

- 1 Philip Hitti, *History of the Arabs*, (10th Edition, 1974), p. 10.
- 2 Geoffrey W. Bromiley, *The International Standard Bible Encyclopedia: E-J*, (1995), p. 33.
- 3 Edward Lipinski, *Semitic Languages: Outline of a Comparative Grammar*, (Peeters Publishers 2001), p. 295.
- 4 *Lisan al-Arab* = خمس
- 5 ويقال: بفلان ثثنى الخناصرُ أي ثُبُتًا به إذا ذُكِرَ أشكالكهُ. (خنصر).
- 6 فإن عُدَّ من مَجْدٍ قديمٍ لِمَعْتَرٍ، فِقْوَمِي بِهِم ثُنْتِي هُنَاكَ الْأَصَابِعِ. (ثني)
- 7 وقيل للإصْنَعِ إِبْهَامٌ لِأَنَّهَا تُثْبِمُ الْكَفَّ أَيْ تُطَبِّقُ عَلَيْهَا. لِسَانُ الْعَرَبِ: بِهِم.
- 8 قال امرؤ القيس: وَأَقْلَبْتُهُنَّ عَلِيَاءَ جَرِيضًا، وَلَوْ أَدْرَكْتَهُ صَفْرَ الْوَطَابِ. وَهُوَ مِثْلُ مَعْنَاهُ أَنْ جَسْمَهُ خَلَا مِنْ رُوحِهِ أَيْ لَوْ أَدْرَكْتَهُ الْخَيْلُ لَقَتَلْتَهُ فَفَزَعَتْ، وَقِيلَ: مَعْنَاهُ أَنْ أَدْرَكْتَهُ قَتَلَ فَصَفَّرَتْ وَطَابَهُ الَّتِي كَانَ يَغْرِي مِنْهَا وَطَابَ لَيْبِهِ، وَهِيَ جَسْمُهُ مِنْ دَمِهِ إِذَا سَفِكَ. وَقَوْلُهُ فِي الْحَدِيثِ: لَا عَدْوَى وَلَا هَامَةَ وَلَا صَفْرًا؛ قَالَ أَبُو عبيد: فَسَّرَ الَّذِي رَوَى الْحَدِيثَ أَنَّ صَفْرًا نَوَابُ الْبَطْنِ. وَقَالَ أَبُو عبيد: 9 سمعت يونس سأل روية عن الصَّفْرِ، فَقَالَ: هِيَ حَيَّةٌ تَكُونُ فِي الْبَطْنِ تَصِيبُ الْمَاثِيَةَ وَالنَّاسَ، قَالَ: وَهِيَ أَعْدَى مِنَ الْجَرَبِ عِنْدَ الْعَرَبِ؛ قَالَ أَبُو عبيد: فَأَبْطَلُ النَّبِيِّ، صَلَّى اللَّهُ عَلَيْهِ وَسَلَّمَ، أَنَّهَا تَعْدِي. قَالَ: وَيَقَالُ إِنَّهَا تَشْتَدُّ عَلَى الْإِنْسَانِ وَتُوَدِّعُ إِذَا جَاعَ. (وَالصَّفْرَاءُ: الْجَرَادَةُ إِذَا خَلَّتْ مِنَ الْبَيْضِ).
- 10 Karl Menninger, *Number Words and Number Symbols*, 1992.
- 11 James Gilchrist, *Philosophic Etymology, or Rational Grammar*, (1816), pp. 24-25.
- 12 *The New York Times*, April 2, 1992.
- 13 Book III: 43: 4.
- 14 *ibid.*, Book XIX, 94-97.
- 15 Klaas Dijkstra, *Life and Loyalty: A Study in the Socio-Religious Culture of Syria and Mesopotamia in the Graeco-Roman Period Based on Epigraphical Evidence*, (Brill 1995), p. 298.
- 16 See G. A. Cooke *A textbook of North-Semitic Inscriptions* (Oxford, 1903), pp. 274, 279; Hitti, p. 74.
- 17 J. F. Matthews, *The Tax Law of Palmyra: Evidence for Economic History in a City of the Roman East*, *The Journal of Roman Studies*, Vol. 74, (1984), p. 157.
- 18 Robert K. Sherk, *The Roman Empire: Augustus to Hadrian*, (1988), p. 201.
- 19 Hildegard Temporini and Wolfgang Haase, *Aufstieg und Niedergang der römischen Welt* (Rise and Fall of the Roman World), (Walter de Gruyter 1978), p. 643.
- 20 Arabic *Jarha'* جرحاء, an ancient city some 50 miles northeast of al-Hasa in the eastern province of Saudi Arabia, and may have been the original home of the Canaanites.
- 21 Paul Wheatley, *The Places Where Men Pray Together: Cities in Islamic Lands*, (University of Chicago Press 2001), p. 11.
- 22 C. H. M. Versteegh, Kees Versteegh, *The Arabic Language*, (Edinburgh University Press 2001), p. 25.
- 23 According to Masudi, when Othman was murdered he was reported to have left with his treasurer "150,000 Dinar and a 1000,000 Dirham in cash, property valued at Dinar 100,000 and a large number of camels and horses." *Moroj al-Dhahab*, Vol. II, p. 305.
- 24 Karl Koch in *A Popular History of the Catholic Church* has this to say about those early Muslim days in Andalusia, "As the Muslims marched to the north, panic spread in Gaul. Since Clovis's death, the sons and grandsons of Clovis had divided and subdivided the Frankish kingdom until there was virtually no central government left. Lawlessness coupled with relentless poverty made Gaul a hard place in which to live, and it was vulnerable to a huge force like the Muslims. However, in 732 Charles Martel, a kind of prime minister of Gaul called a "mayor of the palace," with his army met and defeated the invading Muslim army at the city of Tours, near Paris. The Muslims retreated over the mountains back into Spain. During the next few years, Martel had to fight the Muslims several more times, but he lived up to his name—Martel means "hammer." His victories prevented Islam from spreading over Europe." (Saint Mary's Press, 1997), pp.109-110.
- 25 Walter Emil Kaegi, *Byzantium and the Early Islamic Conquests*, (1995), p. 80.
- 26 Al -Tabari, Abu Ja'far Mohammad bin Jarir, *History of Nations and Kings* (*Tarikh al-Umam wa-al-Mulook*), (Ezzeddeen Printing and Publishing, Beirut, 1985), Vol. IV, p. 308.
- 27 Ronald Findlay and Kevin H. O'Rourke, *Power and Plenty: Trade, War, and the World Economy in the Second Millennium*, (2007), p. 50.
- 28 Maurice Lombard, *The Golden Age of Islam*, (1975), p. 10.

29 As expected, exchange rates fluctuated according to income and availability of Dirhams. For several centuries, the Dinar was as high as 15 Dirhams and as low as 45. Al-Maqrizi (775-845 AH/1373-1441) provided us with an interesting glimpse of prices and living standards of his time. He says that a middle class man may have a monthly income of 300 Dirhams from which he would spend a maximum of ten Dirhams a day. Of these, he would buy three pounds of lamb meat for two Dirhams, spices for the meat for two Dirhams and four more Dirhams to buy other items sufficient to feed his children, family and those who serve him. *Ighathat al-Ummah bi-Kashf al-Ghamma*, pp. 83-87

30 *The Muqaddimah*, p. 216.

