What the Greeks knew

Piero Scaruffi
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• Part IV: Hellenism
What the Greeks knew

• Macedonia
  – Traditional buffer between Greece and the Barbarians
  – Land of constant warfare
  – A territorial empire, not a city state
What the Greeks knew

- Macedonia
  - Philip II unifies Greece (346 BC - 338 BC) in the League of Corinth
    - 24 years of continuous warfare
    - Aristocratic pyramidal army (unlike Greek egalitarian hoplites)
    - Cavalry (unlike Greek infantry-based army)
    - Mercenaries (unlike Greek orthodoxy)
    - Multi-ethnic (unlike Greek homogeneous army)
    - Lighter and more mobile hoplites armed with pike (twice longer than a spear)
What the Greeks knew

• Macedonia
  – Alexander III conquers the Persian empire (334 BC - 325 BC)
  – Alexander’s army of 334
    • 36,000 in the navy and 37,000 on land (12,000 hoplites from Macedonia, 7,000 hoplites from Greek allies, 5,000 mercenary hoplites; 1,800 horsemen from Macedonia, 1,800 horsemen from Thessalia, 600 horsemen from Greek allies, etc)
    • The Persians at Issus number at least twice as many, multi-ethnic and filled with many mercenaries (Darius’ best general is Memnon of Rhodes)
What the Greeks knew

- Macedonia
  - Basically, Alexander rebuilt Darius' empire two centuries later under Greek civilization (almost the exact same lands under one emperor)
What the Greeks knew

- Alexander’s Empire
  - Note: Alexander, Chandragupta Maurya and Qin Shi were very young when they founded their empires.
What the Greeks knew

• Macedonia
  – Alexander deifies himself (son of Zeus in Macedonia, incarnation of Ra and Osiris in Egypt, court ritual of proskynesis in Persia)
  – Alexander’s empire breaks down into regional Greek-speaking kingdoms (323 BC)
    • Ptolemaic kingdom (Egypt, Palestine)
    • Antigonid kingdom (Macedonia)
    • Seleucid kingdom (Persia, Mesopotamia, Syria and later Asia Minor)
The disintegration of Alexander's empire

The disintegration of Alexander’s empire

What the Greeks knew

- The Hellenistic Age (331 BC)
  - Hellenistic armies: Macedonians, Greeks, mercenaries, natives
  - Huge armies (unlike the armies of the Greek city-states)
What the Greeks knew

- The Hellenistic Age (331 BC)
  - Macedonian conquests… and destruction of Greek cities
  - Foundation of Alexandria (331 BC)
  - Hellenization of eastern Mediterranean
  - …but also Orientalization of Greek culture
  - Cultural unification of the “oikoumene” (world that the Greek knew) on a level not seen since the advent of agriculture during the Neolithic
What the Greeks knew

- The Hellenistic Age (331 BC - 146 BC)
  - Revolution in trade routes and trade practices
    - E.g., Egypt: spices from Arabia, silk from China, carpets from Asia Minor, silver from Spain, gold from India, tin from Britain, etc
  - Trade boom spawns economic boom
  - Monetary revolution based on gold and silver coins
  - State-sponsored capitalism
    - State provides infrastructure (harbors, roads) and protection (warships)
    - State organizes large-scale industries
    - State taxes heavily the profit of merchants
What the Greeks knew

• The Hellenistic Age (331 BC - 146 BC)
  – Multiplication of cities
    • Government agencies
    • Merchants
    • Industry
    • Culture (e.g., Library of Alexandria)
What the Greeks knew

• The Hellenistic Age (331 BC - 146 BC)
  – Alexandria
    • Founded by Alexander in Egypt
    • Alexander’s general Ptolemy I sponsors culture, art and science
    • Ptolemy I founds the “museum” (home of the muses), the Egyptian equivalent of Aristotle’s Lyceum
    • Scholars move from Greece to Alexandria
    • Literature is for the reading public, not for an elite
What the Greeks knew

