THE GENESIS OF GREEK INTELLECTUALITY IN ISLAMIC AND WESTERN HISTORIOGRAPHIES OF SCIENCE: A COMPARATIVE OVERVIEW

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Khulasah

Pandangan arus perdana berpaksi Eropah-Yunani mengenai asal-usul pemikiran Yunani purba semakin dilihat bermasalah bila disuluhi hasil kajian semula terhadap teks-teks Yunani klasik, sejarah perbandingan pemikiran serta teori sistem dunia, dan kini dalam proses dirumuskan semula. Dalam makalah ini, masalah ini ditinjau dengan merujuk kepada sudutpandang kesarjanaan Islam klasik dan membandingkannya dengan hasil pandangan perumusan semula.

Katakunci: Asal usul falsafah dan sains Yunani; logik dan nahu; Martin Bernal; *Black Athena*; Abū Bishr Mattā ibn Yūnus; Abū Sa'īd al-Sīrāfī; Abū Naṣr al-Fārābī; *Kitāb al-Ḥurūf*; Ṣā'id al-Andalusī; *Ṭabaqāt al-Umam*; Plato; Aristotle; sudutpandang perumusan pengkajian semula; sudut pandang arus perdana.

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Abstract

Standard, helleno-eurocentric accounts of the genesis of classical Greek rationality are increasingly being found to be problematic in the light of the classical texts themselves, comparative intellectual history and world system theory, and are hence in the process of being systemically revised. Here, a hopefully fresh contribution to the revisionist project is attempted by referring to the classical Islamic viewpoint on this question and comparing it briefly to result so far obtained in the ongoing debate between the standard and the revisionist models of the genesis of Greek rationality.

Keywords: Origins of Greek philosophy and science; logic versus grammar; Martin Bernal; *Black Athena*; Abū Bishr Mattā ibn Yūnus; Abū Sa'īd al-Sīrāfī; Abū Naṣr al-Fārābī; *Kitāb al-Ḥurūf*; Ṣā'id al-Andalusī; *Ṭabaqāt al-Umam*; Plato; Aristotle; revisionist viewpoint; standard viewpoint.

Introduction

Over the past couple of decades or so, there has been extensive rethinking of the origins of Greek science and philosophy, most exemplified perhaps in Martin Bernal's erudite and far ranging three volume *Black Athena: The Afroasiatic Roots of Classical Civilization*,[2] which sees the Greek achievement as less unique and isolated than embedded in the larger, cosmopolitan civilizational region of the Levant (i.e., eastern Mediterranean, including Egypt, Anatolia, Phonecia and Babylon).[3] This systemic rethinking or revisionist viewpoint in turn has provoked heated responses from proponents of the standard view of the uniqueness and "splendid isolation" of the Hellenic achievement, as exemplified in

2 3 vols. (New Brunswick, NJ: Rutgers University Press, 1987—2006).

3 J. M. Sasson, ed. in chief, *Civilizations of the Ancient Near East*, 4 vols. (New York: Scribner's, 1995).

Mary Lefkowitz's *Not Out of Africa: How Afrocentrism Became an Excuse to Teach Myth as History*.[4]

Since much of Greek classical thought was recovered and revived in the Latin West (after it was pretty much neglected, even suppressed, by the Byzantines though they were themselves Greeks[5]) through the intellectual mediacy of Islamic Civilization, it should be worthwhile to explore, even cursorily as is being done here, how classical Islamic intellectuals and scholars viewed the origins of the Greek intellectual edifice they so critically admired, and eventually "appropriated"[6]; in short, how Islamic historiography[7] of science views the genesis of Greek rationality. Though there seems to be no evidence in the classical Islamic sources surveyed so far of the kind of dedicated, empirically fine-tuned debate over the genesis of Greek intellectuality and rationality we now observe with much interest in modern academia, the question was nonetheless raised and discussed (at times with remarkable analytic finesse[8]), often as an incidental part of a larger (e.g., origins of the sciences in general[9]) or separate (e.g., relative merits of logic and

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4 (New York: Basic Books, 1997). See also the collection of critiques of Bernal's thesis in M. R. Lefkowitz and Guy MacLean Rogers, eds., *Black Athena Revisited* (Chapel Hill & London: University of North Carolina Press, 1996).

5 As pointed out in captivating detail by, for instance, George Saliba, *Islamic Science and the Makings of the European Renaissance* (Cambridge, MA: MIT, 2006), 4—7, 41—48, in which Saliba also draws attention to the fact that this neglect and suppression were already noted by ibn Nadīm and al-Fārābī.

6 A. I. Sabra, "The Appropriation and Subsequent Naturalization of the Greek Science in Medieval Islam: A Preliminary Statement," in *History of Science*, vol. 27 (1987), 223—43; idem., "Science and Philosophy in Medieval Islamic Theology: The Evidence of the Fourteenth Century," in *Zeitschrift für Geschichte der Arabisch-Islamischen Wissenschaften*, 9 (1994), 1—42; idem., "*Kalām* Atomism as Alternative Philosophy to Hellenizing *Falsafa*:," in James E. Montgomery, ed., *Arabic Theology, Arabic Philosophy: From the Many to the One: Essays in Celebration of Richard M. Frank*, Orientalia Lovaniensia Analecta (Leuven: Peeters, 2006), 199—272.

7 A study of Islamic historiography in general is Franz Rosenthal, *A History of Muslim Historiography* (Leiden: Brill, 1968).

8 As in the debate between al-Sīrāfī and Mattā (see note 10 below).

9 As in Ṣā'id al-Andalusī's *Ṭabaqāt al-Umam* (see note 21 below), and in Abū Naṣr al-Fārābī's *Kitāb al-Ḥurūf* (*Book of Letters*), Arabic text edited and introduced with notes by Professor Muhsin Mahdi, 2nd ed. (Beirut: Dār al-Mashriq, 1990), 131—161 passim.

grammar[10]) discursive concern.

