`drill_dogs_02.json` *[new]*	400, 0, 0, 0; 45 *[new]*	town *[new]*	war dogs start at rank 2/12 *[new]*
`drill_dogs_03.json` *[new]*	600, 0, 0, 0; 60 *[new]*	city *[new]*	war dogs start at rank 3/12 *[new]*
`drill_elephantry_01.json` *[new]*	400, 0, 200, 0; 30 *[new]*	village *[new]*	war elephants start at rank 1/12 *[new]*
`drill_elephantry_02.json` *[new]*	800, 0, 400, 0; 45 *[new]*	town *[new]*	war elephants start at rank 2/12 *[new]*
`drill_elephantry_03.json` *[new]*	1200, 0, 600, 0; 60 *[new]*	city *[new]*	war elephants start at rank 3/12 *[new]*
`drill_infantry_01.json` *[new]*	200, 0, 200, 0; 30 *[new]*	village *[new]*	infantry starts at rank 1/12 *[new]*
`drill_infantry_02.json` *[new]*	400, 0, 400, 0; 45 *[new]*	town *[new]*	infantry starts at rank 2/12 *[new]*
`drill_infantry_03.json` *[new]*	600, 0, 600, 0; 60 *[new]*	city *[new]*	infantry starts at rank 3/12 *[new]*
`speed_horse_01` (`speed_cavalry_01`)	300, 0, 100, 0; 40 (500, 500, 150, 0; 40)	village (town)	cavalry and chariots +5% walk speed (cavalry +10%)
`speed_horse_02` (`speed_cavalry_02`)	450, 0, 150, 0; 50 (500, 500, 150, 0; 40)	town (city)	cavalry and chariots +5% walk speed (cavalry +10%)
`speed_horse_03` *[new]*	600, 0, 200, 0; 60 *[new]*	city *[new]*	cavalry and chariots +5% walk speed *[new]*
`training_barracks.json` (`training_conscription.json`)	500, 0, 0, 0; 40 (500, 0, 0, 0; 40)	city	barracks −0.1 batch time modifier
`training_camel_stables.json` *[new]*	500, 0, 0, 0; 40 *[new]*	city *[new]*	camel stables −0.1 batch time modifier *[new]*
`training_cavalry_stables.json` *[new]*	500, 0, 0, 0; 40 *[new]*	city *[new]*	cavalry stables −0.1 batch time modifier *[new]*
`training_chariot_stables.json` *[new]*	500, 0, 0, 0; 40 *[new]*	city *[new]*	chariot stables −0.1 batch time modifier *[new]*
`training_dog_kennels.json` *[new]*	500, 0, 0, 0; 40 *[new]*	city *[new]*	dog kennels −0.1 batch time modifier *[new]*
`training_elephant_stables.json` *[new]*	500, 0, 0, 0; 40 *[new]*	city *[new]*	elephant stables −0.1 batch time modifier *[new]*
`training_hall.json` *[new]*	500, 0, 0, 0; 40 *[new]*	city *[new]*	military halls −0.1 batch time modifier *[new]*
`training_docks.json` (`training_naval_architects.json`)	200, 200, 0, 0; 40 (200, 200, 0, 0; 40)	city	docks −0.1 batch time modifier

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, outposts, fortresses, and centres 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]*

- Tribal (Briton, Gaulish, and Iberian centres have −20% resource cost, build time, population bonus, garrison capacity, capture points, health, loot, experience, and territory influence radius. *[new]*

- 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 have −50% resource costs and construction time and Market technologies have a 25% 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]*

- 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 +10% territory influence radius. *[new]*

- Ptolemaic healers have +6 healing range. *[new]*

- Ptolemies have a 30% resource cost and time discount on Temple technologies. *[new]*

- Romans have a 10% resource cost and time discount on Barracks technologies. *[new]*

- Roman cavalry swordsmen have a −10% melee attack damage penalty. *[new]*

- Roman infantry swordsmen have +10% melee attack damage. *[new]*

- Seleucid centres have −30% 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); centres have one more default arrow and +50% health and capture points (instead of +100%).

- 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 −4% 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 −4% 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 −4% 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: centres −20% construction time *[new]*
    formerly: 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]: +15% territory influence *[unchanged]*

- Wonder [each]: +10.0 maximum population limit *[unchanged]*; additional +10% with "glorious expansion" researched (instead of +40.0) *[changed]*, and structures +10% territory influence radius