- Hellenistic Philosophy
  - Emphasis on happiness of the individual
- Hellenistic Religion
  - Emphasis on salvation of the individual
- Birth of Greek individualism
What the Greeks knew

- Library of Alexandria (307 BC)
  - Founded by Ptolemy I
  - Directed by scientists (Eratosthenes)
  - Papyri in Greek, Hebrew, Aramaic, Nabatean, Arabic, Indian, Egyptian
  - Not open to the public
  - Mouseion for the invited scholars
What the Greeks knew

• Books
  – Parchment made of animal skin instead of papyrus (190 BC)
  – Parchment codex instead of papyrus scroll (1st c AD), easier to consult and safer to transport
  – Parchment codex enables more sophisticated illustrations
What the Greeks knew

• Cynicism (350BC)
  – Absolute knowledge is impossible
  – Excessive attachment to material things is the problem
  – Individual freedom through renunciation of material things
  – No property, no money
  – Women and children should be held in common (Diogenes)
  – Return and submit to nature
What the Greeks knew

• Cynicism (350BC)
  – All humans and animals are equal (Diogenes)
  – Anarchy: only freedom brings happiness (Diogenes)
  – Diogenes lived inside a barrel
  – Diogenes was the first kosmopolites (citizen of the world)
  – No surviving book by Diogenes
  – He committed suicide holding his breath
What the Greeks knew

• Materialism
  – Cynicism
  – Epicureanism
  – Stoicism
  – The world is made of matter (even the soul)
  – There are no spiritual beings
What the Greeks knew

• Epicureanism (300BC)
  – Epicurus of Samos (b 341 BC)
    • Wrote a 37-volume book
    • Democritus’ metaphysics
    • The universe is made of an infinite number of atoms moving randomly in empty space
    • Atoms collide and form objects, animals and people
    • A perception is due to physical contact: sight is due to particles that emanate from the object and strike the eye
What the Greeks knew

- Epicureanism (300BC)
  - Epicurus of Samos
    - Humans have no purpose: they just happened to be created by the motion of atoms
    - Humans are simply one of the many kinds of things created by atoms
    - A degree of randomness in the movement of atoms that grants humans a degree of freedom
What the Greeks knew

• Epicureanism (300BC)
  – Epicurus
    • There is no afterlife
    • Happiness/serenity (“ataraxia”) as the highest good
    • Anxiety is the main enemy of happiness
    • Superstitions and fear of death cause suffering/angst and keep us from appreciating life
    • “To practice living well and to practice dying well are one and the same”
What the Greeks knew

- Epicureanism (300BC)
  - Liberation from suffering via a correct theory of nature (reason):
    - Gods exist but have no role in human life
    - Democritus’ materialism: the universe (not created by a god) is material, made of atoms, and is a machine
    - Human beings die with the death of the body
    - Gods are material too (and indifferent to humans)
    - The soul is material
    - But humans have free will: they are free to choose any life they wish
What the Greeks knew

• Epicureanism (300BC)
  – Don’t fear death
    • Don’t fear what comes next just like you don’t fear what was before you were born
    • “While we exist death is not present, and when death is present we no longer exist”
    • “Infinite time contains no greater pleasure than limited time”
What the Greeks knew

• Epicureanism (300BC)
  – There is no absolute definition of right and wrong
  – Humans should be good to each other because it increases happiness (utilitarian approach)
What the Greeks knew

• Epicureanism (300BC)
  – Lucretius (95-55 BC)
  – Seneca (4 BC-65AD)
    • Our life is not short, we make it short by wasting most of it
What the Greeks knew

• Sceptics (300BC)
  – Sophist’ metaphysics: knowledge is derived from the senses and is therefore uncertain
What the Greeks knew

• Sceptics (300BC)
  – Pyrrho (Elis, b 365BC)
  – We can determine (know) nothing, there is no absolute certainty
  – Angst is caused by the search for knowledge because reason cannot explain everything and leads to contradictions
  – There is no way to determine if things (such as sickness or poverty) are good or bad
  – Unhappiness derives from opinions are merely that: opinions, not facts
  – In order to achieve happiness/serenity (ataraxia), one has to avoid judgement/beliefs
What the Greeks knew