As indicated in its title, this article is only an overview, not at all an extensive survey. It deliberately serves to motivate thinking Muslims to get engaged in the various aspects of the origins of science debate and thereby contribute constructively to its eventual outcome instead of remaining passive spectators, or worse, indiscriminate consumers of the intellectual products of others.

The Classical Islamic View

In his celebrated debate on the relative merits of logic (*al-manṭiq*) and grammar (*al-naḥw*) with the Nestorian logician and philosopher Abū Bishr Mattā ibn Yūnus (ca. 256—328/ ca. 870—940), the grammarian and theologian (*al-naḥwī wa al-mutakallim*) Abū Sa'īd al-Sīrāfī (280—368/893—979) refutes the former's contention in respect of the ancient Greeks that "of [all] nations, it was they who applied themselves to the pursuit of wisdom (*ḥikmah*) and to the apparent and hidden aspects of this world."[11] Al-Sīrāfī counter-argues by saying that such a claim for Greek intellectual distinctiveness and superiority is colored by subjective bias, namely by Mattā's dogmatic and excessive predilection for Aristotelian logic, while the objective fact of the matter is that all nations are equal with respect to being naturally endowed with the mental acumen for pursuing whatever sciences, arts and skills they choose to pursue. For al-Sīrāfī, the Greeks were "like any other nation, they hit the mark in certain things and missed in others, knew certain things and were ignorant of others, and did well under certain conditions and badly under others."[12]

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10 As in the celebrated debate between Abū Sa'īd al-Sīrāfī (280—368/893/979) and Abū Bishr Mattā ibn Yūnus (ca. 256—328/ca. 870—940) well described and set in context in Muhsin Mahdi, "Language and Logic in Classical Islam," in G. E. von Grunebaum, ed., *Logic in Classical Islamic Culture* (Wiesbaden: Otto Harrassowitz, 1970), 51—84. For debate itself, see Abū Ḥayyān al-Tawḥīdī (d. 414/1023), *Kitāb al-Imtā' wa al-Mu'ānasah*, ed., Aḥmad Amīn and Aḥmad al-Zayn, 3 vols. (Cairo: Lajnat al-Ta'līf, 1939—1944), 1: 108.5—128.19.

11 *Ibid*., 67.

12 Muhsin Mahdi, "Language and Logic in Classical Islam," 68; cf. Gerhard

Abū Naṣr al-Fārābī (870—950/256—339) in his interesting and conceptually rich *Kitāb al-Ḥurūf* (*Book of Letters*) discourses at some length on the genesis of philosophy and the sciences and the arts in general, and ties these to the origin and development of intellectual conceptions in the human mind and their expression in ordinary and technical language. Professor Muhsin Mahdi points out that the *Kitāb al-Ḥurūf* is "important for the student of pre-modern linguistic theory, and theories of the origin and development of religion, science and philosophy."[13] In quite a number of ways al-Fārābī's approach to this issue prefigures the manner in which Noam Chomsky attempts to build up, on the basis of his cognitive theory of the language forming capacity, an analogous theory of the "science forming capacity"[14] common to all human beings inasmuch as they are all *thinking* beings. Given al-Fārābī's general, meta-linguistic and meta-logical approaches,[15] it is unsurprising to find his thoughts on the origins of the philosophical sciences to be more *humano-* rather than helleno-centric, though he is well

Endress, "The Debate Between Arabic Grammar and Greek Logic," in *Journal for the History of Arab Science*, vol. 1, no. 2 (November, 1977).

13 Abū Naṣr al-Fārābī's *Kitāb al-Ḥurūf* (*Book of Letters*), Arabic text edited and introduced with notes by Professor Muhsin Mahdi, 2nd ed. (Beirut: Dar al-Mashriq, 1990), xi; cf. Muhsin Mahdi, "Science, Philosophy and Religion in Alfarabi's Enumeration of the Sciences," in J. E. Murdoch and E. D. Sylla, eds., *The Cultural Context of Medieval Learning*, Boston Studies in the Philosophy of Science, vol. 26 (Holland: D. Reidel, 1975), 113—147.

14 Noam Chomsky, *Language and Problems of Knowledge: The Managua Lectures* (Cambridge, MA: MIT, 1989), 156—159, in which he says, "As part of the human biological endowment the scientist is endowed with a certain conceptual apparatus, certain ways of formulating problems, a concept of intelligibility and explanation, and so on. Call this "the science-forming capacity." As in other cases it may contain hidden resources that come to be recognized and used as the contingencies of life and experience permit, so access to this endowment may change over time. But we may assume it to be fixed, in the manner of the language faculty." (on page 156).

15 See also the interesting, comparative study by Shukri B. Abed, *Aristotelian Logic and the Arabic Language in Alfarabi* (Albany: SUNY, 1991). Many thanks to Dr. Sachi Arafat of the University of Glasgow for bringing this study and the *Kitāb al-Ḥurūf* to my attention. Cf. Fuad Haddad, *Alfārābī's Theory of Communication* (Beirut: American University of Beirut, 1989), and idem, "Al-Fārābī's Theory of Language," in Fuad Sarraf and Suha Tamim, eds., *American University of Beirut Festival Book* (Festschrift) (Beirut: American University of Beirut, 1967).

known as a prolific if critical admirer of the philosophical systems of Plato and Aristotle.[16] Having followed closely the logic-grammar debate and been queried about his response to it, the sophisticated al-Fārābī is unlikely to have gone the way of unargued assertion of Greek intellectual superiority, especially as expressed in Aristotelian logic, that has caused Mattā to come to grief in his exchange with al-Sīrāfī.[17]

According to Abū Ma'shar Ja'far b. Muḥammad b. 'Umar al-Balkhī (171—272/787—886) in his *Kitāb al-Ulūf*:[18] "All knowledge is really one, granted by God to the first Hermes, who is also Hushank, Enoch, and Idrīs."[19] He goes on to say that the Greeks learned their sciences from Hermes the Third, a great Egyptian scholar, who taught the sciences to Asclepius the Syrian, who in turn taught the Ionians.[20] So, according to this view, it was through the Egyptians and Syrians that the ancient sciences were acquired by the Ionians who then transmitted them to the rest of the Greek speaking world.

