Correspondence between techs:

new	BtS		new	BtS
Bookkeeping	Calendar		Guns	Gunpowder
Coinage	Currency		Political Economy	Economics
Statecraft	Civil Service		Nation State	Nationalism
Republic	Drama		Blast Furnace	Chemistry
Alchemy	Philosophy		Military Studies	Military Science
Crop Rotation	Metal Casting		Ballistics	Artillery
Divine Law	Divine Right		Rapid Fire	n/a
Patronage	Music		Equality	Democracy+Communism
Astronavigation	Astronomy		Totalitarianism	Fascism+Communism
			(no replacement)	Priesthood

Tech tree (boxes)

Row: Hunting — Archery — Horseback Riding

Agriculture — Animal Husbandry — Aesthetics — Literature — Theology — Divine Law — Patronage — Physics — Electricity — Refrigeration — Supercond. — Fusion

The Wheel — Writing — Bookkeeping — Mathematics — Construction — Machinery — Engineering — Scientific M. — Steam Pow. — Railroad — Fission

Pottery — Alphabet — Coinage — Paper — Printing Press — Constitution — Equality — Combustion — Radio — Computers — Genetics

Fishing — Sailing — Alchemy — Compass — Astronavigation — Optics — Biology — Ecology — Mass Media — Robotics

Mysticism — Meditation — Monotheism — Statecraft — Guns — Mil. Studies — Medicine — Flight — Adv. Flight — Future Tech

Polytheism — Monarchy — Republic — Education — Blast Furnace — Steel — Rapid Fire — Ballistics — Rocketry — Satellites — Stealth

Masonry — Code of Laws — Guilds — Pol. Economy — Liberalism — Repl. Parts — Rifling — Industrialism — Plastics — Laser — Fiber Optics

Mining — Bronze Working — Iron Working — Crop Rotation — Feudalism — Banking — Milit. Tradition — Nation State — Corporation — Assembly Line — Totalitarianism — Composites

Footnotes / tech descriptions

- Hunting (60): Scout, Camp, Spear (with Copper)

- Agriculture (60): Farm, Plantation (on Silk, Dye, Incense)[1]

- Wheel (60): Road, Chariot (with Horse)

- Fishing (60): can work Coast, Workboat, faster movement along rivers[2]

- Mysticism (60): Monument, Stonehenge, reveal Incense[1]

- Mining (60): Mine, can clear Forest and Jungle for no yield[3]

- Archery (60): Archer, Great Wall (req. 2 Walls)[4]

- Animal Husbandry (100): Pasture, reveal Horse and Silk,[1] Stable (with Horse or Ivory)[5]

- Pottery (90): Granary (with Agriculture)[6], Cottage, Workshop on Plains[7]

- Sailing (100): Galley[8], Lighthouse, Moai Statues, trade along unowned Coast

- Meditation (80):[9] Monastery, founds Buddhism (unless the discoverer owns a Holy City without a Shrine)[10]

- Masonry (60): Quarry, Walls, Great Lighthouse (with Lighthouse), Pyramids[11]

- Writing (150): Library, Open Borders

- Polytheism (80): Temple,[9] Oracle[11], Temple of Artemis, found Hinduism (unless... see Buddhism)

- Bronze Working (120): Axeman (with Copper or Iron), reveal Copper, 20 yield from chopping Forest, Forced Labor[12]

- Horseback Riding (220): Horse Archer (with Archery, Horse)

- Bookkeeping (160):[13] Market, Gold trading,[14] Temple of Kukulcan (with Polytheism)[15]

- Machinery (800):[50] Watermill, Lumbermill, +50% chopping yield,[51] Crossbow (with Iron or Copper)[52]

- Alphabet (200): Spy, Commando promotion, build Research, increases tech diffusion[16]

- Monotheism (150):[17] Organized Religion, Winery,[18] found Judaism (unless... see Buddhism)

- Monarchy (200): Hereditary Rule, Barracks, Fort[19]

- Iron Working (190): Swordsman (with Iron), Forge[20], reveal Iron

- Aesthetics (280): Mausoleum of Mausolos[21], Statue of Zeus (req. 2 Monuments), Angkor Wat[22]

- Mathematics (240):[23] Aqueduct (with Mining)[24], Hanging Gardens (with Aqueduct), centers the map[25], Trireme (with Sailing, Bronze Working)[26]

- Coinage (320):[27] +1 rade route, build Wealth, Shwedagon Paya[28] (with Meditation)

- Code of Laws (270):[29] Courthouse, Caste System, Vassal agreement[30], Missionaries can spread to foreign cities[31]