31 *Lisan al-Arab* = 'Ashr (عشر).

32 John Lierman, *The New Testament Moses*, p. 210.

33 Cited by Hitti, p. 8, from George A. Barton, *Semitic and Hamitic Origins* (Philadelphia 1934), pp. 85-7; Ignace J. Gelb, *Hurrians and Subarians* (Chicago 1944), pp. 69-70.

34 Dennis Bratcher argues in *The Old Testament and the Israelite Perception of the Physical World* (cresourcei.org/langcaan.html) that the Israelites not only lived in the midst of Canaanite culture, a certain number of them were originally Canaanites or were native to the environment of Palestine. So it seems likely, and there is little in the biblical traditions which would dispute the fact that the Israelites moved into this cultural milieu and drew from its stock of metaphors, language symbols, customs, and, to some degree, its world view.

35 PBS *Interview with Dr. Juris Zarins*, September 1996.

36 Calvin R. Schlabach, *The Pishon River—Found!* *Focusmagazine.org*.

37 Juris Zarins, *Early Pastoral Nomadism and the Settlement of Lower Mesopotamia* (Bulletin of the American Schools of Oriental Research), No. 280 (Nov., 1990), pp. 31-65

38 Herodotus, *The History*, Book V, TERPSICHORE.

39 James P. Allen, *Middle Egyptian: An Introduction to the Language and Culture of Hieroglyphs*, (1999), p. 1.

40 R. Dussaud, "Inscription nabatéo-arabe d'en-Namara," *Revue archéologique*, 2 (190), pp. 409-421. The research was also published in 1903 in *Mission scientifique dans les régions désertiques de la Syrie Moyenne* (Paris 1903), pp. 314-22.

41 Ramzi Baalbaki, *Arab and Semitic Writing*, pp.126-143.

42 Vol., 8, pp. 243-246. See also the footnote in Klaas Dijkstra's *Life and Loyalty: A Study in the Socio-Religious Culture of Syria and Mesopotamia in the Graeco-Roman Period Based on Epigraphical Evidence*, (Brill 1995), p. 39, quoting (Lidzbarski 1908:34).

43 تي (هذي، هذه؟) نفس مر القيس بر عمرو ملك العرب لقبه ذو اسد ومنحج

وملك الاسديين ويهر وملوكهم وهر ب منحج عكدي وج

يزجى في رنج نجران منبنة شمر وملك معدو ونبلأزم

إلسوب ووكلم فرسو لروم فلم يبلغ ملك مبلغه

عكدي هلك سنة 223 يوم 7 يكسلول بالسعد ذو ولوه

44 J. A. Bellamy, *The New Reading Of The Namarah Inscription*, (Journal Of The American Oriental Society), 1985, Vol. 105, pp. 31-48.

45 No god in this name appear to exist in the list provided by Dr. Yahya al-Shami *Al-Shirk al-Jahli*, (Dar al-Fikr, Beirut, 1986). However, *Obodas* is the Greek corruption of 'Obaidath or 'Ubaydah', a well-known Arabic name. The reference here may be to Nabataean King Obodas III who ruled between 28-9 BC, (See, Hitti, p. 68). *Obaid*, from 'Ubaydah, is diminutive of 'abd which means "slave", an unlikely name for a God.

46 J. A. Bellamy, *Arabic Verses From The First/Second Century: The Inscription Of 'En 'Avdat*, (Journal Of Semitic Studies), 1990, Vol. 35, pp. 73-79.

47 Abu al-'Abbas Ahmad al-Qalqashandi, *Kitab Sobh al-'A'sha*, 1914, Vol. III, (Dar al-Kutub al-Khidiwiyyah, Cairo), p. 15.

48 Ed. by G.J. Juynboll, (Leyden, 1855), Vol. II, p. 11.

49 For the early history of the Kufic style, several references were quoted from Hitti's *History of the Arabs*.

50 Taufik Ibrahim K., *Classical Arab-Islamic Culture*, Chapter viii. In *Values in Islamic Culture and the Experience of History*, Ed., Nur Kirabaeve, Yuriy Pochta.

51 Philip Hitti, *History of Syria: Including Lebanon And Palestine*, p. 645.

52 Salah Zaimche, *Baghdad*, Foundation for Science, Technology and Civilisation, (June 2005).

53 Several important sections in ibn Khaldun's al-Muqaddimah are not translated and almost every reference by ibn Khaldun to Andalusia was deliberately changed to "Spain", a political entity that did not exist in ibn Khaldun's time. As Christian kingdoms were in control of large parts of Andalusia at the time, ibn Khaldun's text becomes confusing for the general reader who may not be aware that ibn Khaldun was talking about Muslim Andalusia, not Christian Castille. On page 66, we find the following misleading translation: "The Spaniards are found to have a sharpness of intellect, a nimbleness of body, and receptivity for instructions such as no one else has." The words ibn Khaldun uses are "Ahl al-Andalus", the *people of Andalusia* (Arabic text p. 64). On page 316, the entire Andalusian culture is made "Spanish". Ibn Khaldun is probably the first Muslim scholar to notice the beginning of the *Renaissance* in "the land of Rome and those to the north" (Ar. p. 302). Yet this historical reference is made vague by the unnecessary addition in the translation of "northern shore of the country of European Christians." (p. 375).

54 Al-Anbar is the largest province in Iraq encompassing much of the country's western territory, and bordered by Syria, Jordan and Saudi Arabia. Al-Anbar (Ar. for granaries), was the primary entrepôt on the western borders of the Lakhmid Kingdom.

55 This and the other examples to follow are extracted from Bayard Dodge's translation of *al-Fihrist*. The samples may vary from one manuscript to another depending on the copyist.

56 *Fihrist*, Chapter I. See also Bayard Dodge's translation, P. 22.

57 David A. King, *The Ciphers of the Monks: A Forgotten Number-notation of the Middle Ages*, (Franz Steiner Verlag 2001), P. 295.

58 Edward Lipinski, Karel van Lerberghe, Antoon Schoors, *Immigration and Emigration Within the Ancient Near East*, (Peeters Publishers 1995), pp. 192-193.

59 *The Nabataeans: Builders of Petra*. (nabataea.net)

60 See, for example, *Al-Arqaq al-Arabiah*, ("Arabic Numerals") by Dr. Abdul Latif Jassem Kanu, (Bahrain, 1977). The term he used for the western-style Arabic numerals is "Arabi Maghribi Ghoobar" ("Maghribi ghoobar numerals").

أن رسول حماد بن سلمة عن أيوب عن نافع عن ابن عمر 912: وحدنا عبد بن حميد حدثنا يونس بن محمد حدثنا وضع يده اليسرى على ركبته اليسرى ووضع يده اليمنى على ركبته اليمنى وعقد ثلاثة الله صلى الله عليه وسلم كان إذا قعد في التشهد وخمسين وأشار باليسارية.