In his well known book, *Ṭabaqāt al-Umam*, Ṣā'id al-Andalusī (420—462/1029—1070)[21] lists four nations who

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16 See, for instance, Muhsin Mahdi, trans., *Al-Farabi's Philosophy of Plato and Aristotle* (Ithaca: Cornell University Press, 1969).

17 Abū Naṣr al-Fārābī's *Kitāb al-Ḥurūf* (*Book of Letters*), 47—49.

18 See David Pingree, *The Thousands of Abū Ma'shar* (London: Warburg Institute, 1968). The Arabic text is included in Section II of this study. For a short biographical sketch, see Robert Zoller, "Abū Ma'shar: Prince of Astrologers," (http://www.new-library.com/zoller/features/rz-article-abumashar.shtml).

19 Ibid., 18.

20 Ibid. The Ionians were an ancient Greek speaking people inhabiting the coastal region of Anatolia.

21 See Sema'an I. Salem and Alok Kumar, trans. and eds., *Science in the Medieval World: "Book of the Categories of Nations"* by Ṣā'id al-Andalusī (Austin: University of Texas Press, 1991). An introduction to Ṣā'id al-Andalusī and his book, together with a full translation is presented in this study, but, unfortunately, without an accompanying Arabic text. Useful bibliographical information and notes relevant to Ṣā'id al-Andalusī's book can be found in M. S. Khan, "A Chapter on Ancient Chaldean Sciences in an Eleventh-Century Hispano-Arabic Work," *Islamic Quarterly*, XVI no. 1—2 (1972), 14—35 passim. See also M. S. Khan, "*Ṭabaqāt al-Umam* of Qāḍī Ṣā'id al-Andalusī," in *Indian Journal of History of Science*, 30 (2—4), 1995 (http://www.new.dli.ernet.in/rawdataupload/upload/insa/INSA_1/20005abc_133.pdf); see also idem, "Qāḍī Ṣā'id's Introduction to his *Tabaqāt al-Umam*," in *Islam & Science* (Winter 2004); I am indebted to Professor Dr. Aref Nayed for drawing my attention to Ṣā'id al-Andalusī's work when I was his student at ISTAC during the years

cultivated the sciences prior to the Greeks, namely the Egyptians, the Chaldeans, the Indians and the Persians, and notes the indebtedness of Ptolemy in his *Almagest* to the observational records of the Chaldeans.[22] In the chapter on science in Greece, he mentions that Empedocles (fl. ca. 444 BCE) studied philosophy with Luqmān the sage in Syria, that Pythagoras studied philosophy and geometry in Egypt, and that from there these sciences were introduced by the latter into Greece.[23] He goes on to mention the intellectual connections of Thales,[24] Socrates, Plato, and Aristotle to Pythagoras and the Pythagorean school.[25] As for science in Egypt, he mentions, among others, that "After the Flood, there lived in Egypt scientists who were knowledgeable in all aspects of science and philosophy, including mathematics, the physical sciences and theology."[26]

In his celebrated *'Uyūn al-Anbā' fī Ṭabaqāt al-Aṭibbā'*, the noted historian of medicine, Ibn Abī 'Uṣaybi'ah (d. 667 or 668/1269 or 1270) is of the opinion that "Allāh created the art of medicine and inspired it into [the hearts] of man." Apparently, he also concurs with the view that this genesis of medical science in divine inspiration applies also to all other arts and sciences.[27] He then goes on to relate the traditions of the Nabateans, the Chaldeans, and the Syrians that the Greeks acquired the medical sciences from India and Egypt.[28]

In a work of that remarkable scholarly society or rather loose, informal network of intellectuals called the Ikhwān al-Ṣafā (The Fellowship of the Pure-Hearted[29]), entitled: *Dispute between Man and the Animals*, there is a dialogue in

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1996—1997.

22 M. S. Khan, "A Chapter on Ancient Chaldean Sciences', 15, 22, 28; Salem and Kumar, *Science in the Medieval World*, xxi, xxii, 19.

23 Salem and Kumar, *Science in the Medieval World*, 21.

24 Ibid., 25.

25 Ibid., 22—23.

26 Ibid., 36.

27 Ibn Abī 'Uṣaybi'ah, '*Uyūn al-Anbā' fī Ṭabaqāt al-Aṭibbā*' (Beirut: Manthūrat Dār Maktabat al-Ḥayāh, n.d.), 13—14.

28 Ibid., 8.

29 Admittedly a somewhat freer rendering of the standard translation as Brethren of Purity (ca. 10th century CE).

which a Greek is reprimanded for boasting too much of the scientific achievements of his people. He is reminded and brought to admit that the Greeks did not discover their sciences by their "own penetration," but rather that they had acquired them from the Jews of Ptolemy's time, and (earlier still) from the Egyptians of (King) Psammethichus (of the Saite dynasty),[30] and that they later introduced them into Greece.[31]

Ibn Ḥazm al-Andalusī (ca. 392—463/994—1064) in his short but important treatise, *Marātib al-'Ulūm (The Ranks of the Sciences)* emphasizes the universality of the philosophical and natural sciences to all civilizations. He views astronomy, mathematics, medicine and philosophy as sciences that have been commonly cultivated by all civilizations, thus he says:

> The sciences (*al-ulūm*) prevailing today are divided into seven divisions among all nations in all places and at all times. These are: the religious law (*ilm sharīah*) of every nation (*ummah*) for every nation must have some doctrines, whether they are established truths (*athbāt*) or falsehoods (*abṭāl*); and the science of the annals (*akhbār*) of a nation; and the science of its language (*lughah*). Nations are distinctive with respect to these three sciences. As for the remaining four sciences, they are common to all nations, and these are: philosophy (*al-falsafah*) which is the knowledge of things as they are according to their definitions (*ḥudūdihā*) from the highest genera (*alā al-ajnās*) to the particulars (*al-ashkhāṣ*), including knowledge of metaphysics (*ilāhiyyah*); and knowledge of astronomy (*al-hay'ah*); and knowledge