- Literature (350): Heroic Epic (with Polytheism, Library),[32] Great Library (with Library), Theater, Culture slider[33]

- Construction (200): Aqueduct (with Mining)[24], Hanging Gardens... — Theocracy,[59] Spiral Minaret, found Islam (unless... see Buddhism)

- Construction (200): Heroic Epic... Colossus[38] (with Forge), Bridge building

- Statecraft (400):[39] War Elephant[40] (with Horseback Riding, Ivory), Forbidden Palace[41] (req. 6 Courthouses), Guerilla promotion[42], found Confucianism[43] (unless... see Buddhism)

- Theology (800):[49] Apostolic Palace, Hagia Sophia, found Christianity (unless... see Buddhism)

- Astronavigation (1900):[80] Caravel (with Construction)[81], Navigation II promotion[82], +1 sight on water[83]

- Guns (2400):[84] Musketman, Pinch promotion

- Political Economy (2100):[85] Mercantilism, +1 production from Lumbermill,[86] Customs House[87] (with Harbor), Versailles[88]

- Crop Rotation (800):[55] Serfdom[56], Farm on all Grassland tiles, Cities and fresh-water Farms spread Irrigation[57]

- Military Tradition (2400):[89] Cuirassier (with Guns, Horseback Riding, Horse), Kremlin[90], Militarism[91], Defensive Pact

- Divine Law (1000):[58] Theocracy,[59] Spiral Minaret, found Islam (unless... see Buddhism)

- Scientific Method (2500):[92] Tech trading[93], +1 research per specialist[94], obs. Statue of Zeus, Angkor Wat[95] and Monastery

- Paper (1200):[60] University of Sankhore, Bureaucracy (with Statecraft)[61]

- Constitution (2700):[96] Jail, Federation (with Nation State)[97], Representation, obs. Monument, Stonehenge[98] and Mausoleum of Mausolos[99]

- Guilds (1300):[62] Pikeman (with Iron), Maceman (with Machinery, Iron),[63] Plantation (on Banana, Spice, Sugar)[64], Workshop on all flat tiles[65]

- Optics (2500):[100] Galleon, Privateer (with Guns and Copper or Iron)[101], trade across Ocean, Lookout promotion for naval units[102], obs. Great Lighthouse[103]

- Feudalism (800): Longbow (with Archery, Iron Working)[66], Knight[67] (with Machinery, Horseback Riding, Iron, Horse), Castle[68], Vassalage civic

- Blast Furnace (2700):[104] Cannon (with Iron)[105], Frigate (with Optics and Iron), Grenadier[106], Barrage promotion[107], obs. Colossus[108] and Walls (except defensive effects)[109]

- Patronage (1400):[69] Sistine Chapel, build Culture, Cathedral, Stupa etc.

- Liberalism (2500): Free Market (with Nation State),[110] Free Religion, Statue of Liberty (with Harbor and must be in Emancipation and Free Religion)[111], obs. Castle[112], Oracle[113] and Temple of Artemis[114]

- Engineering (1500): Trebuchet, Windmill[70], Notre Dame (with Theology), Taj Mahal (with Divine Law)[71]

- Nation State (2600):[115] Hermitage, Globe Theater (with Theater)[116], free Great Artist if first to discover[117]

- Compass (1400):[72] Map trading[73], Explorer, Grocer (with Guilds)[74], Whaling Boats[75]

- Education (1500):[76] University, Oxford University (with University)

- Physics (2700):[118] Observatory[119], free Great Scientist if first to discover

- Banking (1500):[77] Bank, Great Merchant if first to discover[78]

- Printing Press (2000): +1 commerce from Village and Town, obs. Great Library[79]

- Steam Power (3400):[120] Levee[121], Workers build improvements faster[122], Ironclad[123] (with Iron and Coal), reveal Coal, Farms spread Irrigation[124]

- Equality (3100):[125] Emancipation, Police Headquarters, Security Bureau,[126] obs. Deer[127]

- Military Studies (2900):[128] Ship of the Line (with Optics, Blast Furnace and Iron), Military Academy (with Barracks)[129], +1 movement on Roads[130], Blitz and Ambush promotions

- Replaceable Parts (3300):[131] Drydock[132], +1 production from Windmill, Watermill and Workshop[133]

- Railroad (3700):[134] Rail Track (with Coal or Oil), Public Transportation (with Oil)[135], can trade Crab[136], Mining Inc. Executive (with Corporation, University)

- Combustion (4100):[137] reveal Oil[138], Oil Well, Airship (with Physics)[139], Std. Ethanol Executive (with Corporation, University)[140], obs. Whale, Dye[141]