الله حدثنا عبد الواحد بن زياد حدثنا عثمان بن حكيم حدثنا عامر بن عبد حدثنا محمد بن عبد الرحيم البزاز حدثنا عفان وفرش صلى الله عليه وسلم إذا قعد في الصلاة جعل قدمه اليسرى تحت فخذة اليمنى وساقه كان رسول الله بن الزبير عن أبيه قال اليمنى وأشار بأصبعه وأرانا عبد الواحد وأشار قدمه اليمنى ووضع يده اليسرى ووضع يده اليمنى على فخذة باليسارية.

لأنظرون إلى صلاة رسول كليب عن أبيه عن وائل بن حجر قال قلت حدثنا مسدد حدثنا بشر بن المفضل عن عاصم بن 63 أخذ صلى الله عليه وسلم فاستقبل القبلة فكير فرقع يديه حتى حادثنا بأذنيه ثم أمه صلى الله عليه وسلم كيف يصلي فقام رسول الله اليسرى ووضع يده اليسرى على فخذة اليسرى وحد مرفقه شماله بيمينه فلما أراد أن يركع رفعهما مثل ذلك قال ثم جلس فافتش رجليه ثنتين وحلق حلقة ورأيته يقول هكذا وحلق بشر الإبهام والوسطى وأشار باليسارية. الأيمن على فخذة اليمنى وقبض والعشرات والمئين والألف ، أما الأحاد اعلم أن للعرب طريقة معروفة في عقود الحساب توطأوا عليها وهي أنواع من الأحاد 64 الوسطى معها كذلك ، وللأربعة معها كذلك ، وللثلاثة عقد البصر باطن الكف ، وللاثنين عقد الفلواحد عقد الخنصر إلى أقرب ما يليه من الأنامل ، وللسبعة بسط الخنصر إلى أصل وحل جميع البصر معها دون الوسطى ، وللسنة عقد البصر حل الخنصر ، وللخمس حل العشرات فلها الإبهام واليسارية فوقها كذلك ، وللتسعة بسط الوسطى فوقها كذلك. وأما البصر الإبهام مما يلي الكف ، وللتمانية بسط والعشرين إدخال الإبهام في السبابة والوسطى ، وللثلاثين عقد رأس السبابة على ، فللعشرة الأولى عقد رأس الإبهام على طرف السبابة الإبهام إلى أصلها ، وللخمسين عطف الإبهام عكس العشرة ، وللأربعين تركيب الإبهام على العقد الأوسط من السبابة وعطف رأس الإبهام عكس الأربعين ، وللستين لقاء رأس الإبهام على العقد الأوسط من السبابة الإبهام إلى أصلها وللستين تركيب السبابة على ظهر على جنب السبابة من ناحية الإبهام ، وللستين ورد طرف السبابة إلى الإبهام ، وللثمانين رد طرف السبابة إلى أصلها وبسط الإبهام قال اليسرى. بالإبهام. وأما المئين فكالأحاد إلى تسعمائة في اليد اليسرى ، والألف كالعشرات في عطف السبابة إلى أصل الإبهام وضمها كالنذري: وأخرجه النسائي ابن ماجه بكنيته

قالوا حدثنا محمد بن بشر فقال سمعت هاتين بن عثمان عن أمه حدثنا موسى بن حزام وعبد بن حميد وغير واحد 65 والتهايل قال لنا رسول الله صلى الله عليه وسلم عليكن بالمتبيح بنت ياسر وكانت من المهاجرات قالت حمضة فتسعين الرحمة قال هذا حديث إنما نعرفه من حديث هاتين بن والتقيديس واعقدن بالأنامل فإثنين مسنولات مستطقات ولا تغفلن عثمان وقد رواه محمد بن ربيعة عن هاتين بن عثمان.

أي بعقدها أو برؤوسها يقال عقد الشيء بالأنامل عده. قال الطيبي : حرضهن صلى الله عليه وسلم على أن يحصين تلك الكلمات 66 بأناملهن ليحط عنها بذلك ما اجترحت من الذنوب ويدل على أنهن كن يعرفن عقد الحساب انتهى. والأنامل جمع أنملة بنتلث الميم والهمز تسع لغات التي فيها الظفر كذا في القاموس والظاهر أن يراد بها الأصابع من باب إطلاق البعض وإرادة الكل عكس ما ورد في قوله تعالى { يجعلون أصابعهم في آذانهم } للمبالغة.

67 Abu Bakr 'Abd ul-Qahir ibn 'Abdul-Rahman al-Jurjani, *Asrar al-Balagha*, pp. 42-43.

68 *Muqaddimah*, p. 217.

69 Jonathan M. Bloom is the Norma Jean Calderwood University Professor of Islamic and Asian Art at Boston College, an appointment he shares with his wife, Sheila Blair. He is co-author, with Blair, of *Islam: A Thousand Years of Faith and Power (2000)*, which was the companion book to the PBS documentary series *Islam: Empire of Faith*. These extracts are drawn from his latest book, *Paper before Print: The History and Impact of Paper in the Islamic World (2001)*, published by Yale University Press.

70 Tash Kabri Zadah, *Muftah as-Sa'adah wa Miṣbah as-Siyadah*, Vol. I, p. 372. Hajji Khalifa reproduces most of Tash Kabri's text about the Hawa'i arithmetic. See *Kashf al-Zoonon 'an Asami al-Kutub wa-l-Funoon*, (Beirut, Lebanon), Vol. I, pp. 664-665.

71 Ibn al-Samh's *Kitab al-'Amal bi'l-asturlab* is the most complete tract written in the Iberian peninsula during the Middle Ages (129 chapters on the use of the instrument). A new instrument conceived in al-Andalus for the first time and later developed in Latin Europe, the equatorium, is another of Ibn al-Samh's great contributions to astronomy. Indeed, his treatise on this instrument is the first-known text of this type. See Thomas F. Glick, Steven John Livesey, Faith Wallis, *Medieval Science, Technology, and Medicine: An Encyclopedia*, (Routledge 2005), p. 241.

72 Un-numbered folio in *al-Wasilla* manuscript in Dr. Khadr Abbas Mohammad al-Manshadawi, *Tarikh 'Im al-Riyadiat 'ind al-Arab* (the Arabs' History of Mathematics), (Qan Younes [Libya] University Press, 1999), p. 192.

73 Abu al-Hassan Ahmad ibn Ibrahim ibn Uqlidisi. The book is believed to have been written in Damascus in the year 341 AH/ 952/3 AD. A translation by A. S. S'aidan was published in 1978.

74 Charles Vallancey, *Collectanea de Rebus Hibernicis*, (1786), p. 574.

قال: ومما يدل على صحة هذه اللغة ما رويناه عن النبي، صلى الله عليه وسلم، أنه قال: الشهر هكذا وهكذا، وخنس إصبعه في 75 الثالثة أي قبضتها يعلمهم أن الشهر يكون تسعا وعشرين.

76 Ibn al-Yasamin, *Talqih al-Afkar fi al-'Amal bi Rasm al-Ghoobar*, p. 2.

77 Mohammad bin Ahmad bin Yusuf al-Katib al-Khwarizmi, *Mafatih al-Oloum*, Chapter 5.

78 *Kashf al-Zoonon*, Vol. I, p. 663.