30 The 26th and last great independent dynasty of Egypt (663—525 BCE).

31 Trans. J. Platt (London: W. H. Allen, 1869), 133—134, cited in Seyyed Hossein Nasr, *An Introduction to Islamic Cosmological Doctrines* (London: Thames & Hudson, 1978), 38—39. A similar version is cited in George Sarton, *Hellenistic Science and Culture in the Last Three Centuries B. C.*, reprinted (New York: Dover, 1993), 246. See also the newer translations by Lenn Evan Goodman, *The Case of the Animals Versus Man before the King of the Jinn* (Boston: Twayne, 1978); and Rabbi Anson Laytner, *The Animal Lawsuit against Humanity* (Kentucky: Fons Vitae, 2005).

> of numbers (*al-'adad*); and knowledge of medicine (*al-ṭibb*), which concerns aiding the care of the bodies (*mu'ānāt al-ajsām*).[32]

As for Ibn Khaldūn (d. 1406), he reports the Greeks as having taken the intellectual sciences from the Persians and traces the intellectual genealogy of Aristotle through Plato and Socrates to the students of Luqmān the Wise.[33] He also has what we would now call a *humanocentric* view of the origins of the intellectual sciences:

> The intellectual sciences are natural to man, in as much as he is a thinking being. They are not restricted to any particular religious group. They are studied by the people of all religious groups who are all equally qualified to learn them and to do research in them. They have existed (and been known) to the human species since civilization had its beginning in the world. They are called the sciences of philosophy and wisdom.[34]

In their thinking on intellectual history and the genesis of the sciences in human culture, classical Islamic scholarship, as expressed in the views of the above mentioned thinkers and others like Miskawayh (421/1030), al-Jāḥiẓ (d. 255/868—869), Abū Zakariyyā Yaḥyā ibn 'Adī (d. 974 CE) and Abū Sulaymān al-Sijistānī (d. 985 CE), readily notes the "interdependence of civilizations," and subscribes to the notion of an "eternal

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[32] Ibn Ḥazm al-Andalusī, *Marātib al-'Ulūm* in I. R. Abbas, *Rasā'il Ibn Ḥazm al-Andalusī* (Cairo, 1954), cited in Hairuddin Harun, *Daripada Sains Yunani kepada Sains Islam: Peranan dan Proses Penyerapan Sains Asing ke dalam Sains Islam Klasikal* (Kuala Lumpur: Penerbitan Universiti Malaya, 1992), 14—15. See also the edition and translation of *Marātib al-'Ulūm* (as *The Categories of the Sciences*) with accompanying Arabic text by Anwar G. Chejne, *Ibn Ḥazm of Cordova and His Conception of the Sciences* (Chicago: Kazi Publications, 1982), 188—214 on 204 (translation), and 215—251 on 236 (Arabic text). The translation given here is my slight modification of Chejne's.

[33] Ibn Khaldun, *The Muqaddimah*, trans. Franz Rosenthal, 3 vols. (Princeton, NJ: Princeton U. Press, 1958) 3: 113—115.

[34] Ibid., 3: 111.

wisdom" manifesting itself through the temporal cultural achievements of *different yet interacting* nations at different historical epochs.[35] So this view is at once theocentric and humanocentric and hence truly objective: *theocentric* because of its affirmation of a transcendent, divine source of wisdom, and *humanocentric* because of its affirmation of the thinking intellect or "theorizing consciousness"[36] as being the common property of all human beings instead of being a sudden, novel and exclusive discovery of a particularly privileged ethnic group such as the Greeks (as Marias would have it).[37] In contrast to this theocentric and humanocentric understanding of human rationality, helleno-eurocentrism is simply rationalized racism and intellectual imperialism masquerading as objective scholarship whether its practitioners realize it or not.

The Contemporary Islamic View

In his many years of academic and public lectures, Professor Syed Muhammad Naquib al-Attas has often mentioned the Greeks as having taken elements of their philosophy from the religious sages of the East. Thus he says for instance:

> That is why I have often said that a lot of these Greek ideas did not just come from their own minds, they came from revelation. And remember that these Greek philosophers studied in the East, they studied in Egypt. They learned a great deal from Eastern religions. To say that everything seems to come

35 Franz Rosenthal, *The Technique and Approach of Muslim Scholarship* (Rome: Pontificum Institutum Biblicum, 1947), 69—74. This book has been translated into Arabic as *Manāhij al-'Ulamā' al-Muslimīn fī al-Baḥth al-'Ilmī* (Beirut: Dār al-Thaqāfah, 1983).

36 Julian Marias, *History of Philosophy* (New York: Dover, 1967), 4.

37 Ibid., where he says that this "theorizing consciousness" is a "new human outlook" which "appears in Greece one day for the *first time* in history, and from that moment there is something *radically* new in the world, something which makes philosophy possible," (emphases added). Sigh! It does seem that in this hyper-rationalized age, erudite philosophizing is simply no antidote to crass dogmatism.