- Biology (4700):[142] +1 food from Farm, can build Farms without irrigation, Cereal Mills Executive (with Corporation, University)[143]

- Steel (4200):[144] Bunker[145], Steelworks (with Iron, Coal, Forge)[146], Cristo Redentor (with Theology)[147], faster production of Ancient and Classical buildings[148], Creative Constructions Executive[149] (with Corporation, University)

- Rifling (4000):[150] Rifleman, Cavalry (with Military Tradition, Horseback Riding, Horse)

- Corporation (4200):[151] Wall Street (with Bank), +1 trade route, State Property (with Equality)[152], can train Executives at Universities[153]

- Electricity (5000):[154] reveal Aluminium[155], Broadway (with Theater), +1 commerce from Watermill[156], Coal Plant (with Coal)[157], Hydroplant (with Steel), Three Gorges Dam (with Steel)[158]

- Ecology (5100): Environmentalism[159], Treatment Plant[160], Preserve Forest, National Park,[161] obs. Ivory[162]

- Medicine (4200): Hospital (with power), Red Cross (with Hospital), Fallout Shelter (with Steel, Manhattan Poject)[163], Medic III promotion[164]

- Rapid Fire (4800): Machine Gun,[165] Field Gun[166], Infantry (with Assembly Line)[167], Interception I promotion[168], Mount Rushmore[169]

- Assembly Line (5200):[170] Factory (with Coal, Oil or power)[171], Universal Suffrage (with Equality)[172]

- Radio (7800):[173] Attack Submarine (Oil or Uranium)[174], Rock'n'roll (with Arena[46], power), Eiffel Tower (with Forge), reveal Uranium[175]; Air Recon can reveal Submarines[176]

- Flight (7000):[177] Fighter (with Oil), Bomber (with Radio and Oil)[178], Carrier (with Coal or Oil or Uranium), Paratrooper[179]

- Ballistics (5500):[180] Battleship (with Coal or Oil or Uranium), Destroyer (with Radio and Coal or Oil),[181] Tank (with Assembly Line, Railroad and Oil)[182]

- Industrialism (7200):[183] Industrial Park (with Factory, power), Marine (with Rapid Fire)[184], Transport (with Optics and Coal or Oil)[185], Pentagon[186], Aluminium Co. Executive (with University)[187]

- Totalitarianism (5500):[188] Police State, Permanent Alliance, Intelligence Agency, free Great Spy if first to discover,[189] obs. Parthenon[190]

- Refrigeration (8000): Supermarket (with power), +1 food from Fishing Boats[191], Sid's Sushi Executive (with Corporation, University)[192]

- Computers (8400):[193] 100% conversion rate from Processes[194], SS Life Support (with Ecology)[195]

- Mass Media (9000): United Nations, Hollywood (with Broadcast Tower), Broadcast Tower (with power), Civ. Jewelers Executive (with Corporation, University)[196], obs. Apostolic Palace

- Rocketry (8500):[197] SAM Infantry (with Radio[198], Anti-Tank[199], Guided Missile, Missile Submarine (with Radio and Oil or Uranium)[174], Missile Cruiser (with Radio and Oil or Uranium)[200]

- Plastics (8500):[201] +1 trade route from Harbor[202], +3 happiness in all cities[203], Offshore Platform[204], obs. Fur, Silk[205]

- Fission (9500):[206] Manhattan Project (with Nuclear Plant), Tactical Nuke (with Nuclear Plant), ICBM (with Satellites[207], Uranium and Manhattan Project), Nuclear Plant (with Uranium)

- Advanced Flight (11000):[208] Gunship (with Oil); Jet Fighter (with Aluminium, Oil), Airport (with Radio, Oil)[209], obs. Stable and Horse[210]

- Satellites (9000):[211] Apollo Project (with Plastics)[212], reveal map, SDI (with Manhattan Project)[213]

- Laser (11000):[214] Mobile SAM (with Rocketry, Oil), Howitzer[215] (with Ballistics and Oil), Space Elevator (with Satellites)[216]

- Composites (11000):[217] SS Casing, Mechanized Infantry (with Rapid Fire, Aluminium, Oil)[218], Modern Armor (with Laser, Ballistics, Oil)[219]

- Superconductors (12000): SS Thrusters, Particle Accelerator (with Computers, Fission and power)[220]

- Genetics (12000):[221] SS Stasis Chamber (with Refrigeration)[222], +2 health, +1 food in Grassland tiles with at least 5 food[223]

- Robotics (10000): SS Docking Bay, +1 free Engineer from Industrial Park[224]

