

Prof. Rex Li's Writings

Category: Philosophy

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Title: Aristotle and Greek Science

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Summary/ Abstract: This is a chapter summary of Durant (1926) *Story of Philosophy (Chapter 2): Aristotle and Greek Science*: Here we are told that Aristotle is the first biologist!

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Aristotle and Greek Science

Source: Durant - *Story of Philosophy*, Chapter 2 e-version

(A) Life (384 – 322 BC)

- 49 From a medical family, studied in Academy under Plato at age 18 or 30 for 8 or 20 years.
- 50 Aristotle collected books
With fame, served Philip, King of Macedon and tutored Alexander (age 13) for 2 years, became king.
- 51 A critique of Greece by King Philip who pushed for unification of Greece. Durant's interpretation:
of Greece. Philip had no sympathy with the individualism that had fostered the art and intellect of Greece but had at the same time disintegrated her social order; in all these little capitals he saw not the exhilarating culture and the unsurpassable art, but the commercial corruption and the political chaos; he saw insatiable merchants and bankers absorbing the vital resources of the nation, incompetent politicians and clever orators misleading a busy populace into disastrous plots and wars, factions cleaving classes and classes congealing into castes: this, said Philip, was not a nation but only a welter of individuals—geniuses and slaves; he would bring the hand of order down upon this turmoil, and make all Greece stand up united and strong as the political center and basis of the world. In his youth in Thebes he
- R: Athenians called neighbors barbarians
China called neighbors barbarians
Romans was fallen to barbarians
- 52 Chronology – see another idea

(B) Work

- 53 Lyceum with student self-governance!
Focus on science, biology
Found Zoological garden with lots of species of fauna and flora.
- 54 Aristotle had aids / secretaries to support, by Alexander's power
No science experiment, but lots of observation / data.

55

Domains

Logic	Science	Aesthetics	Philosophy
<ul style="list-style-type: none"> ● Categories ● Sophisticated refutation 	<ul style="list-style-type: none"> ● Physics ● Animals ● Botany ● Meterology 	<ul style="list-style-type: none"> ● Poetics ● Rhetorics 	<ul style="list-style-type: none"> ● Ethics ● Politics ● Metaphysics

56

His writings “were largely the compilations of students and followers of his lectures in their notes.”

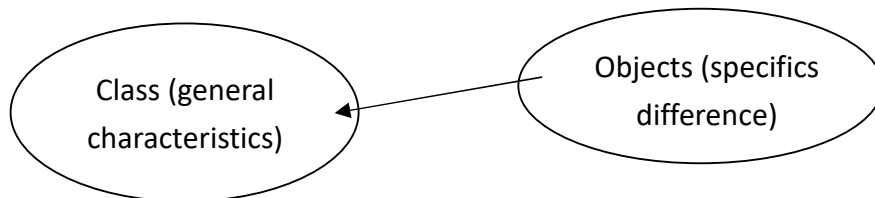
(may be “common editing by the Peripatetic School”)

(C) Aristotle’s Logic

58

Basic ideas of logic

(1) Definition



Man = a rational animal
(object) (class)

(2) Nominalism (Aristotle) VS idealism (Plato)

The ideas of universals (man in general) and particular (a certain person)

59

“realists” and “nominalists.”¹³ A universal, to Aristotle, is any common noun, any name capable of universal application to the members of a class: so *animal*, *man*, *book*, *tree*, are universals. But these universals are subjective notions, not tangibly objective realities; they are *nomina* (names), not *res* (things); all that exists outside us is a world of individual and specific objects, not of generic and universal things; men exist, and trees, and animals; but man-in-general, or the universal man, does not exist, except in thought; he is a handy mental abstraction, not an external presence or *re-ality*.

Now Aristotle understands Plato to have held that universals have objective existence; and indeed Plato had said that the universal is incomparably more lasting and important and substantial than the individual,—the latter being but a little wavelet in a ceaseless surf; *men* come and go, but *man* goes on forever. Aristotle’s is a matter-of-fact mind; as William James would say, a tough, not a tender, mind; he sees the root of endless mysticism and scholarly nonsense in this Platonic “realism”; and he attacks it with all the vigor of a first polemic.

R: We may say that Plato started idealism (forms and ideas) while Aristotle invented nominalism (names and terms) to represent things and reality. Aristotle was the father of logic, metaphysics and realism. Following Plato’s idealism, Asto sees the immortal soul as “pure thought” (p. 71) (Note that Asto is a scientist).