> from the Greeks is not true. I think more research has to be done on this, maybe some of us might be doing this. But now every new idea is put into the mouths of Aristotle and other Greek philosophers so much so that they seem to be the owners of every idea in the world today such as the idea of ethics and the ideas of virtues, justice, and wisdom. These ideas did not originate from the human mind, they could not have come from the human mind but from revelation. If they had come from the human mind then they should be able to define these ideas because they should already be known to them. The fact that they could not define these things mean[s] that the ideas did not come from the human mind. And if we define it in a certain way, our definition is merely based on Revelation. If it is not based on Revelation then it cannot be defined properly.[38]

Professor Hairuddin Harun, a Malaysian historian of science, has given a brief but interesting comparative overview of Muslim and Western historiograhies of science in his useful book, *Daripada Sains Yunani Kepada Sains Islam (From Greek Science to Islamic Science)*.[39] According to him, Western historiography of science begins from the assumption of secular evolutionism.[40] This approach views the rise of the crafts and the sciences in terms of factors brought about by fortuitous, trial and error adaptations of human beings to the ever changing conditions of their socio-natural environment. Obviously such a viewpoint allows no room for the traditional Islamic notion of transcendent divine inspiration in the genesis of the intellectual and the

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38 From his ISTAC course lectures on "The Religion of Islam," delivered weekly between February 1—May 14, 1998, unpublished transcripted text for private circulation, transcripted from audio recordings by Wan Mohd Shukri, ISTAC, Kuala Lumpur, Lecture 9, pages 243—244.

39 Hairuddin Harun, *Daripada Sains Yunani kepada Sains Islam: Peranan dan Proses Penyerapan Sains Asing ke dalam Sains Islam Klasikal* (Kuala Lumpur: Penerbitan Universiti Malaya, 1992).

40 Or historical evolutionism.

technical arts.

In constrast, in Islamic historiography of science, the role of divine inspiration is emphasized over mere "unaided" human intellection in the genesis of the sciences, arts and crafts, since all human knowledge, in the final analysis, comes from God. Hence, Muslim historians of science do not reject outright traditional reports that God from time to time revealed the sciences and the technical arts to Ādam (peace be on him) and the prophets and sages among his progeny, moreover since these reports find reasonance in many verses of the Qur'ān itself.[41] In the case of Nabī Dāwūd (*'alayhi al-salām*), for example, the Qur'ān states that Allāh has rendered iron pliable for him that he would forge large coats of mail thereof (*alannā lahū al-ḥadīda an i'mal sābighātin*),[42] meaning, according to al-Imām al-Mufassir Fakhr al-Dīn al-Rāzī (d. 1206 CE), that Allāh has inspired him *(alhamnāhū*) with the knowhow to do so.[43]

This *theocentric* viewpoint of the genesis of the sciences is usually considered to be religiously dogmatic (i.e., not independently examinable in principle) and hence rejected as being not amenable to scientific and historical inquiry. However, a religious viewpoint can be reformulated in terms quite amenable to objective empirical inquiry, in which case it becomes no more dogmatic than the mainstream secular, "rational" evolutionary viewpoint. When re-expressed as formulations of testable and competing empirico-historical hypotheses, each of the two viewpoints will have to have its respective claim to objective truth supported by reference to the available documentary, archaeological and linguistic evidence, by valid analogies from historical and contemporary experience, and *then* by showing that the accumulated evidence overwhelmingly tends to confirm its

41 Hairuddin Harun, *Daripada sains Yunani kepada Sains Islam*, 10—11, 30—31.

42 *Sūrah al-Saba'*, 34: 11. Translation based on Marmaduke Pickthall, *The Meaning of the Glorious Qur'an: Texts and Explanatory Translation* (Mecca: Muslim World League, 1977).

43 Fakhr al-Dīn al-Rāzī, *al-Tafsīr al-Kabīr* (also known as *Mafātīḥ al-Ghayb*), 32 parts in 11 vols. (Beirut: Dār Iḥyā' al-Turāth al-'Arabī, 1997), vol. 9 (part 25), 196.

claim rather than that of the other. Some would still argue that such an investigative process, even if possible and actually carried out, does not lead to certainty, but then, the truth discoverable in each domain of inquiry will have to be assigned its appropriate and valid degree of certainty. It is one thing to say that the study of history (or other 'soft' sciences) does not lead to that degree of (formal?) certainty which is to be found through the pursuit of, say, mathematics (or other 'hard' or 'exact' sciences), but quite another to say that no truth or certainty whatsoever is attainable about history (or about other so-called "soft" sciences for that matter).[44]

Harun is of the view that the historical development (i.e., development in history) of natural philosophy, science and technology in a civilization is conditioned on the interactive roles of three main factors, namely (i) socio-economic and material (environmental) limitations, (ii) the relation between knowledge and (intellectual and political) authority, and (iii) the political and cultural milieu of society.[45] Thus he views science and technology as part and parcel of the total socio-intellectual process of the community that produces them, and this process could well involve cross-cultural, inter-communal and inter-regional influences.

[44] As a matter of fact, it can be shown with the utmost degree of certainty that all the hardest and exactest of sciences, mathematics not excluded, are in fact more or less rigorous formalizations of what are at bottom very, very soft human and social sciences imbued with human and social values. Instead of being a worrisome prospect this realization can in fact be very intellectually liberating for it frees the mind from being enslaved to misconceived, misplaced and misapplied formalisms, most exemplified perhaps in neo-liberal econometrics which forces the real into the formal instead of *fitting the formal into the real*. For more on this see Adi Setia, "Some Upstream Research Programs for Muslim Mathematicians: Operationalizing Islamic Values in the Sciences through Mathematical Creativity," in *Islam & Science* (Winter 2008), 153—196, and the references therein.

[45] Ibid., 8—9.

The Modern Standard and Revisionist Views

Harun's "total" viewpoint reasonates rather well with the post-eurocentric, revisionist one[46] which sees the rise of Greek science *not* as the result of any single, largely insular "paramount causal factor"[47] such as Havelock's "alphabetic" literacy,[48] Lloyd's "free legal and political debate,"[49] Frankfort's "intellectual courage" and "emancipation of thought from myth,"[50] Marias's "theorizing consciousness,"[51] Coplestone's "genius,"[52] and Guthrie's "disinterested intellectual inquiry,"[53] or even Percy's "pedagogic pederasty,"[54] *but* rather as the result of "a particular political and economic conjuncture and the accumulated 'science' of many different cultures."[55] Hence Anthony Preus argues that ancient Greek philosophy occurred *before* Western Civilization occurred," and that it is a "*Near Eastern* cultural phenomenon" belonging to the "same larger culture as ancient Egypt, the Hebrews of the Bible, Phoenicia, and Carthage, Babylonia and Chaldean astronomy, and the Persian Magi."[56]

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46 The revisionist viewpoint is outlined at some length in Adi Setia, "The Genesis of Greek Science in the Intellectual Adventure of Ancient Man," in *al-Shajarah*, vol. 4, no. 2 (1999), 125—173; and idem, "The Genesis of Greek Philosophico-Scientific Thought in the Light of World System Theory," *al-Shajarah*, vol. 5, no. 1 (2000), 127—188.