- Stealth (12000): Stealth Bomber (with Advanced Flight, Aluminium, Oil),[225] Stealth Destroyer (with Oil or Uranium), Air Recon can reveal stealthy ships[226]

- Fiber Optics (12000):[227] SS Cockpit, Internet[228]

- Future Tech (10000):[229] + 1 health, +1 happiness

- Fusion (12000):[230] SS Engine, free Great Engineer[231] if first to discover

1. Dye seems to refer mostly to indigo, which was cultivated since 2500 BC. Considering that most Dye is blocked by Jungle initially, no additional tech should be required. Silk and frankincense are also pre-classical trade commodities and come from simple tree plantations. For silk production, it's not enough to plant mulberry trees; the silkworms also need to be domesticated. Require Animal Husbandry for this. Without ritual uses, incense might not be valuable enough to plant incense trees, so Mysticism is required. To avoid introducing additional Plantation improvements, all early Plantations require Agriculture, and Mysticism and Animal Husbandry reveal Incense and Silk.

About the other three Plantations, see Guilds. All six at the same tech (as in BtS) gives civs near the quarter too many resources at once and allows too much city growth too early.

The additional happiness in the early game is welcome since Slavery can no longer be used to work unused unhappiness. None of the three resources are very powerful, and civs need to stretch a little to get them (remove Jungle or Forest, settle near Jungle or Desert).

2. Same as in Alpha Centauri. Should make Fishing a bit more useful for civs that start with Fishing but not at a coast.

3. The BtS requirements for clearing Forest and Jungle neglect the real tools were necessary, but slash-and-burn doesn't require sophisticated tools. Some tech should be required for slash-and-burn because all other Worker jobs have tech requirements too. Mining somewhat fits because it may involve fire-setting, another fire-based technique.

One could argue that equatorial rainforest is too dense and wet for slash-and-burn, but there is also no incentive to settle deep in the jungle in the early game, especially since bad health is now caused by latitude not Jungle (i.e. it persists after the Jungle is cleared), and Workers have limited charges.

Similarly, clearing Forest without yield is usually a bad idea. For a chopping yield, Bronze Working is still required, as metal tools are indeed very helpful for making lumber.

4. Masonry is still required for the prerequisite Walls. Moving the Great Wall to Archery makes Masonry look less cluttered and gives players another reason to discover Archery. Barbarian activity increases gradually in AdvCiv, so an additional tech requirement shouldn't hurt much.

Historically, one could argue that a large wall with flanking towers needs to be manned by archers to be fully effective. That said, other ranged weapons could also do the job, so this explanation is a bit contrived.

5. Earlier access to Stable should boost Chariot, but also allows Stables to be constructed while researching Horseback Riding, so Horse Archer should benefit as well.

6. Pottery is reachable without Agriculture, but Granary needs to store grain, no other kind of food will do. The alternative requirement for Pottery has been changed from Fishing to the Wheel, and the Wheel is no longer a mandatory requirement. That is, the potter's wheel helps, but wheel-less civilizations are also allowed to develop Pottery.

7. Granting +2 production right away because +1 production, -1 food is very rarely worth building. The early Workshops should help convert excess food into production when cities reach the happiness cap. Forced Labor, the replacement for Slavery, also performs this conversion, but not nearly as effectively as Slavery.

The terrain restriction should make Plains a bit more useful compared with Grassland. The early Workshops could represent brickyards, and Plains are clay-colored.

8. Should perhaps rename this to "Pentecoster" to make clear how it differs from Trireme (triremes are also galleys, just a special type).

9. Priesthood has been moved into Polytheism and Meditation. Meditation takes over the arrow to Writing and Philosophy of the not (Oracle, Temple, arrows to Monarchy and Code of Laws). Mainly because Polytheism and Meditation aren't attractive enough in BtS, especially when Buddhism and Hinduism have already been founded. Other advantages: Makes it easier to put Writing in the third column (where it belongs), and makes the second column less crowded (it's the only one with 7 techs in BtS). Plus, Temple no longer comes later than Temple of Artemis, and by requiring Polytheism for Aesthetics, most of the later great temples also require the Temple tech Polytheism (the remaining great temples get explicit requirements; see Divine Law).

Meditation leading to Writing makes some sense if one considers that Meditation also enables Monastery. Polytheism might work better, but Meditation needs this advantage more.

10. This restriction allows civs to found multiple religions, but not in quick succession. More important, though, is an AI change that prevents AI civs from founding religions during the first 30 or so turns. AI leaders with a Medieval-era favorite religion should be especially reluctant early on. There's not much benefit in a religion until a second city is founded or the capital reaches the happiness cap.