• Sceptics (300BC)
  – Carneades (Cyrene, b. 214 BC)
    • No absolute truth, but three degrees of uncertainty:
      – Probable
      – Probable and unrefuted
      – Probable, unrefuted and tested
What the Greeks knew

• Stoicism (300BC)
  – Heracleitus’ metaphysics
What the Greeks knew

• Stoicism (300BC)
  – Zenon of Citium (Cyprus, b. 344 BC)
    • Some things are so obvious that they cannot be doubted (katalepsis)
    • Everything is matter
    • A ubiquitous active principle (a sort of eternal “fire”) is both the source of life and the source of reason (both pneuma and logos)
    • “God” is that original fire (and cosmic mind) who created the original principle (“logos spermatikos”)
    • The interaction between this “God” (“the cause”, “first reason”) and matter creates the world, which is a living organism
What the Greeks knew

• Stoicism (300BC)
  – Zenon of Citium (Cyprus, b. 344 BC)
    • Virtue consists in following the laws of nature
    • Favors a society in which women have the same rights as men (and slaves are citizens too), and in which all women and men can have sex with each other
    • Lectures on the stoas of the Athenian marketplaces (the Stoics were originally called Zenonians)
What the Greeks knew

• Stoicism (300BC)
  – Natural laws are determined by God (the active principle, “the cause”)
  – Laws of nature determine the evolution of the cosmos (cycle from big bang to big crush)
  – Endless cycles, identical in every detail
  – The entire universe is made of god (pantheism)
  – The world is a sentient living being filled with pneuma
  – The universe is a whole in which individual things/events make sense only in relationship to all the other things/events
What the Greeks knew

• Stoicism (300BC)
  – The individual has to accept that the universe is a mechanism and that the future is determined
  – The individual can only submit to the order of the universe
What the Greeks knew

• Stoicism (300BC)
  – Happiness is acceptance of what “is”
  – Happiness is accepting one’s role in the universe
  – Surrendering the self to the order of the cosmos
  – Happiness is acceptance of god/nature
  – Happiness is living in harmony with nature
What the Greeks knew

• Stoicism (300BC)
  – There is no evil because even evil events/things are mere aspects of a whole that is not evil
  – Four cardinal virtues: wisdom, courage, justice, and temperance
What the Greeks knew

• Stoicism (300BC)
  – Inner man vs outer man (the spiritual and rational vs the physical and emotional being)
  – Each person is an embryo of divine fire or cosmic mind
  – The microcosmos (individual soul) is part of the macrocosmos (universal soul)
  – Each person is partly divine
  – "Thou art a piece of God" (Epictetus)
What the Greeks knew

• Stoicism (300BC)
  – All human beings of all nations and all classes are equal (including slaves)
  – Pacifism
What the Greeks knew

• Stoicism (300BC)
  – Society (the polis) is an annoying distraction from what should be the real goal of life
  – Politics is dirty and boring, and certainly not for the wise
What the Greeks knew

• Stoicism (300BC)
  – Chrysippus (b. 280 BC): wrote more than 700 books, mostly on logic
  – Lucius Annaeus Seneca (1\textsuperscript{st} c AD)
  – Epictetus (100AD)
  – emperor Marcus Aurelius (121-180)
What the Greeks knew

• Stoicism (300BC)
  – Invention of propositional calculus
What the Greeks knew

- Revival of Pythagoras
  - Ascetic life, vegetarianism
  - Sex only for procreation, not for pleasure
What the Greeks knew

• Astrology
  – Babylonian astrology: Berossus, priest of Bel Marduk, who settled in the island of Cos in 3rd c BC and wrote a treatise in Greek on the astrological theories of Mesopotamia
  – The stars influence human events
  – The state of the universe at any given moment is more or less favorable to certain actions
  – Man's fortunes are fixed by the position of the stars at the moment of his birth
What the Greeks knew