قال البيهقي : يحتمل أن يكون مراده بالتحريك الإشارة لا تكريير تحريكها ، حتى لا يعارض حديث ابن الزبير . وموضع الإشارة 79 عند قوله : لا إله إلا الله ، لما رواه البيهقي من قول النبي صلى الله عليه وسلم : ويؤتى بالإشارة التوحيد والإخلاص فيه ؛ فيكون جامعا في التوحيد بين الفعل والقول والاعتقاد، ولذلك { نهى النبي صلى الله عليه وسلم عن الإشارة بالأصبعين وقال : أحد أحد لمن رآه يشير بأصبعيه}.

80 "numerals and numeral systems." *Encyclopædia Britannica*. 2008.

81 In *Lisan al-Arab* = 'ashr (عشر).

82 Sir John Bowring, *The Decimal System in Numbers, Coins and Accounts*, (1854), p.21.

83 *Lisan al-Arab*, خط الزاجر

- 84 *Lisan al-Arab*, عشية مالي حيلة غير أنني، بلقط الحصى والخط في التراب مولع
- 85 Out of an estimated world population total in 800 AD of 220 million. Colin McEvedy and Richard Jones, *Atlas of World Population History*, (London, 1974).
- 86 *The Blackwell Encyclopedia of Writing Systems*, (Blackwell Publishing 1996), p. 469.
- 87 Believed to have been originally Semitic due to the resemblance of several letters to their Semitic counterparts. These include, *alef, dha, tha, la and ra*.
- 88 A government information release at presidencymaldives.gov.mv
- 89 *ibid*.
- 90 Antoine-Yves Goguet, *The Origin of Laws, Arts, and Sciences, and their Progress among the most Ancient Nations*, (3 volumes), (Edinburgh 1775), Vol. I., p. 221. The French title of Goguet's volumes is *De l'origine des loix, des arts, et des sciences, et de leurs progrès chez les anciens peuples*.
- 91 James Gilchrist, *Philosophic Etymology, Or Rational Grammar*, (1816), p. 24
- 92 John D. Barrow, *Pi in the Sky: Counting, Thinking and Being*, (Penguin 1992), p. 26.
- 93 Vol. V. p. 49.
- 94 *Proceedings of the British Philological Society*, Vol. 3, (Oxford 1848), p. 221.
- 95 Lipinski, p. 296.
- 96 <http://www.sciencedaily.com/releases/2000/01/000110071130.htm>
- 97 <http://www.springerlink.com/content/4jqwg8vytk5n5tf/>
- 98 I. Diester, A. Nieder, *Semantic Associations between Signs and Numerical Categories in the Prefrontal Cortex*, (Oct. 30, 2007), PLoS Biology Vol. 5, No. 11.
- 99 "More recently, a writer after collecting what he calls *The Symbols of Nations* has found upon the portico of a large temple at Dendera a translation of the hundredth psalm of David, composed to invite all people to enter into the house of the Lord. So with perhaps still greater extravagance, it has been pretended that hieroglyphics, considered as simple letters, expressed Hebrew words: as if it was not known that the ancient Egyptians had a language of their own, which exists for the most part now in the idiom and books of the Coptic." J. G. H. Greppo, *Hieroglyphic System of M. Champollion*, (1842), p. 14.
- 100 George Robins Gliddon, *Ancient Egypt: A Series of Chapters on Early Egyptian History, Archaeology*, (1848), p.7.
- 101 Martin Bernal, *Black Athena*, (1987), p. 253.
- 102 Edward Said, *Orientalism*, (2003), p. 137.
- 103 In Arabic the word is *labo'* لبوء, female *labw'a*, (لبوءة). *Labo'* was used as a name for men in the past. For an unknown reason, *Lisan al-Arab* reports that the word was "mortalised" and is hardly used anymore. However, *labw'a* survived and is used frequently.
- 104 Mukhopadhyaya, Satakari, *Preface to A Grammar of the Classical Arabic Language* by Mortimer Sloper Howell, trans. 4 Vols. Delhi, India: Gian Publishing House, 1986, pp. 3-4.
- 105 James Henry Breasted, *A History of Egypt from the Earliest time to the Persian Conquest*, 1905, (Reprint, 2003), pp.6-7.
- 106 Gliddon, p. 52.
- 107 Sir Alan Henderson Gardner, *Egypt of the Pharaohs: an Introduction*, (Oxford University Press, 1964), p. 19.
- 108 Jeffrey Alford and Naomi Duguid, *On the Flatbread Trail*, Saudi Aramco World, September/October, 1995.
- 109 E. A. Wallis Budge, *The Mummy: A Handbook of Egyptian Funerary Archaeology*, p. 155.
- 110 en.wikivisual.com/index.php/Egyptian_language
- 111 Mark Depauw, *The Demotic Letter. A Study of Epistolographic Scribal Traditions against their intra- and intercultural Background*.
- 112 Otto F. Ego, *The Story of the Alphabet*, (1921), p. 3.
- 113 "The Hebrews copied Phoenician letters as a whole and retained the original names with only slight variations. They did change the shapes because a different writing instrument was employed. According to legend, Jehovah gave the letters to Moses; hence all the left curves in Hebrew letter form turn upward-as symbols of a finger pointing heavenward" (*ibid.*, p. 18).
- 114 The stem *fata/ha* is "to open", hence *fat/ha*, an opening [by the mouth].
- 115 David Edward Aune, *The Westminster Dictionary of New Testament and Early Christian Literature and Rhetoric*, (2003), p. 208.
- 116 John Huehnergard, *Proto-Semitic Language and Culture, The American Heritage Dictionary of the English Language*, Fourth Edition, 2000.
- 117 وقال شاعرهم: وَلِسُوْطِهِ زَجَلٌ، إِذَا أَمْسَتْهُ جَزْرُ الرِّيحِ يَجْرِيْنِهَا المَطْحُونُ (لسان العرب – جرن).
- 118 See: Geoffrey Bromiley, *The International Standard Bible Encyclopedia: E-J*, (1995), p. 33.
- 119 أحد: في أسماء الله تعالى: الأحد وهو الفرد الذي لم يزل وحده ولم يكن معه آخر، وهو اسم بني لنقي ما يذكر معه من العدد، الواحد وهو أول العدد، تقول أحد واثنان وأحد تقول: ما جاءني أحد، والهمزة بدل من الواو وأصله وحَدٌ لأنه من الوَحْدَةِ. الأحد: بمعنى عشر وإحدى عشرة. وأما قوله تعالى: قل هو الله أحد؛ فهو بدل من الله لأن التكررة قد تبدل من المعرفة كما قال الله تعالى: لنسفن بالناصية ناصية. وفي الحديث: أنه قال لرجل أشار بسبابتيه في التشهد: أَحَدٌ أَحَدٌ. وفي حديث سعد في الدعاء: أنه قال لسعد وهو يشير في دعائه بأصبعين: أَحَدٌ أَحَدٌ أي أشر بأصبع واحدة لأن الذي تدعو إليه واحد وهو الله تعالى.