11. Note that the abilities of the following wonders have (essentially) been swapped in a circle: Pyramids → Parthenon → Statue of Zeus → Oracle → Pyramids

12. A.k.a. nerfed Slavery. Bronze Working isn't a plausible tech requirement for either civic, but I don't see a clearly better alternative, and the Ancient era should, when in doubt, remain as in BtS, so that the mod starts out in a familiar fashion.

13. A new tech replacing/ encompassing Calendar. The problem with Calendar is that Plantations and the Mausoleum don't have anything to do with calendars, and, apart from other techs, I don't see anything else in the game that would require calendars. "Bookkeeping" is a very broad concept that could include commercial records, star catalogs and basic math, e.g. multiplication tables (leading to Mathematics).

14. Moved from Currency; see Coinage.

15. A.k.a. Chichen Itza. According to Wikipedia, "Kukulkan headed a pantheon [...] used to promote the Itza [...] commercial agenda." So Bookkeeping, as a (mainly) commercial tech, somewhat fits. Since it's a temple, the tech that enables Temple (now Polytheism) should be required.

16. Tech trading with Alphabet would also be acceptable once tech trading is nerfed, but, already, tech exchange prior to Scientific Method (q.v.) should happen through automatic diffusion (and Spies for all I can). Historically, Alphabetic writing may have accelerated tech diffusion, but, of course, wasn't a prerequisite. So something else needs to be enabled by Alphabet, and the Research process somewhat fits (it fits no worse than at Mathematics).

17. Now a Classical-era tech. Judaism originated in the 9th century BC, and the Classical era in BtS should start no later than 1000 BC because that's when the techs in the first Classical column were discovered.

My best bet regarding the Masonry requirement in BtS is that it should prevent one civ from founding all the early religions, not a problem anymore. Similarly, the link from Monotheism to Monarchy (one god, one king?) may have been an attempt to integrate the religious techs with the others, but it's too contrived, and not necessary either. The Ancient religions techs just need to provide some benefit to civs wanting to found the Medieval-era religions. Monotheism doesn't.

18. Viticulture is far older, but that's covered by the 1 commerce granted by the base Wine resource. Wine also expanded into in Judaism, and the Phoenician wine trade picked up around 1000 BC.

19. At the start of the game, Barracks are a waste of UI space and a trap for inexperienced players. Barracks pretty much imply a professional army, and these didn't really exist prior to the Neo-Assyrian Empire. The same goes for Forts as permanently garrisoned outposts.

The Monarchy tech can't just represent (hereditary) kingship because that form of government is far older. It has to be something like the "Early Empire" civic in Civ 6, and that's just the right place for Barracks and Fort. These two also replace Money, which moves to Monotheism.

20. Moved from Metal Casting (see Coinage). A forge is normally operated by a blacksmith who works wrought iron (not cast iron).

21. Previously at Calendar, which doesn't make any sense. The Mausoleum was most famed for the aesthetic value of its sculptures. The Mausoleum replaces the Parthenon, which moves to the new "Republic" tech.

22. Moved from Philosophy, which is now named "Alchemy". The actual construction date is in the 12th century AD; both Aesthetics and Philosophy appear much earlier in the game than that. This can't be helped. The wonder's ability is pretty narrow, so it's possible that no civ will want it before the High Middle Ages. Angkor Wat takes the spot of Shwedagon Paya, for which it's easier to find a new home (Coinage) than for Angkor Wat.

It's important that the wonders splendored by Aesthetics use different resources, so that the discoverer can likely benefit from at least one production discount. These three resources are Marble, Ivory and Gold in BtS, and now Marble, Ivory and Stone, which it still fine.

23. Mathematics has switched places with Calendar, which was then replaced by Bookkeeping. Bookkeeping could represent ancient (e.g. Babylonian) advances in arithmetics and geometry ("Math"), and then Mathematics would be about Greek logics, algebra and trigonometry ("Math II"). The construction of long aqueducts required some math, including, arguably, algebra for the proper gradients.

Moved elsewhere: Research process (Alphabet), increased chopping yield (Machinery), Fort (Monarchy).

24. Aqueducts can also run underground, and bridge aqueducts often also include some tunnels. Hence the Mining requirement.

25. Moved from Calendar. The size of the Earth was approximated through solar observation and trigonometry.

26. Moved from Metal Casting, which came late and has been removed (see Coinage); now assumed to be implied by Bronze Working. Triremes do require metal for the ram.