47 Martin Bernal, "Response to Robert Palter," *History of Science*, 32 (1994), 457.

48 Eric A. Havelock, *The Literate Revolution in Greece and Its Cultural Consequence* (Princeton, NJ: Princeton University Press, 1982).

49 G. E. R. Lloyd, *Methods and Problems in Greek Science: Selected Papers* (Cambridge: Cambridge University Press, 1991), 131; see counter-arguments to Lloyd in Heinrich von Staden, "Affinities and Elisions: Helen and Hellenocentrism," in Isis 83 (1992), 590—595.

50 Henri Frankfort *et.al*., *The Intellectual Adventure of Ancient Man: An Essay on Speculative Thought in the Ancient Near East* (Chicago: University of Chicago Press, 1977), 363—387 passim.

51 Julian Marias, *History of Philosophy* (New York: Dover, 1967), 4.

52 Frederick Coplestone, *A History of Philosophy*, 9 vols. (London: Search Press, 1946—75), 1: 14—16.

53 W. K. C. Guthrie, *A History of Greek Philosophy*, 6 vols. (Cambridge: Cambridge University Press, 1992) 1: 30—34 passim.

54 W. A. Percy III, *Pederasty and Pedagogy in Archaic Greece* (Urbana & Chicago: University of Illinois Press, 1996).

55 Ibid., 17.

56 Anthony Preus, "Greek Philosophy: Egyptian Origins," *Research Papers on the*

In contrast, the modern standard view, or "Aryan Model" as Martin Bernal terms it,[57] is the model according to which mainstream historiography of Greek philosophy and science has been written, taught and researched for the past 150 years or so. As exemplified in Colin Renfrew's ultra-hellenocentric "Model of Authochtonous Origins," this standard view emphasizes an almost exclusively authochtonous or indigenous contributing factors to the genesis and rise of classical Greek rationality, and is propagated through scholarly monographs, popular books[58] and in such standard works and textbooks on history of western philosophy as those by Coplestone,[59] Barnes,[60] Lloyd,[61] Marias,[62] and Guthrie.[63] Among the many "authochtonous" factors invoked are, as all students of Greek philosophy know after having these drilled into their consciousness from primary to tertiary education: inherent genius, sense of wonder, innate curiosity, favorable geographical conditions, uncentralised popular religion, uncentralised socio-political structures, the city-state structure, argumentative acumen, nascent democracy, and so on and so forth.

In reaction against the cognitive poverty of such excessive cultural insularity, revisionist scholars such as

Humanities and the Social Sciences, no. 3, Institute of Global Cultural Studies (Binghamton, NY: Binghamton University, 1992—93, 14—15).

57 *Black Athena*, 1: 2 ff.

58 For among the latest popularizing books celebrating the Greek (more-or-less) original invention of intellectual goods, see Ian F. McNeely and Lisa Wolverton, *Reinventing Knowledge: From Alexandria to the Internet* (New York: Norton, 2008).

59 Frederick Coplestone, *A History of Philosophy*, 9 vols. (London: Search Press, 1946—75), 1: 1 ff.

60 Jonathan Barnes, *Early Greek Philosophy* (London: Penguin Books, 1987).

61 G. E. R. Lloyd, *Early Greek Science: Thales to Aristotle* (New York: W. W. Norton, 1970).

62 Julian Marias, *History of Philosophy* (New York: Dover, 1967).

63 W. K. C. Guthrie, *A History of Greek Philosophy*, 1: 1 ff.

James,[64] Bernal,[65] Cline,[66] Gordon,[67] Burkert,[68] West[69] and many others have come out with a number of independent but interrelated and complementary approaches to classical Greek civilization collectively giving rise to what may be called the "revisionist viewpoint."[70] This is a generic term referring to a variety of alternative approaches to the study of the rise of classical Greek and later modern European civilization in world history, such as approaches from world-historical, world-systemic and world-civilizational analytical frameworks,[71] as well as from comparative socio-intellectual history, comparative history of thought, comparative history of religion, philosophy and science, reexamination of the Greek classical sources and reinterpretation of the (including discovery of new) archaeological evidence. All these more or less autonomous approaches converge on the general conclusion that both classical Hellenic and later Hellenistic, and modern European intellectual, cultural, political and economic hegemony in ancient and modern history respectively can only be adequately accounted for in terms of a dynamic combination of autochtonous contributory factors and cross-continental influences coming from far reaching developments in neighboring civilizations, and hence, explanations in terms of some internal Greek

64 George G. M. James, *Stolen Legacy: Greek Philosophy is Stolen Egyptian Philosophy* (Trenton, NJ: Africa World Press, 1992). The title of the book is deliberately provocative but the fact remains that James got his substantial facts right.

65 Martin Bernal, *Black Athena*, 3 vols.

66 Eric Cline, *Sailing the Wine-Dark Sea: International Trade and the Late Bronze Age Aegean* (Oxford: Tempvs Reparatvm, 1994).

67 Cyrus Gordon, *Before the Bible: The Common Background of Greek and Hebrew Civilizations* (New York: Harper & Row, 1962).

68 Walter Burkert, *The Orientalizing Revolution: Near Eastern Influence on Greek Culture in the Early Archaic Age* (London: Harvard University Press, 1992).