- Astrology
  - Correspondence between the 12 signs of the zodiac and the parts of the human body
  - Carneades of the Middle Academy critical of astrology on logical grounds (e.g. twins have different fortunes)
  - Epicureans oppose astrology (hostile to predestination)
  - Astrology influential on Hellenistic Egypt
  - Ptolemy himself writes a treatise on astrology ("Tetrabiblos/ Quadripartitum"): prediction of wars, pestilences, earthquakes, etc and prediction of a person's future
What the Greeks knew

- Sex
  - Cynics, Epicureans and neo-Pythagoreans view eros as a danger, encourage celibacy and discourage extramarital affairs
  - Menander’s plays (4th c BC) are set in domestic surroundings: the Samian Chrysis is the mistress (not a prostitute) of a wealthy bachelor; wives tend to have more power
  - Hetaerae become celebrities
  - Philemon ‘s “Neaira” is about the wealth of a young whore
  - Aristophanes of Byzantium (275-180 BC): “On Athenian Courtesans” (also similar books written by Apollodorus of Athens, Ammonius of Alexandria, etc)
What the Greeks knew

• Sex
  – The women of Alexandria enjoy more freedom and power than the women of Athens
    • The queens of Ptolemy I and Ptolemy II become famous (Berenice I and Arsinoe II, also Ptolemy II’s sister)
    • Theocritus’ Idyll 2: the adventures of a single woman, Somaetha
    • Asclepiades: epigrams to independent women who are sexually active
What the Greeks knew

• Sex
  – Nude women for public monuments (not only the rare private vase)
    • starting with Praxiteles ‘“Aphrodite of Cnidus” (4th c BC), whose model was the hataira Phryne (in classical Greece it would have been a mortal sin to pry into a divinity’s intimacy)
  – Literature deals with the grief of women in love
  – Sex manuals (exclusively about heterosex), mostly composed by men under female pseudonyms (pretending to be experienced hetaerae): Polycrates of Athens’ “Philaenis”
What the Greeks knew

• Sex

“Colonna Venus” a copy of the “Aphrodite of Cnidus” (Vatican Museum)

Bronze “Aphrodite” (Metropolitan Museum)
What the Greeks knew

• Sex
  – Plutarch’ “Dialogue on Love/ Erotikos” (1st c AD)
    • Plutarch defends marriage over pederasty
    • A wealthy widow, Ismenodora, kidnaps a younger man, Bacchon, in order to marry him
What the Greeks knew

• Hellenistic Science
  – First major scientific boom in the history of humankind
  – Largely at Alexandria: mathematicians, scientists, inventors, philosophers
What the Greeks knew

• Eukleides/ Euclid (b300BC, Alexandria)
  – Geometry
  – Postulates (parallel lines)
  – A theory of space
  – All the truth that can be deduced from a handful of axioms

• Erarosthenes (b276BC)
  – Calculates the circumference of the Earth
What the Greeks knew

- Herophilus (Alexandria, b335BC)
  - Anatomy (dissection of alive human bodies)
  - The brain, not the heart, is the site of the mind
  - Arteries contain blood, not air
What the Greeks knew

• Archimedes (Siracusa/Syracuse, b287BC)
  – Mathematics and Mechanics
  – Principle of the lever
  – Law of hydrostatics
  – Physics becomes a separate discipline from Philosophy
What the Greeks knew

- Archimedes (b287BC)
  - The Antikythera mechanism, the world’s first computer
What the Greeks knew

• Eratosthenes (Alexandria, b276BC)
  – Calculates the circumference of the Earth
  – Coins the word “geo-graphia”

• Posidonius
  – Tides are due to the influence of the Moon

• Aristarchus (Alexandria, b270BC)
  – The Earth is a planet
  – Planets revolve in circles around the Sun (heliocentric world)
  – Calculates the distance between the Earth and the Moon
What the Greeks knew