It's not clear that the construction of triremes required advanced math, but it was apparently an intricate ship design. Wikipedia says that "propulsion, weight and waterline; center of gravity and stability, strength [...] are [variables] dependent of one another."

27. This is Currency rehomed as a metallurgic tech to replace Metal Casting as a bridge to the Medieval era. Metal casting (then wax-casting) is very much a pre-Classical innovation. A civilization that can make bronze also knows how to smelt and cast it.

Not sure to what extent pottery could be necessary for coinage, but Pottery should be required at some point of the Classical era. Previously required for Metal Casting. Coinage requires Mining for the coinage metal (e.g. silver).

Some of the abilities of Currency (Wealth process, Market) have moved to Bookkeeping (the Calendar replacement) to give that tech something to do. The extra trade route and gold trading should still make Coinage an important tech.

28. Moved from Aesthetics. The spot there was needed for Angkor Wat. The real Shwedagon Pagoda was built no earlier than AD 500, but there is no plausible tech requirement to enforce this, and the ability wouldn't work on a Medieval wonder.

29. Requires Currency or Priesthood in BtS, which isn't unreasonable, but the authority of a great king (Monarchy) to enforce his law in a large domain seems more crucial to me. This change also integrates Monarchy better into the tech tree; it only leads to Feudalism in BtS.

30. I needed room at Feudalism, and Code of Laws needed a replacement for Confucianism (now at Statecraft, a. k. a Civil Service) and Chichen Itza (now "Temple of Kukulcan" at Bookkeeping). Client states have existed since the early Mesopotamian empires.

31. That is, prior to Code of Laws, religions can reach foreign cities only through natural spread along the city network. Early religion spread through Missionaries is costly but highly rewarding if it snowballs. By the mid-Classical era, it should be less of a gamble. The Code of Laws restriction should also reduce the headstart that the three early religions have over the other four toward global dominance. One could imagine that Code of Laws allows rulers to negotiate safe passage for their missionaries.

32. That's really National Epic, renamed. The BtS Heroic Epic becomes Triumphal Arch (see Republic).

33. Both adapted from Drama, which gets replaced by Republic (q.v.). Drama is a form of literature.

34. Colosseum moves to Republic under the name "Arena" along with the Masonry requirement.

35. Catapults were typically tension-powered, but developed from primitive (tension-powered) crossbows.

36. Moved from Compass and taking the spot of War Elephant, which moves to Statecraft. The connection between compasses and harbors is a loose one at best. Creating a harbor (or enlarging a natural harbor) through a breakwater or dredging is a construction challenge.

Changes to Harbor (flat route yield bonus, Merchant slot; see stat-changes.pdf) should make it a somewhat useful building by the time Construction is discovered.

37. Sailing needs to be required in some way, and a large (artificial) harbor should be accompanied by a lighthouse.

38. Adopted from Metal Casting, which is no longer a tech (see Coinage), taking the place of Colosseum, which moves to Republic. Some of the plates on the Colossus of Rhodes were of cast metal; this is sufficiently covered by the Forge requirement. A 15 m high statue is a great construction effort.

39. Replacing Civil Service. Maceman (now at Guilds) and irrigation spread (now at Crop Rotation), don't fit well at Civil Service, and it's hard to find Medieval replacements. The name "Statecraft" is supposed to cover the philosophical basis of Chinese civil service, i.e. Confucian governance, particularly meritocracy, as well as Chinese military strategy (from the same period during Spring and Autumn). The civil service system (imperial examinations) itself wasn't introduced until AD 600, so the corresponding civic, Bureaucracy, needs to have a Medieval tech requirement. That's Paper, and Statecraft is required in addition.

40. As a Classical-era tech, Statecraft accompanies Republic, the former representing an "Eastern way", and the latter a "Western way". Both are optional in the sense that they can be avoided until late Renaissance.

Bookkeeping is required because good governance wouldn't be possible without extensive records. Because of its relation to the Chinese imperial examinations, Statecraft is a shortcut to Education (avoiding the more costly Guilds and its prerequisites).

41. The saddle (howdah) may have been a significant mechanical development, but that's not really what Construction is about. War Elephant fits with the military aspect of Statecraft and elephants were most exploited in South East Asia.

42. The Forbidden City was built in AD 1420, but it may well take that long until a civ has enough Courthouses. No tech is required in BtS.