69 M. L. West, *Early Greek Philosophy and the Orient* (Oxford: Oxford University Press, 1971).

70 Martin Bernal calls it the "Revised Ancient Model," since it affirms what the ancient Greeks themselves have said in regard to the origins of their philosophy and science; see his *Black Athena*, 1: 2 ff.

71 A. G. Frank and B. K. Gills, *The World System: Five Hundred Years or Five Thousand?* (London: Routledeg, 1993); S. K. Sanderson, ed., *Civilizations and World Systems: Studying World Historical Change* (London: Sage, 1995); Michael Rowlands, *et al*., eds., *Centre and Periphery in the Ancient World* (Cambridge: Cambridge University Press, 1990);

or European "miracle," "genius," or "propensity," are effectively know-nothing verbiage serving only to prop up a rickety framework.

The Classical Greek View

But what about the way the Greeks themselves view the genesis of their own elaborate intellectual edifice? It turns out that they were quite unequivocally candid in admitting their admiration for, and indebtedness to, the Egyptians, the Jews and the Babylonians for their civilizational renaissance. Aristotle refers to Egypt as the cradle of mathematics[72] and even expresses appreciation for their political institutions[73] ; Hippolytus writes of Solon transmitting to the Greeks from Egypt philosophical and theological learning;[74] Herodotus writes of the Phoenicians introducing into Greece the art of writing;[75] Megathenes (ca. 350—290 BCE) discovers that all the doctrines of the early Greek sages about nature were already known to the Indian Brahmans and the Jews; and so on and so forth. Their writings are also replete with accounts of their intellectual sojourns abroad in the company of the sages of Egypt and the East, hence giving much classical testimonial credence to Martin Bernal's notion of "Afroasiatic roots" of Classical civilization.[76]

Thales (ca. 624—546 BCE), Solon (fl. ca. 600 BCE), Pythagoras (fl. ca. 530 BCE), Democritus of Abdera (ca. 460—360 BCE); Plato (ca. 429—347 BCE), Eudoxus of Cnidus (ca. 390—ca. 340 BCE), and many other Greek intellectual personalities, including Aristotle (384—322 BCE), are all reported in the classical sources to have visited Egypt, or

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72 *Metaphysics*, A I. 981b 23.

73 *Politics*, 7.10, trans. Ernest Barker in *The Politics of Aristotle* (Oxford: Oxford University Press, 1958), 304.

74 Hippolytus, *Refutation of All Heresies*, translated by Catherine Osborne in her *Rethinking Early Greek Philosophy: Hippolytus of Rome and the Presocratics* (London: Duckworth, 1987), 261.

75 Herodotus, *The Histories*, 361 (V. 58), trans. Aubrey de Selincourt (London: Penguin Books, 1972), 406.

76 Martin Bernal, *Black Athena: The Afroasiatic Roots of Classical Civilization*, 3 vols. (New Brunswick, NJ: Rutgers University Press, 1987—2006).

Asia Minor, or Babylonia, or even India and beyond, and to have sat at the feet of the scholar-priests of those countries, or at least to have engaged in scholarly discussions with them. Pythagoras is reported to have been initiated into ancient Egyptian literature by the high-priest Sonchis, and learned the Egyptian language and hieroglyphics; Plato is reported by Plutarch (ca. CE 50—120) to have received instruction from the Egyptian priest, Conuphis;[77] Aristotle's pupil, Clearchus of Soli (fl. ca. 300 BCE) writes of his master's admiration for a Jewish sage he met during his scholarly sojourn in Assos, in Asia Minor[78] ; and so and so forth.

Conclusion

To sum up, classical Muslim historians of science do not view Greek philosophy and science as a privileged and unique phenomenon in the "intellectual adventure of mankind"[79] which arose in splendid socio-cultural isolation from neighboring, more ancient "high" civilizations. On the contrary, they diligently point out the scientific links among Chaldea, Egypt, Persia and Greece without in any way diminishing the later, distinctive contributions of the

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77 On Pythagoras' travels, see K. S. Guthrie, *The Pythagorean Sourcebook and Library: An Anthology of Ancient Writing which Relate to Pythagoras and Pythagorean Philosophy* (Grand Rapids, MI: Phanes Press, 1987), 12—13, 20, 60—62, 125. For Solon in Egypt, see Matthew Dillon and Lynda Garland, *Ancient Greece: Social and Historical Documents from Archaic Times to the Death of Socrates* (c. 800—399 BC) (London: Routledge, 1994), 68, 83—85. For Democritus in Egypt and Babylonia, see the survey of the relevant classical sources in Anthony Preus, *Greek Philosophy: Egyptian Origins*, Research Papers on the Humanities and the Human Sciences, no. 3 (Binghamton, NY: Institute of Global Cultural Studies, Binghamton University, 1992—93); see also Thomas Heath, *A History of Greek Mathematics*, 2 vols. (Oxford: Clarendon Press, 1921), 1: 176--177. For Thales in Egypt, Phoenicia and Babylonia, see Thomas Heath, *History of Greek Mathematics*, 1: 4—5. On Plato's travels, see Alice Swift Riginos, *Platonica: The Anecdotes Concerning the Life and Writings of Plato* (Leiden: Brill, 1976). For Eudoxos in Egypt, see also Heath, *History of Greek Mathematics*, 1: 322—323.

78 Elias J. Bickerman, *The Jews in the Greek Age* (Cambridge: MA: Harvard U. Press, 1988), 15.

79 Henri Frankfort, *et al., The Intellectual Adventure of Ancient Man: An Essay on Speculative Thought in the Ancient Near East* (Chicago: University of Chicago Press, 1977).

remarkable Greeks they so admire, willingly or grudgingly. And moreover, their view reasonates quite well with the views of the ancient Greeks themselves and with modern revisionist, post-eurocentric scholarship on the subject.[80] Due to the formidable array of evidence it can marshal and have in fact marshaled through its multi-pronged investigative approaches, the revisionist view that the intellectuality and rationality of the Greeks were thoroughly *embedded* within the larger and older cosmopolitan cultural, scientific and technological milieu of the Levant and even beyond (e.g., Ethiopia, Persia and India) is fast becoming (if it has not already become) the new scholarly consensus in Classical studies.