- صبع: الأصبعُ: واحدة الأصابع، تنكر وتؤنث، وفيه لغات: الإصْبَعُ والأصْبَعُ، بكسر الهمزة وضمها والياء مفتوحة، والأصْبَعُ وفي الحديث: قلب المؤمن بين إصْبَعَيْنِ من والأصْبَعُ والأصْبَعُ مثال اضْرِبْ، والأصْبَعُ: بضم الهمزة والياء، والإصْبَعُ نادرٌ أصابع الله يُقْبَلُ كيف يشاء، وفي بعض الروايات: قلب العباد بين إصْبَعَيْنِ؛ معناهُ أن قلب القلوب بين حسن آثاره وصنْعه تبارك وتعالى. قال ابن الأثير: الإصْبَعُ من صفات الأجسام؛ تعالى الله عن ذلك وتقدس، وإطلاقها مجاز كإطلاق اليد واليمين واليسار والسمع، وهو جار مجرى التمثيل والكنية عن سرعة قلب القلوب، وإن ذلك أمر معقود بمشيئة الله سبحانه وتعالى، وتخصيص ذكر الأصابع كناية عن أجزاء القدرة والبطش لأن ذلك باليد والأصابع أجزاءها.
- 121 *Mu'alaqat* (plural of *mu'alaqa*, literally, "hung") are the most famous Arabic poems hung in ancient times on the wall of al Ka'ba.
- 122 Stanislav Segert, *A Basic Grammar of Ugaritic Language*, (1985).
- 123 www.lilinahbiti-anat.com
- 124 *Li'yanite* is the local dialect of the oasis of al-'Ula (ancient Dedan) that had its own king in the 6th/5th century BC. See Lipinski, p. 74.
- 125 A. F. L. Beeston, "Nemara and Faw", *Bulletin Of the School Of Oriental and African Studies*, 1979, Volume 42, pp. 1-6.
- 126 Michael Everson and Daniel Jacob, *Towards a proposal to encode the Old South Arabian script in the SMP of the UCS*, 2007-09-10.
- 127 See a general "roundup" of old South Arabian at Wikipedia "South Arabian alphabet" and related links.
- 128 Janet C. E. Watson, *The Phonology and Morphology of Arabic*, (2002), pp.1- 5.
- 129 *Ibid.*, p. 3, quoting Lipinski 1997; 73-4.
- 130 A. I. Ghabban, *Naqsh Zuhayr: Aqdam Naqsh Islāmī, Arabia*, 2003, Volume I, pp. 293-342.
- 131 Samples can be viewed at: Islamicawareness.org + *The Arabic Papyrus*
- 132 *Eminent Orientalists*, Asian Educational Services 1992, p. 24.
- 133 1911 Edition of the *Encyclopaedia Britannica* – Numeral.
- 134 "The nine *ahruf* (التسعة الأحراف) (*Tarikh*, Vol. I, p. 84).
- 135 قال البيهقي: يحتل أن يكون مراده بالتحريك الإشارة لا تكرر تحريكها، حتى لا يعارض حديث ابن الزبير. وموضع الإشارة عند قوله: لا إله إلا الله، لما رواه البيهقي من فعل النبي صلى الله عليه وسلم: وينوي بالإشارة التوحيد والإخلاص فيه؛ فيكون جماعاً في التوحيد بين الفعل والقول والاعتقاد، ولذلك { نهى النبي صلى الله عليه وسلم عن الإشارة بالأصبعين وقال: أحد أحد لمن رآه يشير بأصبعيه!.
- 136 *Sunan Abi Dawood*, Hadith No. 820.
- 137 هذه وحلقٌ بأصبعه الإبهام والتي تليها وعدٌ عَشْرًا أي جعل إصبعيه كالحلقة، وعدُّ العشرة: من مواضع الحساب، وهو أن يجعل رأس إصبعه السبابة في وسط إصبعه الإبهام ويُعْطِلُها كالحلقة.
- 138 Hans Wehr, *A Dictionary of Modern Written Arabic*, ed. J Milton Cowan, (Beirut, London 1974), p. 518.
- 139 *Sahih al-Bukhari*, Vol. 5, p. 51. See also an interesting discussion about the meaning of these two months in Irfan Mohammad Hammour, *Seasons and Time Reckoning by Arabs before Islam*, (Rihab, Beirut, 2000), pp. 41-45.
- 140 Al-Mas'udi (*Murooj al-Dhahab*, Vol. 2, p. 188) says, "Arabs named the month *Safar* because townships were emptied when the population went out for war."
- 141 *Lisan al-Arab*, Vol. IV, pp. 462-463.
- 142 *Taj al-Arous*, Vol. XII, p. 331. The line is: لقد نهيت بني ذبيان عن أقر وعن تربيعهم في كل أصفار
- 143 See also his *Diwan* (Anthology), p. 50.
- 144 Tash Kabri, Vol. I, p. 375.
- 145 Ibn Majah, *al-Sunan*, Vol. III, p. 331.
- 146 Karl Faulmann, *Das Buch der Schrift*, (Wien 1880).
- 147 Jérôme Peignot, *Du chiffre*, (Paris 1982), Ed. Jacque Damase, p. 22.
- 148 والمُسْتَنْدُ: خط لحمير مخالف لخطنا هذا، كانوا يكتبونه أيام ملكهم فيما بينهم، قال أبو حاتم: هو في أيديهم إلى اليوم باليمن. وفي حديث عبد الملك: أن حجراً وُجِدَ عليه كتاب بالمسند؛ قال: هي كتابة قديمة، وقيل: هو خط حمير؛ قال أبو العباس: المُسْتَنْدُ كلام أولاد شيب. (فعل سندا).
- Ibn Khaldun, (Chapter 30 of al-Muqaddimah), agrees that the origin of the Arabic script is from Himyar.
- 149 When a word ends with "a", a soft *h* is added. It is therefore correct to write this word '*ashra* or '*ashrah*.
- التعشيرُ زيادة وتماّم. وفي الحديث: تسعةُ أعشراء الرزق في التجارة وجزءٌ منها في السبائب؛ أراد تسعةُ أعشراء الرزق.
- 150 هذه وحلقٌ بأصبعه الإبهام والتي تليها وعدٌ عَشْرًا أي جعل إصبعيه كالحلقة، وعدُّ العشرة: من مواضع الحساب، وهو أن يجعل رأس إصبعه السبابة في وسط إصبعه الإبهام ويُعْطِلُها كالحلقة.
- 152 Universal Multiple-Octet Coded Character Set, International Organization for Standardization, ISO/IEC JTC1/SC2/WG2 N3296R, (2007-09-10).
- 153 والعشرون: عشرة مضافة إلى مثلها وضبعت على لفظ الجمع وكسروا أولها لعة.
- 154 Narendra Kumar, *Science in Ancient India*, p. 90.
- 155 Johathan Slocum, *Old English Online, lesson 5, Linguistics Research Centre*, the University of Texas at Austin.
- 156 Ibn al-Wahshia is considered a *controversial* writer, probably unjustly. Philip Hitti (History of the Arabs, p. 352) described ibn al-Wahshiah's *al-Filahah al-Nabatiyah* as 'spurious' but *Shawq al-Mustaham* was one of the most sought after books in the world in the late 18th and the 19th centuries as it was believed in contained keys to deciphering hieroglyphics. During Bonaparte's invasion of Egypt in 1798, his *savans* (learned men) tried and failed to find a copy of *Shawq al-Mustaham*, a collection of various ancient alphabets. A copy was later found and published in English in 1806 by the Austrian scholar Joseph Hammer. Okasha El Daly, a London-based Egyptologist who teaches at Birkbeck College, told the London *Observer* that ibn al-Wahshiah deciphered hieroglyphics 800 years before Jean François Champollion, a student of the French orientalist Silvestre de Sacy, who announced his famous breakthrough in 1822 when he realised from studying the Rosetta stone that the way to decipher hieroglyphics is by reading the ancient language not as symbols but as a phonetic script. De Sacy had tried to unlock the hieroglyphic code using Ibn al-Wahshia's list of alphabet but failed. It is almost certain that Champollion studied *Shawq al-Mustaham* but what benefit it yielded is not known. Said El Daly, "I was convinced that Western scholars were not the first, and I have found evidence that shows Arabian scholars broke the code a thousand years ago." See article by Robin McKie, science editor, the *Observer*, October 3, 2004.