43. This is a new promotion, introduced for the Protective trait. Guerilla warfare was pioneered by Sun Tzu.

44. Previously at Code of Laws. Statecraft made more sense.

45. Replacing Democracy (see Equality) and taking the spot of Drama, which has merged into Literature. Drama is kind of a dead end in BtS because all outgoing arrows are optional (so Music and Philosophy, both contrived). It's also a light tech with just three abilities, one of which comes far too early (Globe Theater, now at Nation State), while other late Classical and early Medieval techs are a bit overloaded (Construction, Feudalism, Engineering) and would become even more crowded after the removal of Metal Casting. Therefore a new tech, one for which it's easy to find abilities.

The Republic tech also integrates Alphabet into the tech tree – the arrow to Currency in BtS is dubious. The idea is that a republic requires a certain literacy rate, and that alphabetic writing is easier to learn than logographic writing.

46. Aesthetics is a good fit for the Parthenon ability, which has now moved to Statue of Zeus, still at Aesthetics. Parthenon gets the ability of Pyramids instead, which fits very well at Republic.

47. Although a Colosseum would fit very well under Republic, it's not a suitable name for a non-wonder building, and feels out of place for any civ that isn't Rome, and out of time after the Classical era. The Colosseum, with its arcades, would require Construction, but for a generic arena, Masonry should be enough.

48. The Republic tech allows Great Scientists to build Academies. Plato founded his Academy in 387 BC, so Academies shouldn't appear in the game long before that.

49. This is a renamed Heroic Epic though with the 3D model or National Epic (which shows a triumphal arch). Three powerful Marble wonders at Literature are too many, and the name "Triumphal Arch" makes it fit under Republic. See also stat-changes.pdf.

50. Requires Literature instead of Writing mostly because this allows Theology to be placed next to Divine Law (formerly Divine Right) in the tree and still have an incoming arrow. It's required both to cover political philosophy as well. In mercantilism, economical policy followed political aims.

51. Replacing Philosophy, which is a too generic name and couldn't lead any Medieval tech. "Alchemy" is easier to integrate and can enable the same items as Philosophy: Taoism comprises Chinese alchemy in a way; Medium, a pacifist school of thought. This doesn't imply that alchemists are pacifists, but at least there's some connection. The Angkor Wat had to move in any case (now at Aesthetics).

The two requirements, Coinage and Iron Working, are both about metallurgy; Coinage could imply knowledge about gold extraction, which relates to the philosopher's stone.

54. The research bonus should give both Monastery and Alchemy a power boost, and acknowledge the role of Christian monasteries in scholarship and education.

55. New tech that takes over Serfdom (from Feudalism) and the spread-irrigation ability (from Civil Service). Feudalism was getting too crowded and should really be a high Medieval tech (middle column). Since Metal Casting and Priesthood have been removed (see Coinage and Polytheism), Crop Rotation brings the tech count to 91, one fewer than in BtS.

Crop rotation has been practiced since prehistory, but this tech represents medieval crop rotation systems like the two-field, three-field, open-field or equal-field system (which justify the Code of Laws requirement) and possibly iron moldboard plows.

56. Serfdom was introduced in the High Middle Ages as part of the European feudal system along with vassalage, but manorialism, an early form of serfdom, emerged in the late Roman Empire (which belongs to the Medieval era of Civ 4).

59. The divine right of kings was a Renaissance concept; not appropriate for the tech that founds Islam. (And the tech doesn't do anything connected to the Mandate of Heaven, which was an ancient concept anyway.) So Versailles moves to Political Economy (formerly Economics) and the link to Nationalism (now Nation State) gets removed.

The name "Divine Law" refers to the Islamic belief that the Quran is the literal word of Allah, and the sharia thus an immutable divine law. The link to Scientific Method could be justified through the analytical reasoning employed in Islamic jurisprudence (fiqh), or more generally through the scientific advances in the Islamic Golden Age.

59. Divine Law needs this move than Theology does, and a caliphate is very much a theocracy.

60. Requires Machinery now (instead of Theology or Civil Service), meaning that we're talking about paper mills. It's the cheap manufacture of a writing material that was crucial for further developments.

Map trade has moved to Compass. It shouldn't really be much harder to join maps gathered by different civilizations than for those gathered by one civilization, so it's difficult to argue which tech should be required from a historical point of view.

61. Civil Service has been replaced by Statecraft, a Classical-era tech, but Bureaucracy should remain a Medieval-era civic, and Paper doesn't have much else to do. This also preserves the relationship between Paper and Civil Service (the former requires the latter in BtS).

62. This requires both Machinery and Feudalism in BtS; now it's either Crop Rotation (which replaces Feudalism as an early-Medieval tech) or Republic (new tech, taking the spot of Drama). The Republic field, allows a direct transition from ancient ranks to medieval ranks, sidestepping Crop Rotation and Feudalism. The Currency (now Coinage) requirement has moved on from Banking to Guilds.