- Helepolis, a war machine built by Epimachus for Antigon's son Demetrius during the siege of Rhodes (306 BC) to overcome the city's defensive walls: a 40m-tall pyramidal multi-story moving wooden tower, covered with leather, armed with catapults and equipped with water tanks, mounted on iron wheels.
What the Greeks knew

• Poetry
  – Philitas of Cos,
  – Asclepiades of Samos (erotic epigram),
  – Callimachus of Cyrene (pederastic poetry + “Aetia” + “Lock of Berenice”),
  – Dioscorides (graphic details of both hetero and homoerotic sex),
  – Theocritus (pastoral Sicilian landscape, “Idylls”, first pastoral literature),
  – Apollonius of Rhodes ("Argonautica", with clueless anti-hero Jason helped succeed by Hera, Athena and Aphrodite, and seduced by the witch Medea),
What the Greeks knew

• Poetry
  – Herodas (polemic mimes)
  – Poetesses: Erinna (“Distaff”, homoerotic), Nossis (homoerotic)
  – Demystifying mythic heroes of ancient Greece
What the Greeks knew

• Fiction
  – Chariton's Callirhoe (1st c. AD)
  – Achilles Tatius' Leucippe and Clitophon (early-2nd c.)
  – Longus' Daphnis and Chloe (2nd c.)
  – Xenophon of Ephesus' Ephesian Tale (2nd c.)
  – Heliodorus of Emesa's Aethiopica (3rd c.)
  – All deal with romantic love between two young lovers (a free young man and a free young woman)
What the Greeks knew

• Fiction
  – Euhenemus: “Sacred Scripture” (300 BC)
    • Great conquerors and kings become gods
What the Greeks knew

- **Time-keeping**
  - Late adoption of Egyptian “outflow” water clocks (325 BC)
  - Ctesibius of Alexandria (3rd C BC): the inflow water clock (“clepsydra”)
  - Large-scale water automata
    - Athens' "Horologion" by Andronikos (1st C BC), comprising both sundials and 24-hour water clocks, indicators for the eight winds and the seasons, and astrological data
What the Greeks knew

- The Seven Wonders:
What the Greeks knew

• The Seven Wonders:
  – Pyramid of Cheops (by Hemon, Egypt, 2500 BC)
  – Hanging Gardens (Babylon, 580 BC)
  – The Statue of Zeus at Olympia (by Pheidias, Greece, 432 BC)
  – Temple of Artemis at Ephesos (Greece, 356 BC)
  – The Mausoleum at Halicarnassos (Greece, 354 BC)
  – The Pharos of Alexandria (Egypt, 300 BC)
  – The Colossus of Rhodos (built by Chares of Lindos, 290 BC)
What the Greeks knew

• Colossus of Rhodos

The Colossus (Helios) of Rhodos (built by Chares of Lindos, 290 BC)
What the Greeks knew

- Sostratus: Pharos of Alexandria (279 BC, destroyed by earthquakes in the 14th c)
  - Travel report by Abou-Haggag Al-Andaloussi (1166):
    - Building in three stage
    - Lowest square, 55.9 m high with a cylindrical core
    - Middle octagonal stage 18.30 m wide and 27.45 m tall
    - Circular top 7.30 m tall
    - Total height: 117 m

(Roman coin of 2nd c AD)
What the Greeks knew

• Temple of Apollo at Didyma (330 BC)
  – Fourth largest sanctuary in the Greek world after the Temple of Artemis, the Heraion of Samos and the Olympieion at Sicily
  – Largest arrangement of columns in the Greek world
  – One of the few decastyle temples (ten columns) with Heliopolis (Baalbek) in Syria and some in Roma
  – Begun in 330 BC and never finished
  – Collapsed in the 15th c AD
What the Greeks knew

- Royal necropolis of Sidon (4th c BC): Alexander Sarcophagus

(Archeological Museum, Istanbul)
What the Greeks knew

- Harmony AND passion
- Idealism AND realism

Museo Archeologico, Napoli

Farnese Bull, 150 BC

Musei Vaticani, Roma

"Laocoon" (50BC)
What the Greeks knew

- Old Market Woman (2nd c BC)