- 157 *The history of Herodotus*, Translator and commentator George Rawlinson, (j. Murray 1862), Vol. II, chap. 36, p. 51.
- 158 *Arithmetic, XI. METHODS OF CALCULATION*.
- 159 John. R. Henderson, *Coins of Haidar Ali and Tippu Sultan*, (Madras 1921), p. 11.
- 160 The authors of *Indian Renaissance* quoted James Mill (*History of British India*) who gave an eyewitness account of the carnage by troops under the command of Matthew's troops. John Charles Sheen, a Scottish ensign who was present, is more direct: 'the slaughter at Anantapur Fort was indiscriminate and wanton... All the inhabitant were put to death and their bodies thrown into tanks in the fort. Even the women were not spared... Four hundred beautiful women, all bleeding with wounds from the bayonet, and either dead or expiring in each other's arms, while the common soldiers, casting off all obedience to their officers, were stripping them of their jewels and committing every outrage on their bodies. Many of the women rather than be torn from their relatives, threw themselves into a large tank and were drowned.' Hermione De Almeida, George Gilpin, *Indian Renaissance: British Romantic Art and the Prospect of India*, (2005), pp. 36-37.
- 161 G. M. Wickens, *Arabic Grammar: A First Workbook*, (Cambridge University press 1980), p. 98. The simplest rules governing gender polarity are to be found in *Lisan al-Arab* under 'ashr (عشر).
- 162 G. M. Wickens, (University of Toronto), *What the West Borrowed from the Middle East*, pp. 120-126, in, *Introduction to Islamic civilisation*, Roger Savory, ed., (Cambridge University Press 1976), p. 122.
- 163 Hamdan Abdul Majid al-Kubaisi, *The Markets of Baghdad until the Beginning of the Buaihies*, (Baghdad 1979), p. -277.
- 164 Bu-Ali Yassin, *Khair Al-Zad min Hikayat Scheherazade*, (Damascus 1986), p. 307
- 165 *The Seven Mansions*, p. 150.
- 166 *Al-Jabr Was al-Muqabalah*, Folio 9.
- 167 Abu Haiyan al-Tawhidi, *al-Imta' wa al-Mo'anasa*, (Beirut), Vol. I., p. 96.
- 168 *Moroqj Al-Dhahab*, Vol. III, p. 179.
- 169 In: Abdul Qadir al-Halaq al-Halabi, *Fadhl al-Khitab fi Ilm al-Hisab*, folio 2.
- 170 Ali Abdulla al-Daffa'a, *The Contribution of Muslim Scientists to Mathematics*, trs. Jalal Shawqi, (Dar al-Sharq, Beirut, 1981), p. 45.
- 171 Al-Biruni, *Tahdid Nihayat al-Amakin li Tashih Masafat al-Masakin* ("the determination of the borders of places to correct the distances between residences"), p. 25.
- 172 Ahmad bin al-Hassan al-Hasib al-Massisi, *Al Jabr wa al-Muqabalah*, folio 10.
- 173 Charles Henry Timperley, *A Dictionary of Printers and Printing: With the Progress of Literature*, (1842), p. 213.
- 174 In *The Nothing That Is: a Natural History of Zero*, (Penguin, 1999), R. Kaplan says William of Malmesbury called Arabic mathematical manuscripts "dangerous Saracen magic".
- 175 See the argument in *War and Plenty*, p. 78.
- 176 For more details, Hitti, p. 451, 604.
- 177 Gian Luigi Scarfiotti and Paul Lunde, *Muslim Sicily*, Saudi Aramco World, December 1978.
- 178 Hitti, pp. 605-606.
- 179 Scarfiotti & Lunde.
- 180 Professor Beniamino Inserra, *Emperor Frederick II*, Best of Sicily Magazine, 2002.
- 181 *The Mafia*, Best of Sicily Magazine, undated article.
- 182 www.islamawareness.net/Europe/Italy/renaissance.html
- 183 *The Kingdom in the Sun 1130-1194*, (Longman, 1970).
- 184 *England and Sicily in the 12th Century*: The English Historical Review: Vol. XXVII (1911), pp. 433-447; 641-665.
- 185 Robert Briffault, *The Making of Humanity*, (London 1919), p. 212.
- 186 Published by the Foundation for Science, Technology and Civilisation, November 2004.
- 187 In the *Dialogue concerning the Exchequer*, Book I, chap. I, written probably in the time of Henry II, the Exchequer is described as "a square board, of about ten feet in length and five in breadth, fixed up in the shape of a table, for people to sit round, with a border of about four inches high all round it, to prevent anything falling off, and a cloth, bought in Easter term, marked with black squares, distant from each other about a foot or a span, laid upon the Upper Exchequer, and was like a chess-board. In the squares, counters were regularly placed."
- 188 Roshdi Rashed and Regis Morelon, *Encyclopedia of the History of Arabic Science*, (Routledge 1996), p. 543.
- 189 J. Phillips, *The Fourth Crusade and the Sack of Constantinople*, Intro. XIII.
- 190 William Sullivan, *Historical Causes and Effects: From the Fall of the Roman Empire, 476, to the Reformation 1517*, (Boston 1838), p. 462.
- 191 Benjamin Arbel, David Jacoby, *Intercultural Contacts in the Medieval Mediterranean*, (1996), p. 284.
- 192 *Companion Encyclopedia of the History and Philosophy of the Mathematical Sciences*, (JHU Press, 2002), p. 202.
- 193 The historian 'Ubayd Allah ibn 'Abd Allah, better known as ibn Khurradadhbih (c. 820-912) provides an interesting passage about a group of Jewish international traders known as *Radhaniyya*, believed to be from the "land of the Franks," (the Carolingian Empire) stationed in Venice: "These merchants speak Arabic, Persian, Greek, Latin, Frankish, Spanish and Slavic. They travel from West to East and from East to West, sometimes by land, sometimes by sea. From the West they bring eunuchs, female slaves, young boys, brocades, beaver, marten and other furs and swords. They set sail from the land of the Franks, on the Western Sea [the Mediterranean], and make for al-Farama [on the Isthmus of Suez]. There they transfer their merchandise to camels and go overland to [the Red Sea port of] Qulzum, a distance of 25 farsakhs. From there they set sail on the [Red Sea] and make for al-Jar and Jiddah. Then they sail to Sind, India and China. On their return from China, they bring musk, aloeswood, camphor, cinnamon and other products of the East. They return to Qulzum, then back to al-Farama, where they take ship once again on the [Mediterranean] Sea. Some sail to Constantinople to sell their merchandise to the Greeks; others go to the capital of the king of the Franks to sell their goods. Occasionally these Jewish merchants sail from the land of the Franks to Antioch. From there they go to al-Jabiyah, three days overland. There they embark on the Euphrates, making for Baghdad. Then they go down the Tigris to al-Ubulla. From al-Ubulla they set sail for Oman, Sind, India and China." From an article, *The Seas of Sindbad* by Paul Lunde published by Saudi Aramco World (July-August 2005).