The questions they have all asked, and which we today continue to ask, are precisely the ones that guide the central controlling theme of this brief inquiry into the genesis of Greek philosophico-scientific thought: Who exactly are the remarkable Greek scientists and philosophers? Where did they study and who were their teachers? What were the socio-cultural contexts in which their intellectual endeavors were embedded? How did science and natural philosophy begin and flourish in Greece and how did it decline and why? How did ancient Egypto-Mesopotamian philosophy and science flow into Greece and brought about what Western civilization now refers to, with almost religious reverence, as the (or rather, *their*) Classical Age? How did Greek science later on flow into Islam and took on new forms and contents in the context of a new and radically different, systemic and self-confident universal worldview? Specifically, all these and similar questions can be combined and formally rearticulated thus:

> How did it come about that the classical Greek thinkers within the relatively very short period of

[80] For a detailed list of Egyptian educated Greeks, see the Greek historian, Diodorus Siculus (fl. ca. 60--30 BCE), *Bibliotheca Historica* (Library of History), bk. 1. 69. 2—5, 96. 1—98. 10; trans. C. H. Oldfather, Loeb Classical Library (Cambridge, MA: Harvard U. Press, 1984), 1: 239, 327—341.

only 263 years[81] between Thales, the so-called "first philosopher-scientist,"[82] and Aristotle, the epitome and consummation of Greek rationality, managed to erect a formidably ramified intellectual edifice that has since never failed to engage the devote attention of the best minds of Hellenistic, Roman, Byzantine, Islamic, Latin-Christian and Modern-Western civilizations?

I believe that all thinking Muslims should take part in this inquiry according to their respective capacity, for that, more than anything else, will cause them to look at science and philosophy in a new, more critical and more creative light, and result in their cognitive emancipation (*al-taḥrīr al-'aqlī*) from the intellecto-cultural blinkers of outdated helleno-eurocentrism,[83] and by extension, from modern, corporatized science and technology, which is now causing so much *systemic violence* to both nature and culture.[84] For our coming to terms with the origins of science and philosophy is among the prerequisites for an operative Islamization of contemporary knowledge[85] and hence for

[81] According to the chronological table provided in the widely used university textbook by G. E. R. Lloyd, *Early Greek Science: Thales to Aristotle* (New York: Norton, 1970), Thales and Aristotle died in 585 BCE and 322 BCE respectively, hence a relatively short period of 263 years separate between the two during which the Greeks went from precious little science to speak of to effectively creating practically all the philosophical and natural sciences of the ancient world.

[82] G. E. R. Lloyd, *Early Greek Science*, 8.

[83] Heinrich von Staden, "Affinities and Elisions: Helen and Hellenocentricism," in *Isis* 83 (1993), 578—595.

[84] Ashis Nandy, ed., *Science and Violence: A Requiem for Modernity* (Delhi: Oxford U. Press, 1990). An alternative way of doing science is elaborated in some detail in Adi Setia, "Green is Graceful: Reorientating Science & Technology for Soil, Soul & Society," paper presented at the *International Conference on Muslims and the Frontiers of Knowledge in the 21st Century: Issues, Prospects and Challenges*, organized in Kuala Lumpur by the Institute for Islamic Understanding Malaysia (IKIM), July 28—29, 2009.

[85] Syed Muhammad Naquib al-Attas, *Islam and Secularism* (Kuala Lumpur: ISTAC, 1993), especially Chapter V on "The Dewesternization of Knowledge," 133—168; and Wan Mohd Nor Wan Daud, Chapter Six and Chapter Seven on, respectively, "Islamization of Contemporary Knowledge: Theoretical Dimensions and Practical Contributions," and "Responses to Islamization

the revival of Islamic science and philosophy in the present age as one of its integral components.[86] To realize this inquiry as a *systemic* research program, it is imperative that some Muslims should train as classicists and as historians of the many pre-Greek, ancient civilizations of the Levant,[87] and work with their non-Muslim counterparts in the West to trace the true sources of Classical thought, especially the immense and varied Aristotelian corpus,[88] and hence revive, refine and further advance in contemporary terms the sophisticated lingua-scientific research project initiated by al-Fārābī in his remarkable *Kitāb al-Ḥurūf*.

of Contemporary Knowledge," in his *The Education Philosophy and Practice of Syed Muhammad Naquib al-Attas: An Exposition of the Original Concept of Islamization* (Kuala Lumpur: ISTAC, 1998), 291—370, and 371—422.

86 Adi Setia, "Three Meanings of Islamic Science: Toward Operationalizing Islamization of Science," in *Islam & Science* (Summer, 2007), 23—52.

87 The importance of this point is borne out in the case of the venerable discipline of Egyptology. If it were not for the groundbreaking work of the Egyptian Egyptologist, Okasha El Daly, the world of scholarship would have continued to remain in the dark about the actual attitude and contribution of classical Muslim scholars to the understanding of the civilizational heritage of Ancient Egypt. See Okasha El Daly, *Egyptology, The Missing Millenium: Ancient Egypt in Medieval Arabic Writings* (London: UCL Press, 2005); see also relevant, informative articles on this important topic at the muslimheritage.com websites, http://www.muslimheritage.com/: "Arabic Study of Ancient Egypt" and http://www.muslimheritage.com/: "Deciphering Egyptian Hieroglyphs in Muslim Heritage".

88 There are in fact many problems with ascribing the vast, diversified Aristotelian corpus to the work of only one man, Aristotle; on this, see, for instance, Felix Grayeff, *Aristotle and His School: An Inquiry into the History of the Peripatos with a Commentary on Metaphysics Z, H, A & Q* (London: Duckworth, 1974).