Alexandros: "Aphrodite of Milo/ Venus de Milo" (150 BC)

(Metropolitan Museum, New York)

(Louvre Museum, Paris)
What the Greeks knew

- Aphrodites and Pan of Delos (100 BC)

(Athens National Museum)
What the Greeks knew

• Three marble cities of Anatolia: Aphrodisias, Ephesus, Miletus

Athena of Aphrodisias
2nd AD
(Archeological Museum, Istanbul)

Oceanus of Ephesus
2nd AD
(Archeological Museum, Istanbul)

Apollo of Miletus  2nd AD
(Archeological Museum, Istanbul)
What the Greeks knew

- Naiskos
What the Greeks knew

• Alexander’s Sarcophagus

See museums/topkapi.html
(Archeological Museum, Istanbul)
What the Greeks knew

Colossal vase of 340 BC colossal (cartoon of mythological story, perhaps inspired by a theatrical play)

(Boston Museum of Fine Arts)
What the Greeks knew

• First realistic “portrait” statues representing individuals (Egyptian statues of individuals were not meant to be seen: they were for the tombs)
What the Greeks knew

• Theaters
  – Built on a hill because no arches
  – Theater of Dionysus, Athens (330 BC)
  – Theater of Epidaurus (320 BC)

Theater at Epidaurus, 320 BC
What the Greeks knew

• Athens
  – The Western side of the Agora in the 2\textsuperscript{nd} c AD

1. Stoa of Zeus Eleutherios
2. Temple of Apollo Patroos
3. Temple of Hephaestus
4. Metroon - Old Bouleuterion
5. New Bouleuterion
6. Tholos
What the Greeks knew

• Hellenistic Religion
  – Emphasis on salvation of the individual
  – Popularity of “mysteries” (Eleusinian, Dyonisian), whose deities are closer to humans and promise salvation
  – Emphasis on deities that had undergone death and resurrection
  – Initiation to “mysteries” required
  – Initiation could happen any time of the year
  – Oriental mysteries: Osiris (from Egypt, 2nd c BC), Mithra (from Iran, 67 BC), Rhea/Cybele (from Phrygia, 205 BC)
  – 396: The Goths burn the sanctuary of Eleusis
What the Greeks knew

- Eudoxus of Cyzicus travels to India via the Indian Ocean and bring back spices (2nd c BC)
What the Greeks knew

• Sailors
  – Greek sailors discover how to navigate between the Gulf of Aden and India exploiting the two-way monsoonal winds
What the Greeks knew

- Eratosthenes (born 276 BC)
  - Map of the world
What the Greeks knew

- Seleucid Empire
  - Merging of Hellenic and Mesopotamian civilizations
  - Prototype of association of city states
  - Birthplace of religions: Mithraism, Christianity, Manicheism, Islam
What the Greeks knew

Myra (1st c BC)
What the Greeks knew

- Nemrut (1st c BC)
What the Greeks knew

- Petra (3rd c AD)
What the Greeks knew

- Palmyra
Summary

- Trade
- Gods are vehicles of force
- Harmony
- Form and change
- Mathematics (Pythagoras, Zenon, Euclides)
- History (Herodotus, Thucydides)
- Physics (Archimedes, Aristarchus, Ptolemy)
Summary

- Sokrates: Philosophy of Man
- Herakleites: Everything changes all the time
- Parmenides: Nothing ever changes (the One)
- Anaxagorbas: ”Nous” as the universal organizing principle
- Democritus: Everything is made of atoms
- Platon: Reality vs appearance
- Aristoteles: Knowledge via logic and observation, Natural state is rest, God as the first cause of motion
- Cynicism: Abandon wealth and return to Nature
- Epicurianism: Accept that human life is pointless
- Skepticism: Reason leads to contradictions
- Stoicism: Happiness is acceptance of what "is"