63. Maceman has moved to Guilds from Civil Service (replaced by Statecraft) and Platoon from Engineering. These were both rather bizarre tech requirements; the original developers probably just saw no better way to integrate the Medieval units. It mostly made sense at the discoverers at the onset of the Medieval Age (late 10th century). Nation State is instead an additional requirement for the Federation civic replacing Free Speech.

64. Feudalism requirement since the Bank (now Temple of Kukulcan) improves cities' economy. Guilds need to be visually associated with banking in the game (AD 900).

65. For manufacturing their armor, Macemen require Machinery. Pikemen tended to be less heavily armored, though I guess still heavily enough to make bronze armor unaffordable for most (so at BtS). The heavier Maceman should of course also require Iron. Copper as in BtS; steel (Ironclad) Crossbow can be trained with Copper now.

66. About Plantations on Incense, Dye and Silk, see Agriculture. Spices (e.g. black pepper, cinnamon) and sugarcane had been cultivated long before the Middle Ages, but the cultivated area grew dramatically during the Age of Discovery. Guilds were a part of the trade network that established colonial plantations and delivered the produce to European colonizers. Early cultivation is represented by the natural yields of these resources.

67. As a high Medieval tech, Guilds comes a bit early for the East Indies trade. As a compromise, and because their tech isn't enough room at Guilds for both Plantation and Grocer, Grocer moves to Compass.

68. In BtS, Guilds gives Workshop +1 production, but now Workshop yields 2 production from the beginning (see Pottery). So, instead of increasing the yield, Guilds only lifts the terrain restriction.

69. The English longbow came out around AD 1000, so Longbowman requires Machinery now. The earliest known AD 1000 as in Crossbowman instead, and Longbowman becomes a larger, more flexible unit. Iron Working is required for the arrowheads; see stat-changes.pdf for details.

70. Moved from Guilds (the other requirements are as in BtS; Machinery for manufacturing the armor). Guilds is now for units raised in cities, and Feudalism for units raised in the countryside: peasants (Longbowman) and nobles (Knight).

71. Music should perhaps be named "Art Music" (could explain why it's a Medieval tech, but still wouldn't match the abilities well. The new name refers to arts patronage, which bloomed in the Late Middle Ages. In many cases, e.g. the Sistine Chapel and many cathedrals, the Roman Catholic Church was the patron, which is why Divine Law is required. Fine arts representation of fine arts patronage: The free tech (represented by the shorter tech tree) and Chinese (represented by the shorter tree). The Cultural process – variance commerce into culture (rather than into gold) – is also a decent representation of arts patronage. The free Great Artist moves to Nation State (formerly Nationalism), which now requires Patronage.

Patronage requires Masonry because Masonry isn't required for Construction anymore. To represent only stonemasonry and most buildings in the game could be built with a minimum of stonework. Divine Law must have widespread regardless until the 13th century AD. Conversely, Pikeman and Castle have moved to earlier techs (Guilds, Feudalism).

72. Moved from Nationalism because that tech requirement made no sense and to replace stuff that was moved away from Engineering, in particular the road movement ability (now at Military Studies).

Divine Law (a. k. a Divine Right) is required mostly in order to delay Taj Mahal, the real mausoleum was built in the 17th century. Plus, absolute monarchy as the apex of the late (see Rifling), meaning that Taj Mahal, was a Muslim. To be consistent, Notre Dame requires Theology (and so does Cristo Redentor; see Steel).

73. Requires Alchemy now instead of Iron Working (but Alchemy requires Iron Working). Lodestones were of no use for anything practical prior to the compass, and the main use of the (early) compass was for navigation. One of the major breakthroughs in medieval cartography was that compasses enabled cartographers to create portolan (nautical) charts, featuring compass roses and rhumb lines. Therefore Compass is the right tech for Map trade. Previously at Paper (which made less sense).

74. Moved from Guilds, which didn't have enough room and comes a bit too early for coastal trade. Also, a lighthouse built from reused fortifications should have a stone basis; the Medieval era didn't build many such structures. Moved from Sailing because Optics and the discovery of the Mediterranean Sea shouldn't boost trade across the ocean. In turn, the abolition of Colossus moves to Optics.

75. New tech replacing Chemistry and, in a way, Metal Casting (see Coinage) – blast furnaces are used for smelting iron ore. Cannon needs to be at Steel, which otherwise wouldn't exist until the 18th century (or at least no earlier). Instead, the blast furnace was also in use in the late Medieval period, and this tech fits chronologically much better. As a Chemistry tech, it additionally requires Alchemy.