- 194 The word "average", attested since 1491, is "financial loss incurred through damage to goods in transit," from O. Fr. *avarie*, from It. *avarìa*, a word from 12th century Mediterranean maritime trade. Sometimes traced to Arabic 'arwariya "damaged merchandise" (Online etymology dictionary). 'Arwariya does not exist in Arabic. The closest to it is 'awra, "spoil" or cause a "defect". A plausible origin is the Arabic verb 'abra'a (أبرأ) which means to clear a liability as a result of debt incurred or for a final settlement of a claim. The verb is usually associated with *zimmah* (ذمة) as in 'abra'a al-zimma, to clear a liability or a demand arising from any number cases by a payment or dis-association of responsibility.
- 195 Thomas F. Glick, Steven John Livesey, Faith Wallis, *Medieval Science, Technology, and Medicine: An Encyclopedia*, (Routledge 2005), p. 47
- 196 Harold Joseph Berman, *Law and Revolution II*, (Harvard University Press 2003), p. 162.
- 197 Thomas R. DeGregori, *Origins of the Organic Agriculture Debate*, (2003), p. 37.
- 198 Marshall Cavendish Corporation, *Exploring the Middle Ages*, (2006), p. 497.
- 199 Dick Teresi, *Lost Discoveries*, (2002), p. 25.
- 200 Marshall Cavendish, p. 497.
- 201 The typical historiography concerning Islam is powerfully expressed by Robert Briffault: "The fact has been set forth again and again. But it has been nevertheless stubbornly ignored and persistently minimized. The debt of Europe to the 'heathen dog' could, of course, find no place in the scheme of Christian history, and the garbled falsification has imposed itself on all subsequent conceptions. Even Gibbon treated Islam depreciatingly, an instance of the power of conventional tradition upon its keenest opponents. Until the last century there did not even exist anything approaching accurate knowledge of Saracenic history and culture. 'Those accounts of Mahomet and Islam which were published in Europe before the beginning of the nineteenth century are now to be regarded simply as literary curiosities' (Professor Bevan, Cambridge Medieval History). At the present day, when wider and more exact knowledge is becoming accessible, scarcely any history of the Middle Ages gives Islamic culture more than an off-hand and patronizing recognition. The history of the rebirth of Europe from barbarism is constantly being written without any reference whatsoever, except to mention "the triumphs of the Cross over the Crescent," and "the reclamation of Spain from the Moorish yoke," to the influence of Arab civilization— the history of the Prince of Denmark without Hamlet. Dr. Osborn Taylor has even achieved the feat of writing two large volumes on the development of The Medieval Mind without betraying by a hint the existence of Muhammadan culture." *The making of humanity*, p. 189.
- 202 See an argument on this controversial issue in *Power and Plenty*, pp. 353-354.
- 203 Walter William Rouse Ball, *A Short Account of the History of Mathematics*, (1960 a reprint of the 1908 edition), p. 187.
- 204 Florian Cajori, *A History of Mathematical Notations*, (Courier Dover, 1993), p. 46.
- 205 G. F. Hill, *the Development of Arabic Numerals in Europe* (Oxford, 1915).
- 206 *Bulletin of the American Mathematical Society*, Vol. 22, No. 4, (1916), pp. 192-194.
- 207 Arab scholars in the 10th century AD were aware of the "Hindi" safr. According to al-Khwarizmi al-Katib, "*Tarqeen* (ترقيين) is a line inserted in dates or in an application if an entry is vacant. The purpose of this line is to maintain the order of the text. It is akin to the safr (zero) in the calculations of al-Hind and the Jumal alphanumerals. The word *tarqeen* is derived from 'raqan', a Nabataean word meaning *empty*." *Mafatih al-Oloum*, Section 4, Chap.1.
- يكون الترتيب محفوظاً به وهو بمنزلة الخوارزمي الكاتب: الترقيين: خط يخط في التاريخ أو العريضة إذا خلا باب من السطر لكي رقان وهي بالنبطية الفارغ. الصفر في حساب الهند وحساب الجمل واشتقاقه من
- In *Lisan al-Arab*, "In the calculation of Hind, a safr is a circle in a *beit* (a line of number clusters since a poetry *beit* is a line of poetry) that eliminates its calculation."
- والصفر في حساب الهند: هو الدائرة في البيت يقنى حسابيه.
- The purpose of such a circle is to indicate that such a cluster should be ignored in computing the grand total in an arithmetic operation. It is connected with calculating on dust boards (Hindi calculus). However, "Hindi" (from Arabic *Hind* هند) should not be understood to mean present day India exclusively but any region between the eastern borders of present day Iran and China, and it comprises most of Central Asia.
- 208 Ibrahim Al-Qadi, "*The Origins of Cryptology: The Arab contributions*", *Cryptology*, 16, (2), (April 1992) pp. 97–126; *Cryptography and Data Security: Cryptographic Properties of Arabic*, proceedings of the Third Saudi Engineering Conference in Riyadh, Saudi Arabia: Nov 24-27, Vol 2:910-921, 1991. Mohammad al-Marayati, a regional adviser for the United Nations on Science and Technology, explained in a lecture in Saudi Arabia in 1422 AH (2001) that cryptology is an ancient tradition that was made a science by a number of Arab and Muslim scholars. In addition to cryptography, other types of this science include *transposition*, *substitution* and the *normal code*. In addition to Arabic numerals, al-Jumal alphanumeric system, dictionaries, chess squares, statistics and other sources were used. The extraction of meaning is known simply as *de cyphering* or *cryptanalysis*. Fifteen manuscripts on the subject have been identi-