(D) Greek Science

- 63 (1) List of Pre-Aristotle science

Thales (640 – 550 BC)	Astronomer, sun and stars are fireballs
Anaximander (610 – 540 BC)	Make astronomical and geographical charts
Anaxagoras (500 – 428 BC)	Explains solar and lunar eclipses
Heraclitus (530 – 470 BC)	Flow, change, cycle, strife and decay
Empedocles (445 BC)	Evolution, natural selection
Democritus (460 – 360 BC)	Atoms and void

64 (E) Aristotle as naturalist

- (1) His physics is metaphysics, analysing 'ultimate concepts' – space, time, cause, infinity, motion, matter.
- (2) He rejects Democritus' 'void'
- (3) He rejects Pythagoras' solar view, takes geocentric view.
- (4) Cyclic world of change – Egypt is "the work of Nile" water cycle, etc.

65 (F) Aristotle founded Biology

67 According to Durant, there is only scattered observation before Aristotle. He came up with many important ideas through his observation:

- (1) Organisms in minute gradations and progression.
- (2) Life / "dead", plants / animals are at times indistinguishable.
- (3) Structure and function – from simple to complex, from body to brain.

tain things stand out convincingly: that life has grown steadily in complexity and in power;²⁰ that intelligence has progressed in correlation with complexity of structure and mobility of form;²¹ that there has been an increasing specialization of function, and a continuous centralization of physiological control.²² Slowly life created for itself a nervous system and a brain; and mind moved resolutely on towards the mastery of its environment.

R: It is so much like Spencer.

- (4) Survival of fittest and intelligence

evolution. He rejects Empedocles' doctrine that all organs and organisms are a survival of the fittest,²³ and Anaxagoras' idea that man became intelligent by using his hands for manipulation rather than for movement; Aristotle thinks, on the contrary, that man so used his hands because he had become intelligent.²⁴ Indeed, Aristotle makes

- (5) Taxonomy of Zoology
 - Birds / reptiles / monkey / mammals / (viviparous quadrupeds)
 - Diet determines modes of life.
- (6) Spencer's generalization
anticipate Spencer's generalization that individuation varies inversely as genesis—that is, that the more highly developed and specialized a species or an individual happens to be, the smaller will be the number of its offspring.³⁰ He notices and explains reversion to type—the tend-
- (7) Heredity and characteristics
A step from Mendel

(G) Aristotle's Metaphysics

See another idea

70
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(H) Aristotle's Psychology and Art

72

- (1) Durant dwells on free will and determinism.
- (2) Aristotle sees habit as second nature
- (3) Aesthetics as emotional expression

72
|

(I) Aristotle's Ethics and happiness

77

See another idea

(J) Education

- (1) Aristotle believed the state should control education and teach citizens to obey the law.

Education, too, should be in the hands of the state. "That which most contributes to the permanence of constitutions is the adaptation of education to the form of government. . . . The citizen should be moulded to the form of government under which he lives."⁸² By state control of schools we might divert men from industry and trade to agriculture; and we might train men, while keeping property private, to open their possessions to discriminately common use. "Among good men, with respect to the use of property, the proverb will hold, that 'friends should have all things in common.'⁸³ But above all, the growing citizen must be taught obedience to law, else a state is impossible. "It has been well said that 'he who has never learned to obey cannot be a good commander.' . . . The good citizen should be capable of both." And only a state system of schools can achieve social unity amid ethnic heterogeneity; the state is a plurality which must be made into a unity and a community by education.⁸⁴ Let youth be

- (2) Social control gives man virtue
gluttony and lust." And only social control can give him virtue. Through speech man evolved society; through society, intelligence; through intelligence, order; and through order, civilization. In such an ordered state the individual has a thousand opportunities and avenues of development open to him which a solitary life would never give.

(K) Democracy and Aristocracy

(1) Aristotle is against democracy

Yet democracy is on the whole inferior to aristocracy.⁹² For it is based on a false assumption of equality; it “arises out of the notion that those who are equal in one respect (e. g., in respect of the law) are equal in all respects; because men are equally free they claim to be absolutely equal.” The upshot is that ability is sacrificed to number, while numbers are manipulated by trickery. Because the people are so easily misled, and so fickle in their views, the ballot should be limited to the intelligent. What we need is a combination of aristocracy and democracy.

(p. 85)

(2) Constitution government

Constitutional government offers this happy union. It is not the best conceivable government—that would be an aristocracy of education—but it is the best possible state. “We must ask what is the best constitution for most states, and the best life for most men; neither assuming a standard of excellence which will be above ordinary persons, nor an education exceptionally favored by nature or circumstance, nor yet an ideal state which will be only an aspiration; but having in mind such a life as the majority will be able to share, and a form of government to which states in general can attain.” “It is necessary to begin by

(p. 85)

(3) But he supports liberty and privacy

others; conservative though he is, Aristotle values individual quality, privacy, and liberty above social efficiency and power. He would not

(p. 78)