fied. Al-Marayati quotes Leon Battista Alberti (1404-1472), an Italian known among the first in Europe to advance *polyalphabetic substitution*, as saying in the course of describing the system that "Arabs have an original school". Alberti's major work is a treatise he called *De Cifris*.

209 Quoted by Smith and Karpinski, (p. 57) as, "Cum his novem figuris, et cum hoc signo 0, quod arabice zephirum appellatur, scribitur quilibet numerus."

210 Leo Jordan, "Materialien zur Geschichte der arabischen Zahlzeichen in Frankreich," Archiv für Kulturgeschichte, Berlin, 1905, pp. 155-195, gives the following two schemes of derivation, (1) "zefiro, zeviro, zeiro, zero," (2) "zefiro, zefro, zevro, zero."

211 In the 1484 edition, Borghi uses the form "çefiro: ouero nulla:" while in the 1488 edition he uses "zefiro: ouero nulla," and in the 1540 edition, f. 3, appears "Chiamata zero, ouero nulla."

212 Savonne (1563, 1751 ed., f. 1): "Une ansi formee (o) qui s'appelle nulle, & entre marchans zero," showing the influence of Italian names on French mercantile customs. Trenchant (Lyons, 1566, 1578 ed., p. 12) also says: "La derniere qui s'apele nulle, ou zero," but Champenois, his contemporary, writing in Paris in 1577 (although the work was not published until 1578), uses "cypher," the Italian influence showing itself less in this center of university culture than in the commercial atmosphere of Lyons.

213 Grammateus, in his *Algorismus de integris* (Erfurt, 1523, f. A-2), speaking of the nine significant figures, remarks: "autem superadditur decima figura circularis ut 0 existens que ratione sua nihil significat." Noviomagus (*De Numeris libri II*, Paris, 1539, chap. xvi, "De notis numerorum, quas zyphras vocant") calls it "circularis nota, quam ex his solam, alij sipheram, Georgius Valla zyphram."

214 Taki-iddin Abi Bakr bin Ahmad bin Qadi Shahba al-Asadi al-Dimashqi, *Tarikh ibn Qadi Shahba*, (Ed., Adnan Darweish), Vol. II, p. 541.

215 From a manuscript of the date 1570 by a Mr. Davies, *Key to Hutton's Course*, p. 17 cited by Bowring, p. 36.

216 *Winter's Tale*, Act IV. Scene 3.

217 George Peacock, *A Treatise on Algebra*, (1842) Vol. 1, p. 78.

218 I. Taylor, *The Alphabet*, (London 1883), Vol. II, p. 263.

219 See the example in *al-Manazil al-Sab'* ("the seven mansions"), p. 151.

220 *Al-Fusul fi al-Hisab al-Hindi*, p. 317.

221 David A. King, *The cyphers of the Monks: A Forgotten Number-notation of the Middle Ages*, (Franz Steiner Verlag 2001), P. 17.

222 Pihan quoting *Appendice aux Rudiments de la langue hindoustanie*, M. Garcin de Tassy, (Paris 1833), p. 48.

223 Power and Plenty, (p. 60), quoting historian Pedro Chaleta's *An approximate picture of the economy of al-Andalus*. In *The Legacy of Muslim Spain, Volume 2* (ed. Salma Khadra al-Jayyusi), Leiden: Brill (1994).

224 "On the night of the eighteenth of Thi-l-Qu'ida, the fifteenth of Mars...", *Rihlat Ibn Jubair*, (Beirut), p. 10.

225 David A. King, *The cyphers of the Monks: A Forgotten Number-notation of the Middle Ages*, (Franz Steiner Verlag 2001), P. 47.

226 "ولو اصطلحت مع نفسك على تبديلها أو عكسها لجاز وجه العمل على حاله لا يتبدل."

227 This chapter is extracted from a forthcoming book by the author on the history of the appropriation of the Arabic numeric system.

228 George Peacock, *A Treatise on Algebra*, (1842) Vol. 1, pp. 78-79

229 *Companion Encyclopedia of the History and Philosophy of the Mathematical Sciences*, (JHU Press, 2002), pp. 200-201.

230 See a number of other references to the same effect cited by Smith and Karpinski, pp. 56-58, including Steinschneider, *Bibliotheca Mathematica*, 1893, p. 69, and G. Wertheim, *Die Arithmetik des Elia Misrahi*, Programm, Frankfurt, 1893.

231 *Eminent Orientalists*, (Asian Educational Services 1992), p. 24.

232 Lord Teignmouth, *the Works of Sir William Jones. With a Life of the Author*, (1807), Vol. III, p. 35.

233 *Asiatic Journal* (New Series), VOL. 2. No. 5. May-August, 1830, pp. 137-138.

234 *Eminent Orientalists*, p.57.

235 *Eminent Orientalists*, p.48.

236 H. T. Colebrooke, *On the Indian and Arabian Divisions of the Zodiack*, *Researches or, Transactions of the Asiatic Society* (Calcutta 1809) Vol. IX, pp. 323-376.

237 Probably Arabic *tariqa*, "method".

* Colebrooke's footnote on the same page (376) is this: "Bhascara expressly said: 'By ancient astronomers, the purpose of the science is declared to be judicial astrology; and that, indeed, depends on the influence of configurations; and these, on the apparent places of the planets.'"

238 Probably from Arabic *Yunan* designating Greeks.

239 *Alberuni's India*, tr., Edward Sachau, II, p. 81.

240 Ali Bin Yussuf Abu al-Hassan Jamal U-Din Al-Qifti, *Ikhbar al-Ulama bi-Akhbar al-Hukama*, (Cairo 1326 AH/1908), p. 185.

241 Al-Qifti, pp. 177-178.

242 Al-Beiruni's Arabic statement (II, p. 15) is this:

الادوار مستفادة عن الرجل الهندي الذي كان في جملة وفد السند على المنصور في سنة "وفي زيج الفزاري ويعقوب بن طارق تلك خلافتا لست اعرف سببها ، اهو من نقل الرجلين؟ ام هو اربع وخمسين ومائة للهجرة ، واذا قسنا بينها وبين ما عليه الهند وجدنا بينهما من املاء الهندي؟"

243 *Essays*, Vol. II., p. 505.

244 *The Asiatic Journal and Monthly Register for British India and its Dependencies*, 1826, p. 208.

245 These are the famous Persian fables known as *Calila wa Dumnah*.

246 David Eugene Smith in, *History of Mathematics*, Vol. II, pp. 64-65.

247 This is confirmed by E. Glenn Hinson in *The Church Triumphant: A History of Christianity Up to 1300*, who on page 175 says, "Theophilus the Indian was sent to Southern Arabia and Ethiopia then he was sent to other parts of India but again this may have meant Southern Arabia."

248 Procopius of Caesarea, *Buildings*, (Loeb trans.), 6.1.6.

249 Philip Mayerson, *A Confusion of Indias: Asian India and African India in the Byzantine Sources*, *Journal of the American Oriental Society*, Vol. 113, No. 2 (Apr-Jun., 1993), pp.169-174.

250 E. H. Warmington, *The Commerce Between the Roman Empire and India*, (London 1974), pp. 139-40.

251 See *Hind province* in al-Idrissi's *Geography*, vol. I, pp. 166-190. (Arabic).

252 Barthélemy d'Herbelot de Molainville, *Bibliothèque orientale*, (Completed 1697), P. 504.

253 Al-Yaqubi, *Mushakalat al-Nas Li Zamanhim*, Ed., William Millward, (The New Book Publishing House, Beirut 1962), p. 6.

254 Al-Yaqubi, *Tarikh*, Vol. I, p. 84.

255 See for example:

http://www.islamic-awareness.org/History/Islam/Dome_Of_The_Rock/hajjdome.html

256 Names of two famous horses. See comments on a poem by Qais Bin Zuhair in the selections from *al-Hamasa* by Abu Tamam, (Damascus 1397/1977), p.143. See also *Lisan al-Arab* (= عشر): "Banu 'ashra' are a group from Bani Fazarah."

257 Bhikhu C. Parekh, *Colonialism, Tradition, and Reform: An Analysis of Gandhi's Political Discourse*, (Sage 1999), p. 46-47.

258 Aijaz Ahmad, *In Theory: Nations, Classes, Literature*, p.260